Consolidated environmental impact assessment and single environmental permit for the battery factory planned to be built by Eve Power Hungary Kft. in Debrecen
your request for

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Statement

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This documentation is the unofficial English translation of the Hungarian original, in case of any discrepancies, the Hungarian version thereof shall be regarded as binding.

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1. Introduction

Eve Power Hungary Kft. (hereinafter referred to as the Licensee) is planning to construct a new battery cell manufacturing site at the Debrecen municipality of Debrecen, Hungary. 0237/405, located along the BMW Boulevard. The site is located in Debrecen, in the North-West Economic Belt.

The investment is aimed at developing a battery cell factory that will supply the vehicle manufacturer with the cells and battery packs needed for electric vehicles at its neighbouring BMW car plant.

The main production process takes place in the three main buildings. The three production buildings are interconnected, but structurally separate buildings (EL, AS, FO). The other buildings on the site are used for the storage of raw materials and finished products, the storage of waste from the technology, the testing of finished products and other service buildings.

Accordingly, the site is planned to include several buildings with manufacturing, storage/storage and testing functions, porter buildings, an electrical substation and parking areas, as well as internal access roads. Eve Power Hungary Kft.'s investment in Hungary will create around 1,000 new jobs to serve the manufacturing and facilities management processes, of which one fifth will be office workers.

The classification of the planned establishment or activity according to the Government Decree 314/2005 (XII. 25.) are given below (values for capacity based on reaching full capacity):

- Government Decree 314/2005 (XII. 25.), Annex 1, point 27a:
  - **Manufacture of batteries**, including the manufacture of battery components - anode, cathode, electrolyte, lead-acid batteries and separator foil, and the assembly of finished sealed battery cells into modules or modules into battery packs **without dimensional bonding**. **Relevant**
- Government Decree 314/2005 (XII. 25.), Annex 1, point 51a:
  - **Battery**, including **pre-treatment** and recycling of battery components - anode, cathode, electrolyte, pre-treatment and recycling of lead-acidand its components - anode, cathode, electrolyte, without size limitation. **Relevant**
- Government Decree 314/2005 (XII. 25.), Annex 2, point 1.1:
  - Combustion of fuels in installations with a total rated thermal input of 50 MWth or more. **Relevant**
- Government Decree 314/2005 (XII. 25.), Annex 2, point 12:
  - Surface treatment of materials, articles or products with organic solvents, in particular for surface treatment, printing, coating, degreasing, waterproofing, polishing, painting, cleaning or impregnating, with a solvent consumption capacity exceeding 150 kg/hour or 200 tonnes/year. **The planned annual solvent consumption is 16 612,2 tonnes.** **Relevant**
- Government Decree 314/2005 (XII. 25.), Annex 3, point 65:

- Plant for surface treatment of metals and plastics by electrolytic or chemical processes from 20 000 m^2/year of surface treatment: **the surface treatment of anode or cathode foil in the installation is not carried out by electrolytic or chemical processes, so this point is not relevant.**

- Government Decree 314/2005 (XII. 25.), Annex 3, point 72:
  - Installations for the production of thermal energy (steam and hot water, if not included in Annex 1) with an output of 50 MW or more. **Relevant**

According to the above, the planned facility is subject to the provisions of Section 1 (3) of Paragraph 1 of Government Decree 314/2005 (XII. 25.)

(b) requires an environmental impact assessment and a single environmental permit procedure. The permit applicant wishes to make use of the option provided for in Article 1(4) of Government Decree 314/2005 (XII. 25.) and requests that the procedures be conducted as a single procedure.

This document is an application for a Consolidated Environmental Impact Assessment and a Consolidated Environmental Permit for the proposed activity.

The applicant wishes to make use of the possibility of trial operation in accordance with the provisions of Article 22 (1) of Government Decree 314/2005 (XII. 25.). The duration of the trial run is 6 months, as specified in § 22.
§ § (2).

The planned development qualifies as an investment of major national economic importance on the basis of Government Decree 58/2018 (26.III.) on the declaration of administrative authority cases of national economic importance in the North-West Economic Belt outside the City of Debrecen, in the North-West Economic Belt, in connection with the establishment of an industrial site and job-creating investments in the area.

2. Basic data

The basic information on the environmental and single permit procedure is set out below together.

2.1. Data for the facility under review

Name of applicant	Eve Power Hungary Kft.
Licence applicant's registered office	4025 Debrecen, Barna utca 23.
Company registration number of the applicant	09-09-035942
Tax number of the applicant	27873926-2-09
Licence applicant SSA number	27873926-2720-113-01
KÜJ number	104244683
Name of the manager authorised to represent the company	Liang Rongbin
Parcel number of the planning area	Debrecen, 0237/405
Property owner	Licence applicant
Statistical identification number of the municipality	15130
Site area	450 000 m^2
Establishment BTI number	103167623
Central EOV coordinates	EOV Y: 835619 EOV X: 251450
Scope of activity according to the company's registration document	2720'08 Manufacture of batteries and dry cells
The planned activities	Production of LiNiCoMn-based battery cells with a capacity of 30 GWh/year
Planned number of staff	1019 (179 clerical and 840 manual staff)
Work schedule	4 shifts continuous working hours
IPPC codes	101.02 107.01
NOSE P codes of the proposed activity	101.02 - Burning processes> 50 and< 300 MW 107.02 - Machinery and fabricated metal products; surface treatment of materials, articles or products; organic surface treatment of materials solvents, in particular for surface treatment, printing, coating, degreasing, waterproofing, polishing, painting, cleaning or impregnating, with a solvent consumption capacity exceeding 150 kg per hour or 200 tonnes per year.
Capacity related to the proposed activity	16 612,2 tonnes/year*
Production capacity of the installation	Battery cell production with a capacity of 30 GWh/year (250 905 600 cells/year)
Number of working days per year	330
Parking number	719 parking spaces and 11 parking spaces: 730 parking spaces
Reservation	203 843,35 m^2

** The figure of 16612.2 tonnes/year referred to is the annual quantity of organic solvents intended to be used for the surface treatment of materials.*

The battery manufacturing activity and related activities planned for the site fall into the following activities:

- TEÁOR 2720 '08 - Manufacture of batteries and dry cells
    - The main activity the site, details of which are given in Chapter 4.
- TEÁOR 2561 '08 - Metal surface treatment
    - Sub-activities include surface treatment of anode foil and cleaning of battery surfaces with alcohol wipes
- TEÁOR 3530 '08 - Steam and air conditioning supply
    - The sub-activities include the supply of steam to technology and engineering systems and the air conditioning of interiors.

2.2. Available licences

A preliminary investigation was carried out by the competent Hajdú-Bihar County Government Office, Department of Environment and Nature Protection, on the establishment and provision of infrastructure for the Debrecen North-West Economic Belt, which was concluded with the decision issued under the registration number HB-03/KTF/00117- 2/2019.

Based on the above-mentioned preliminary investigation, the application for a building permit for the landscaping and deep foundation of a battery cell manufacturing plant planned for the property at 0237/405, Debrecen, was submitted by Eve Power Hungary Kft., for which the building permit was issued under file number HB/ETDR-19/4400-14/2023 ÉTDR.

Also based on the above-mentioned preliminary examination, the application of Eve Power Hungary Kft. for a modified building permit for the landscaping and deep foundations of a battery cell manufacturing plant planned for the property at 0237/405, Debrecen, was submitted, for which the building permit was issued under case number HB/ETDR-19/1825-18/2024.

The environmental impacts of the battery production activity have not been assessed in the above-mentioned permitting processes, and there is no relevant environmental permit available. It is necessary to obtain a permit in the procedure initiated by this dossier.

The general provisions of the highlighting Government Decree No. 58/2018 (III.26.) "on the declaration of administrative authority matters related to the establishment of an industrial site and job creation investments in the North-West Economic Belt outside the county city of Debrecen as a matter of national economic priority", as well as the provisions of the highlighting Decree listed in Annex 1 to the present investment area are taken into account in the planning.

2.3. Use of the property concerned by the planning, ownership

planned property (HRSZ 0237/405) is part of the outskirts of Debrecen. It is classified by the Land Registry as a designated investment area. The property is owned by the Licensee, the title deed and a copy of the map are attached in Annexes 1.3 and 1.4.

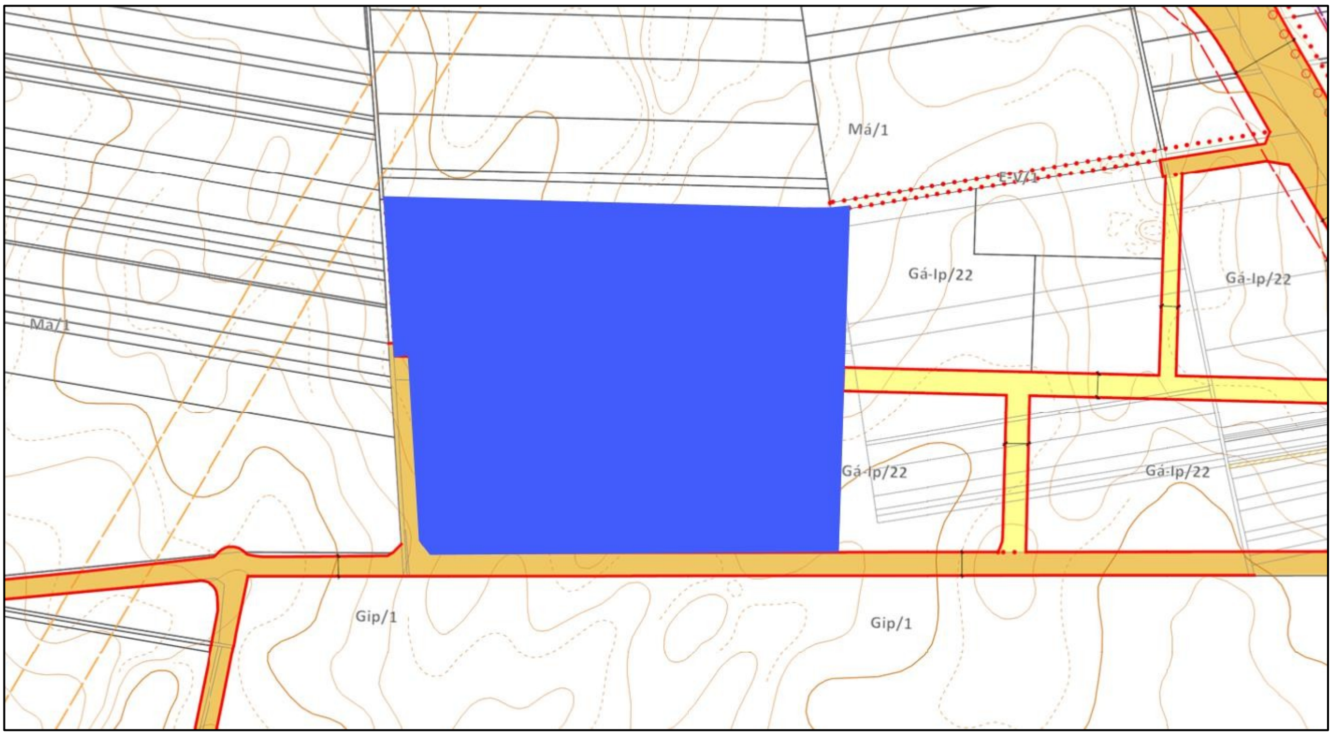
2.3.1. A installation location delimitation on a map, marked a installation location existing or planned land uses in the vicinity

Properties in the planning area and its surroundings in a town and country planning plan is given in the table or map below.

Table 1: Regulatory plan classification of the area surrounding the installation

Directions to	Function, classification
North to north	Má area
in K-direction	Gá-Ip area
in the D direction	Thanks, then Gip area
West to west	Má and Köu area

- Gip: Industrial sites
- Gá-Ip: General economic areas related to industrial activity
- Köu: Road areas
- Má: General agricultural areas



1. Figure 1: Regulatory plan environment of the planning area (Planning area marked with blue polygon)

The EOV coordinates of the polygon containing the facility are given in the table below.

2. Table 1 EOV coordinates of the planning area containing the planned installation

Serial number	EOV Y	EOV X
1	835961,9	251768,2
2	835188,9	251763,2
3	835214,4	251495,7
4	835241,0	251495,9

5	835244,8	251455,9
Serial number	**EOV Y**	**EOV X**
6	835271,1	251175,5
7	835287,3	251159,6
8	835987,9	251182,5
9	835987,9	251773,2

3. Main characteristics of the proposed activity and establishment

3.1. Planned volume of activity

3.1.1. Technical characteristics of the planned facility

The industrial area (Debrecen North-West Economic Belt) is located about 5 km west of the city of Debrecen. The site of the planned Eve Power Hungary Kft. Battery Factory can currently be accessed from the south-west, but during the project the Licensee will build a road link from the south towards the recently completed BMW Boulevard. An expressway running along the eastern side of the planning area will be completed by the end of 2024, which is another possible point of access for secondary plant logistics and VIP/employee access. A number of bus stops will be provided along the BMW Boulevard to ensure public transport. A bus stop will also be located on the northern section of BMW Boulevard, in the vicinity of the southern road junction planned by Eve Power Hungary Kft. At the south-west corner of the site, an access point will also be constructed by Eve Power Hungary Kft. to provide access to the western employee car park.

The planning area is planned to include 719 external car parking spaces, of which 16 are accessible and 9 are equipped with electric car chargers. It is also planned to provide 11 truck parking spaces and 192 bicycle parking spaces.

A detailed description of the planned buildings is given in chapter 3.2. According to the Regulatory Plan of the City of Debrecen, the area concerned by the planning is zoned Gá-Ip/22. The compliance of the planned facility with the zoning regulations is presented below.

- Maximum permissible built-up area 60 %
- Planned built-up floor area 136 849,68 m^2
- Planned built-up area 30,41 %< 60,0 %
- Maximum allowed floor area ratio 2,00
- Planned gross floor area 211 707,27 m^2
- Planned floor area indicator 0,47< 2,00
- Minimum green area 20 % (90.000 m^2)
- Planned green space 246.156,65 m^2
- Green space indicator (under planning): 54.70 %> 20 %
- Maximum building height 30,0 m
    - AS-EL-FO Building height 21,72 m< 30,0 m
    - RM-MU building height 17,90 m< 30,0 m
    - PS building height 18,25 m< 30,0 m
    - SO building height 21,59 m< 30,0 m
    - DW building height 6,07 m< 30,0 m
    - BS building height 9,31 m< 30,0 m
    - BD building height 5,55 m< 30,0 m
    - BF building height 6,44 m< 30,0 m
    - BA building height 7,17 m< 30,0 m
    - LO building height 4,83 m< 30,0 m

- o EM building height 4,19 m< 30,0 m
- o ET building height 7,49 m< 30,0 m
- o NT building height 4,65 m< 30,0 m
- o NC building height 5,67 m< 30,0 m
- o SU building height 7,86 m< 30,0 m

Other regulations based on the Decree of the General Assembly of the Municipality of Debrecen Municipality of Debrecen on the Local Building Code of the City Debrecen 47/2020 (XII.28.):

- The number of planted deciduous trees shall be at least 1 for every 150 m^2 of green area calculated in accordance with the zoning regulations for each 150 m^2 of green area.
- By way of derogation from the above paragraph, if the minimum green area required for the building zone is provided by the establishment of a grassed area and at least 25% of deciduous and evergreen ground cover or shrub layer, the green area may be increased to 300 m^2, whereby the obligation to plant trees may be met by afforesting the adjoining public areas.
- The minimum amount of green area and the implementation of the specified tree planting obligation may be implemented in proportion to the total planned development of the building plots, in proportion to their total built-up area, and in a phased manner within the individual building plots created by the development of the areas affected by the construction project.
- In order to provide shade for the surface car parking areas, for every 6 surface car parking areas started, 1 large canopy tree of urban hardy species with at least two schooling cycles shall be planted adjacent to the surface car parking areas, with a minimum of 2 m^2 of productive land per tree.

3.1.2. Quantity of materials and product intended to be used in the installation

The quantities of the main materials and finished products that are planned to be used in the installation on an annual basis are given in Chapter 7.1.8.

The planned capacity of the facility when full capacity is reached:

- The total power of the combustion plants planned to be installed in the installation is 81,5 $_{MWth}$,. The nominal input power of the combustion plants planned to be used in operation at the same time is 56 $_{MWth}$. It is not feasible to connect the boilers to a point source, the individual boilers will not have capacity of more than 50 $_{MWth}$ (see chapter 7.1.3 for more details).
- The planned annual quantity of solvent (NMP) to be used for surface treatment is 16 612,2 t/year, consisting of:
    - o Quantity planned to be used for the production of cathode slurry: 10 289,4 t/year
    - o NMP content of CNT slurry: 6322.8 t/y (CNT contains 95.8% NMP. CNT is planned to be used as part of the over-treatment activity in the production of cathode-side slurry.)
- The surface area of anode and cathode foil to be surface treated in the facility at full capacity is ~ 281 832 224.2 m^2, of which:
    - o Anode: ~143 053 827,8 m^2

    - Cathode: ~138 778 396,4 m^2
- The battery cell production capacity is 30 GWh/year, which corresponds to a production of 250 905 600 battery cells/year.

Preliminary calculated utility requirements for the facility are given below:

- Natural gas: 44 352 000 m^3/year
- Electricity: 69 000 kVA
- Drinking water: 26 070 m^3/year
- Industrial dilution water: 193 086,3 m^3/year
- Greywater: 984 060 m^3/year
- Wastewater:
    - urban waste water: 22 486,2 m^3/year
    - process waste water: 441 167,1 m^3/year
        - Treated process wastewater: 66 594 m^3/year
        - Water from RO installations: 374 573,1 m^3/year
- Evaporation loss: 731 600,1 m^3/year
- Reclaimed water (for gas scrubbers): 7 656 m^3/year

The annual quantities of basic and auxiliary materials planned to be used are given in the table below for the period after full capacity has been reached.

3. Table 1: Annual quantities of materials planned to be used on site and planned storage capacity

Material name	Basic-/auxiliary material	Use	Annual used volume	Quantity in storage	H sentences	hazard classification*
Lithium Nickel Cobalt Manganese Aluminate (NCMA)	Production raw material	Production	37 582 t	1 024 974 kg	H317, H334, H351, H372, H413	K2
Lithium-nickel-cobalt-manganate (NCM)	Production raw material	Production	9 396 t	256 243,5 kg	H317, H351	K2
Conductive paste (SP)	Production raw material	Production	240 t	6 552,9 kg	-	-
N-methyl-2-pyrrolidone (NMP)	Production raw material	Production	10 289 t	168 592 kg	H315, H319, H360D, H335	K1
CNT	Production raw material	Production	6 600 t	180 000 kg	H227, H315, H319, H335, H351, H360	K1
Aluminium foil	Production raw material	Production	4 232 t	115 416,9 kg	H412	K2
Boehmite	Production raw material	Production	205 t	5 597,1 kg	-	-
Polyvinylidene fluoride (PVDF)	Production raw material	Production	576 t	15 722,1 kg	-	K1
Graphite	Production raw material	Production	26 830 t	731 721,6 kg	-	-
Material containing silicone	Production raw material	Production	1 813 t	49 450,5 kg	-	-
Carboxymethyl cellulose (CMC)	Production raw material	Production	138 t	3 750,3 kg	-	K2
Styrene Butadiene Rubber (SBR)	Production raw material	Production	888 t	24 210,9 kg	-	K1
Copper foil	Production raw material	Production	7 245 t	197 607,6 kg	H411	K2
Polyacrylic acid (PAA)	Production raw material	Production	4 227 t	115 287.3 kg	H318, H335, H400, H411	K2
Separator film	Production raw material	Production	263 613 319 m^2	7 189 454,7 m^2	-	K1

Material name	Basic-/auxiliary material	Use	Annual used volume	Quantity in storage	H sentences	hazard classification*
Battery tape	Production raw material	Production	128 898 m^2	3 515,4 m^2	-	K1
High temperature polyimide adhesive	Production raw material	Production	106 029 m^2	2 892 m^2	-	-
Outer steel casing	Production raw material	Production	297 million units	8,1 million units	-	-
Cover plate	Production raw material	Production	297 million units	8,1 million units	-	-
Closing needle	Production raw material	Production	297 million units	8,1 million units	-	-
Positive compilation album	Production raw material	Production	297 million units	8,1 million units	-	-
Negative master disc	Production raw material	Production	297 million units	8,1 million units	-	-
Sealing tape	Production raw material	Production	297 million units	8,1 million units	-	-
Insulation blank	Production raw material	Production	297 million units	8,1 million units	-	K1
Electrolyte	Production raw material	Production	13 200 t	317 481 kg	H226, H302, H314, H318, H373	K1
Hydrochloric acid	Supporting material	Laboratory tests	150 l	10 l	H290, H314, H318, H335	K2
Nitric acid	Supporting material	Laboratory tests	50 l	5 l	H272, H290, H331, H314, H318	K2
Anhydrous ethanol	Supporting material	Laboratory tests	900 l	20 l	H225, H319	K2
Titrant for volumetric titration (HYDRANAL™Composite 5 K)	Supporting material	Laboratory tests	100 l	20 l	H351, H360D, H373	K2

Volumetric aldosterone reagent (HYDRANAL™KetoSolve)	Supporting material	Laboratory tests	100 l	20 l	H225, H315, H319, H336, H360D	K2

Material name	Basic-/auxiliary material	Use	Annual used volume	Quantity in storage	H sentences	hazard classification*
Epoxy resin (Crystal King Set)	Supporting material	Laboratory tests	182,5 l	50 l	H302, H314, H318	K1
Karl Fischer reagent (HYDRANAL™Coulomat CG-K)	Supporting material	Laboratory tests	3,65 l	1 l	H312, H319 H360Df	K1
Keller reagent	Supporting material	Laboratory tests	7,3 l	2 l	H272, H290, H300, H310, H314, H318, H330, H335	K1
Karl Fischer reagent (CombiCoulomat fritless Aquastar®)	Supporting material	Laboratory tests	7,3 l	2 l	H225, H301, H331, H311, H370, H412	K1
Karl Fischer reagent (HYDRANAL™Coulomat AK)	Supporting material	Laboratory tests	73 l	20 l	H226, H302, H315, H318, H331, H336, H351, H360FD, H370, H372	K1
Iron chloride ($FeCl_3$)	Supporting material	Laboratory tests	7,3 kg	2 kg	H290, H302, H315, H318,	K2
Rust inhibitor	Supporting material	Production	1 000 kg	60 kg	H226, H304, H317	K2
Marking ink	Supporting material	Production	2 000 kg	60 kg	H302, H413, H301	K2
Heat transfer oil	Supporting material	Termo oil system	310 m^3	310 m^3	-	K2
Polyaluminium chloride (PAC)	Supporting material	Waste water treatment	142 074,9 kg	3 013,71 kg	-	K2
Cationic polyacrylamide	Supporting	Waste water	686,4 kg	14,56 kg	H318	K2

	material	treatment				
Anionic polyacrylamide	Supporting material	Waste water treatment	2 608 kg	53,2 kg	H318	K2
Sodium hydroxide (NaOH)	Supporting material	Waste water treatment	12 741,3 kg	270,27 kg	H314	K2
Phosphoric acid (H_3PO_4)	Supporting material	Waste water treatment	51 143,4 kg	1 084,86 kg	H290, H302, H314, H318	K2
Dimethyl carbonate (DMC)	Supporting material	Production	198 000 kg	4 200 kg	H225	K2
Grease Dissolver	Supporting material	Laboratory tests	21,6 l	12 l	H317, H318	K2
Material name	**Basic-/auxiliary material**	**Use**	**Annual used volume**	**Quantity in storage**	**H sentences**	**hazard classification***
Industrial cleaner	Supporting material	Laboratory tests	146 l	10 l	H222, H229, H315, H317, H336, H411	K1
WD40	Supporting material	Laboratory tests	396 l	33 l	H304, H336, H222, H229	K2
Nitrogen (gas)	Supporting material	Laboratory tests	480 l	40 l	H280	-
Oxygen (gas)	Supporting material	Laboratory tests	80 l	40 l	H270, H280	-
Argon gas	Supporting material	Laboratory tests	3 165,71 l	80 l	H280	-
Helium	Supporting material	Laboratory tests	160 l	40 l	H280	-
Argon-hydrogen mixture	Supporting material	Laboratory tests	80 l	40 l	H221, H280	-
Liquid nitrogen	Supporting material	Laboratory tests	960 l	10 l	H281	-
Corrosion inhibitor	Supporting material	Cooling towers	6 887,1 kg	146,09 kg	H314, H318	K1
Fungicide agent	Supporting material	Cooling towers	4 158 kg	88,2 kg	H272, H314, H318, H400	K1

Dispersant	Supporting material	Cooling towers	1 188 kg	25,2 kg	H314, H318	K2
Alkali	Supporting material	Cooling towers	1 188 kg	25,2 kg	-	K2

* Hazard classification according to Annex I of Government Decree 219/2004 (21.VII.)

As shown in the table above, the higher amounts of substances in the facility are related to the manufacturing activity. Smaller quantities are expected to be present or used for various tests and laboratory analyses. In addition, chemicals used by the wastewater treatment and water treatment systems that supply the cooling towers and the technology represent a more significant quantity.

3.2. The facilities needed to carry out the activity and the related list and location of related facilities

A brief description of the buildings and technology areas planned to be installed in the planning area is given below. The location of the buildings within the site is shown on the detailed site plan attached in Annex 2.2. Floor plans of the buildings on the ground floor and, where applicable, on the first floor, with functional spaces are also attached in Annex 2.2.

3.2.1. Electrode Plant (EN)

The 2-storey building of the production lines for anode films and cathode films for battery cells. Functionally, the building is divided into two main wings along the longitudinal axis, with the anode and cathode production lines in the middle and the service rooms for production and operation on two sides.

An overview of the technical solutions of the building section:

The Electrode Plant is a prefabricated reinforced concrete hall with a pile foundation and two dilatation units. The bark panel plinth facades have aluminium-armoured sandwich panel cladding, and the external doors and windows are of metal construction with an appearance in keeping with the facade's appearance.

The low-pitched, straight-ply, lightweight roof is of trapezoidal sheet design, covered by a facade attic wall of the same height. The steel-framed canopies are clad in sheet metal to match the façade.

The facility will be designed with a hard-wearing industrial floor that meets the requirements of the technology for each room, as detailed in later chapters.

In the interiors, most of the partition walls are sandwich panels, but we also use plasterboard partitions and . Production process rooms are designed with clean-room layouts that minimise contamination and harmful substances. In functional spaces, we create suspended ceilings to meet the requirements of the premises.

Interior finishes and surface treatments are selected to meet functional requirements and are resistant to wear and tear.

The main functions, in order of production technology, starting from the east, are as

follows:

- Cathode and anode mixing areas, slurry production
- Cathode and anode foil coating and drying
- Large cathode and anode coil containers
- Cathode and anode foil pressing and cutting (calendering)
- Storage of cathode and anode

cartridges Ground floor (service areas):

Next to the central production lines, on the north and south side, there is a series of service rooms for production with the following functions:

- Transformer rooms, medium and low voltage distribution and switching rooms

- Sprinkler sub-centres
- NMP transfer rooms
- Maintenance and mechanical rooms
- Shoe changing and meeting rooms for VIP guests
- Workers' changing rooms, changing rooms, meeting rooms and offices
- Tea kitchens and washrooms
- IPC test rooms and dust collection rooms

1st floor (operational areas):

- Storage and loading facilities for cathode and anode powders
- NMP recycling sites
- Aluminium and copper foil containers
- Transformer rooms, medium and low voltage distribution and switching rooms
- Air dehumidifying mechanical rooms
- Production dust collection mechanical rooms
- Additional tool storage rooms

2 lifts are planned for the electrode plant building, 1 passenger lift, 1 passenger and freight lift. Geometric data of the planned building section:

Length of the building section:	233,30 m
The width of the building section:	107,30 m
Interior floor line:	±0.00 m = mBf: +134.10 m
Building height (attic height):	23.30 m (23.55 m with plinth)
Level:	2 (ground floor + 1 floor)
Typical grid sizes:	8 - 12 m
Total gross floor area:	43.266,38 m^2
Total net floor area:	41.224, 95 m^2
Lowest use level:	0,00 m
Top use level:	10,50 m
Roof level:	20,30 - 22,03 m

3.2.2. Assembly Plant (AS)

The assembly of anode and cathode side foils produced in the EL building, as well as aluminium and copper foils supplied as raw materials to the factory site and other assembly auxiliaries is carried out in the 2-storey AS building. Functionally, the building is divided into two main wings along the longitudinal axis, with the battery assembly lines in the middle and the service rooms for production and operation on two sides.

An overview of the technical solutions of the building section:

The Assembly Plant is a prefabricated reinforced concrete hall with a pile foundation and two dilatation units. The bark panel plinth facades have aluminium-armoured sandwich panel cladding, the external doors and windows are of metal construction with an appearance in keeping with the façade.

The low-pitched, straight-ply, lightweight roof is of trapezoidal sheet design, covered by a facade attic wall of the same height. The steel-framed canopies are clad in sheet metal to match the façade.

The facility will be designed with a hard-wearing industrial floor that meets the requirements of the technology for each room, as detailed in later chapters.

In the interiors, most of the partition walls are sandwich panels, but we also use plasterboard partitions and . Production process rooms are designed with clean-room layouts that minimise contamination and harmful substances. In functional spaces, we create suspended ceilings to meet the requirements of the premises.

Interior finishes and surface treatments are selected to meet functional requirements and are resistant to wear and tear.

The main functions, in order of manufacturing technology, starting from the east,

are. Ground floor (factory areas):

- Cutting and winding
- Assembly hall
- First weld
- Jelly roll roll insertion
- Second weld
- Rolling
- X-ray
- Vacuum drying
- Electrolyte injection
- Logistics lifts towards the Moulding Plant Ground floor

(service areas):

- Transformer rooms, medium and low voltage distribution and switching rooms
- Sprinkler sub-centres
- Electrolyte transfer room
- Nitrogen and vacuum pump rooms
- Assembly and spare parts storage rooms
- Separator packing rooms
- Maintenance and mechanical rooms
- Workers' changing rooms, changing rooms, meeting rooms and offices
- Tea kitchens and washrooms

1st floor:

- Temporary storage of structural elements
- Transformer rooms, medium and low voltage distribution and switching rooms
- Air dehumidifying mechanical rooms
- Production dust collection mechanical rooms
- Additional tool and tool storage rooms

1 passenger and freight lift is planned for the assembly plant building.

Geometrical data of the planned building section:

Length of the building section:	255,80 m
The width of the building section:	107,30 m
Interior floor line:	±0.00 m = mBf: +134.10 m
Building height (attic height):	22.30 m (22.55 m with plinth)
Level:	2 (ground floor + 1 floor)
Typical grid sizes:	8 - 12 m
Total gross floor area:	41.746,91 m^2
Total net floor area:	39.954,94 m^2
Lowest use level:	0,00 m
Top use level:	10,50 m
Roof level:	19,35 - 20,85 m

With regard to the above-mentioned X-ray and the β radiation source used for the anode foil layer thickness testing, which will be mentioned several times in the documentation, it should be emphasised that only sealed sources are planned to be used at the plant, no other radioactive sources are used and no radioactive releases to water or air are made in course of the use of nuclear energy, which subject to the provisions of Decree 15/2001 (VI. 6.) KöM on radioactive releases to air and water and their control.

3.2.3. Forming Plant (FO)

Testing, ageing and sealing of the batteries assembled in the AS building will be out in the FO building. The technology areas are on one level, while the technology support functions are on three levels.

An overview of the technical solutions of the building section:

The Moulding Plant is a hall with two dilatation units, a pile foundation and a precast reinforced concrete supporting structure. The facades with bark panel plinths are clad in aluminium-armoured sandwich panel cladding, the external doors and windows are of metal construction with an appearance in keeping with the facade design.

The low-pitched, straight-ply, lightweight roof is of trapezoidal sheet design, covered by a facade attic wall of the same height. The steel-framed canopies are clad in sheet metal to match the façade.

The facility will be designed with a hard-wearing industrial floor that meets the requirements of the technology for each room, as detailed in later chapters.

In the interiors, most of the partition walls are sandwich panels, but we also use plasterboard partitions and . Production process rooms are designed with clean-room layouts that minimise contamination and harmful substances. In functional spaces, we create suspended ceilings to meet the requirements of the premises.

Interior finishes and surface treatments are selected to meet functional requirements and are resistant to wear and tear.

The main functions, in order of manufacturing technology, starting from the east, are:

Ground floor (operational areas):

- Pre-filling and ageing
- Third weld
- Cell cleaning
- Apply at
- Saturation check
- Testing

Ground floor (service areas):

- Transformer rooms, medium voltage and low voltage distribution and switching rooms.
- Sprinkler sub-centres, and small fire control centre.
- Steam room.
- Quality control room.
- Control rooms.
- Spare parts and tool storage.
- Maintenance workshops and mechanical rooms.
- VIP exit.
- Workers' shoe changing, meeting and office space.
- Kitchenettes and washrooms.

1. floor (gallery level):

- The Moulding Plant building has two levels of galleries for the internal conveyor
- Gallery level on the east side Gallery of the conveyor belt system connected to the logistics lifts from the ground floor of the Assembly Plant building, with external escape stairs
- On the west side is the gallery of the conveyor belt system connected to the elevators from the high storage areas of the Moulding Plant building, which conveys the semi-finished products to the Sorting Warehouse building. It also houses the conveyor cleaning equipment.

2. floor:

- The top service floor of the building, where the air-handling and dehumidification rooms the electrical switch and control rooms are located.

2 lifts are planned for the Moulding Plant building, 1 passenger lift, 1 passenger and freight lift. Geometric data of the planned building section:

Length of the building section:	191,90 m
The width of the building section:	163,30 m
Interior floor line:	±0.00 m = mBf: +134.10 m
Building height (attic height):	22.30 m (22.55 m with plinth)
Level:	3 (ground floor + 2 floors)
Typical grid sizes:	6,9 - 14 m
Total gross floor area:	49.705,88 m^2

Total net floor area: 46.195,20 m²
Lowest use level: 0.00 m
Intermediate service level (1st floor): 5.50 m Top service level (2nd floor): 12.50 m
Roof level: 19,00 - 21,30 m

3.2.4. Sorting Warehouse Plant (SO)

The completed battery cells are stored and packaged in a high-bay storage system, which also has an engineering gallery level.

An overview of the technical solutions of the building:

The Sorting Warehouse Plant is a prefabricated reinforced concrete hall with a pile foundation, consisting of three dilatation units. The bark panel plinth facades have aluminium-armoured sandwich panel cladding and the external doors and windows are of metal construction with an appearance in keeping with the façade.

The low-pitched, straight-ply, lightweight roof is of trapezoidal sheet design, covered by a facade attic wall of the same height. The steel-framed canopies are clad in sheet metal to match the façade.

The facility will be designed with a hard-wearing industrial floor that meets the requirements of the technology for each room, as detailed in later chapters.

In the interiors, most of the partition walls are sandwich panels, but we also use plasterboard partitions and . The production and storage areas are designed with clean-room layouts that minimise contamination and harmful substances. In functional spaces, we create suspended ceilings to meet the requirements of the premises.

Interior finishes and surface treatments are selected to meet functional requirements and are resistant to wear and tear.

The main features :

Ground floor:

- During the conveyor belt system from the gallery level, the battery cells to be loaded are X-ray scanned for possible foreign body monitoring
- On the south side of the building, 7 almost identical automated high-bay warehouses store 10-10 rows of semi-finished products before packaging
- 8 automatic high-bay warehouses for storing finished products already packaged
- On the east side of the building is the picking area under the packaging plant, where the finished products are on the truck.

On this level there is also a VIP entrance and a staff social block with toilets.

- Transformer rooms, medium and low voltage distribution and switching rooms
- Sprinkler sub-centre

1. floor (gallery level):

- The conveyor belts coming from the north-west via a bridge from the FO building arrive at this level
- An external conveyor belt system connects the high-bay rooms
- On the other side of the building, on the east side, there is a packaging and wrapping area

2. floor:

- Transformer rooms, medium and low voltage distribution and switching rooms
- Air handling and air conditioning plant rooms

1 passenger and freight elevator is planned for the Sorting Warehouse Plant. Geometrical

data of the planned building:

Length of the building:	284,20 m
The width of the building:	100,90 m
Interior floor line:	±0.00 m = mBf: +134.10 m
Building height (attic height):	21.32 m (21.62 m with plinth)
Level:	3 (ground floor + 2 floors)
Typical grid sizes:	8 - 14,5 m
Total gross floor area:	38.073,84 m^2
Total net floor area:	35.218,82 m^2
Lowest use level:	0,00 m
Intermediate gallery level (1st floor)	5,00 m
Top use level (2nd floor):	10,50 m
Roof level:	19,35 - 20,95 m

3.2.5. Raw Materials Warehouse (RM)

A 3-storey building used for the storage of raw materials for production.

The part of the building, with a floor area of approximately 4000 m(2), is divided into two main groups of rooms: sorting and functional rooms, and a high-bay storage room.

An overview of the technical solutions of the building section:

The Raw Material Warehouse is a prefabricated reinforced concrete hall with a pile foundation, forming a dilatation unit. The bark panel plinth facades have aluminium-armoured sandwich panel cladding, and the external doors and windows are of metal construction with an appearance to match the façade.

The low-pitched, straight-ply, lightweight roof is of trapezoidal sheet design, covered by a facade attic wall of the same height. The steel-framed canopies are clad in sheet metal to match the façade.

The facility will be designed with a hard-wearing industrial floor that meets the requirements of the technology for each room, as detailed in later chapters.

In the interiors, most of the partition walls are sandwich panels, but we also use plasterboard partitions and . The laboratory process rooms are designed with clean-room layouts that minimise contamination and harmful substances. In the functional spaces, suspended ceilings are installed to meet the requirements of the rooms.

Interior finishes and surface treatments are selected to meet functional requirements and are resistant to wear and tear.

The main features :

Ground floor:

- 3 industrial dock doors to receive the raw materials for production, palletised system.
- After the sorting on the ground floor, the raw materials to be stored are taken to the 9-position automatic high-bay warehouse.
- In addition, there are ancillary plant rooms serving this part of the building and a briefing office for the warehouse staff.
- Gas cylinder storage and solid waste storage rooms are also located on this level.

1. floor:

- Access to the upper floor is possible by stairs or by passenger lift. This is an intermediate level, essentially with mechanical rooms and a large storage room for various items.

2. floor:

- The level of IQC (Incoming Quality Control) laboratories, where Eve Power Hungary Kft. can perform physical and chemical quality control of incoming raw materials and substances. With the necessary social facilities for the laboratory staff working here.

1 passenger and freight elevator is planned for the raw material storage building. Geometrical data of the planned building section:

Length of the building section:	100,40 m
The width of the building section:	64,40 m
Interior floor line:	±0.00 m= mBf: +134.10 m
Building height (attic height):	19,30 m
Level:	3 (ground floor+ 2 floors)
Typical grid sizes:	6,6 - 11 m
Total gross floor area:	9.405,86 m^2
Total net floor area:	8.956,63 m^2
Lowest use level:	0,00
Intermediate use level (1st floor):	4,70 m
Top use level (2nd floor):	10,50 m
Roof level:	17,20 - 18,45 m

3.2.6. Multifunctional Building (MU)

The factory is a 3-storey, 100x25 m multifunctional building with central office and social block functions, VIP functions (conference and exhibition space), a canteen and canteen kitchen, test labs, central server room and a fire station facility.

<u>An overview of the technical solutions of the building section:</u>

The Multifunctional Building is a precast reinforced concrete supporting structure with a pile foundation forming a dilatation unit. The facades with bark panel plinths are clad with aluminium-armoured sandwich panel cladding, the external windows are of metal construction with an appearance in keeping with the façade.

The low-pitched, straight-pitched roof is of monolithic reinforced concrete construction, covered by a facade attic wall of the same height. The steel-framed canopies are clad in sheet metal to match the façade.

The facility will be designed with hard-wearing floors to meet the functional and technological requirements of each room, as detailed in later chapters.

In the interiors, the bulkheads and lobbies are largely made up of plasterboard walls, and a masonry wall is also used towards the RM building. The test process rooms have a clean room design that minimises contamination and harmful substances. Suspended ceilings will be installed in the interior design and functional spaces, meeting the requirements of the premises.

Interior finishes and surface treatments are selected to meet functional requirements and are resistant to wear and tear.

The main features :

<u>Ground floor:</u>

- Lobby and reception area: the central reception area of the multifunctional building. This is the main reception area for office staff on shifts and VIP guests. The Lobby includes a 2-person reception desk and receptionists' back offices. Upstairs access is via stairs and/or passenger lift.
- VIP area: a separate exhibition area will present the company and production history, objectives, achievements and awards of Eve Power Hungary Kft. to VIP visitors. For the guests there will be a conference room with a capacity of 20-30 people.
- Facility fire brigade: depending on the disaster management classification of the facility, a full-time facility fire brigade is expected to be established under the operation of Eve Power Hungary Kft. The exact parameters of this will be specified by the Authority during the disaster management licensing process.
- IT department: an office environment where the central storage and software/hardware maintenance of the IT tools required for the operation of the battery factory is carried out.
- Cooking kitchen: a kitchen of two nationalities (Chinese and Western) will be built to provide 3 meals per day for the factory workers, together with service and utility rooms

<u>1. floor:</u>

- Canteen: Dining area for clerks and factory workers in the factory. The design was based on Eve Power Hungary Kft.'s requirements, which will include a single dining area for more than 300 people, 3 traditional Chinese dining rooms and a manager's canteen with a box design.

- Offices: an open-office area and separate rooms will be available for the management and administrative staff to meet the operational needs of Eve Power Hungary Kft. The office space will include separate meeting rooms and a tea room lounge for staff.

2. floor:

- Test labs: group of test labs for life cycle analysis of the batteries produced
will be located on the top floor of the MU building at the request of Eve Power Hungary Kft.
- Server centre: the battery factory's data centre, where a cold-warm server room provides the IT backbone to manage production, logistics and administrative information.
- Transformer room, medium and low voltage distribution and switch rooms. Roof level:
- The roof will house outdoor mechanical units and filter equipment for the test laboratory.

The Multifunctional Building will have 4 lifts, including 1 passenger lift, 2 passenger and freight lifts and an automatic van lift.

Geometric data of the planned building part:

Length of the building section:	100,40 m
The width of the building section:	25,20 m
Interior floor line:	±0.00 m= mBf: +134.10 m
Building height (attic height):	19.30 m (19.75 m on the west side)
Level:	3 (ground floor+ 2 floors)
Typical grid sizes:	8,4 - 10 m
Total gross floor area:	7,591.11 m^2
Aggregate net floor area:	7.011,46 m^2
Lowest use level:	0,00
Intermediate use level (1st floor):	5,00 m
Top service level (2nd floor):	9,50 m
Roof level:	16,50 - 17,15 m

3.2.7. Supply Station (PS)

Eve Power Hungary Kft. is a 2-storey building of approximately 218 x 41 m, which houses the boilers, compressed air supply equipment and nitrogen generators, as well as the elements of the fuel water system, waste water treatment plant, the hydropower supply system and the grey water treatment system, all of which are necessary the production of the industrial media required for the operation of the Battery Factory.

An overview of the technical solutions of the building:

The Supply Station is a hall with a pile foundation, mixed precast reinforced concrete and monolithic reinforced concrete supporting structure, consisting of three dilatation units. The facades with bark panel plinths are clad with aluminium-armoured sandwich panel cladding, the external windows are of metal construction with an appearance in keeping with the façade.

The low-pitched, straight-pitched roof is of precast reinforced concrete construction, covered by an attic wall of the same height. The steel-framed canopies are clad with sheet metal cladding to match the façade.

A hard-wearing industrial floor is designed for the facility, meeting the requirements of the technology for each room, as detailed in later chapters.

In the interiors, most of the partition walls are sandwich panels, but we also use plasterboard partitions and partitions in the washrooms. The plant rooms have a clean room design that minimises contamination and harmful substances. In this building, false ceilings are only installed in the washrooms.

Interior finishes and surface treatments are selected to meet functional requirements and are resistant to wear and tear.

The main features :

Ground floor:

- Hot oil system
- Steam system
- Compressed air and nitrogen supply system
- Cooling water and chilled water system
- Waste water treatment system
- Technological water preparation systems (steam, process water, cooling towers)
- Operational assembly point

1. floor:

- Refrigerators for air handling equipment
- The energy centre of the building, where the controls and electrical distribution and switch rooms are located
- Purified water tanks
- Nitrogen generators room
- Air compressor rooms Roof

level:

- Cooling towers on the roof, and inlet and outlet structures and chimneys for the different technologies

Geometric data of the planned building:

Length of the building:	217,70 m
The width of the building:	41,20 m
Interior floor line:	±0.00 m= mBf: +134.20 m
Classroom storage part of the building (attic m.): 18,30 m (18,60 m with plinth) Level no:	2 (ground floor + 1 floor)
Typical grid sizes:	9,5 - 10,5 m
Total gross floor area:	17,960.11 m^2
Aggregate net floor area:	14.729,02 m^2
Lowest use level:	0,00 m
Top use level:	8,00 m
Roof level:	16,30 - 17,00 m

3.2.8. NMP Tank Park (NT)

Storage and supply facilities for NMP and contaminated NMP used for slurry production. The horizontal, cylindrical tanks are placed in a reinforced concrete damage containment basin within a building. In addition, a tanker truck NMP unloading station will be constructed where the tanks will be unloaded. The function will also include a treatment room.

The NMP tank farm can be divided into the following main units:

- Building for storage tanks
- Landing area
- Emergency slop
- Gas scrubber building
- Pump rooms
- Pipe bridge

<u>An overview of the technical solutions of the building complex:</u>

The NPM Tank Park building is a watertight monolithic reinforced concrete hall with a slab foundation and plinth, steel supporting structure. The watertight reinforced concrete plinth facades are clad with trapezoidal sheet cladding and the external doors and windows are of metal construction with a design that blends in with the facade. The low-pitched lightweight roof is of trapezoidal sheet design.

The facility will be designed with a hard-wearing industrial floor that meets the requirements of the technology for each room, as detailed in later chapters.

The NMP unloading area is a covered open container vehicle entrance built into the Tank Farm building. Precipitation protection is provided by a trapezoidal sheet roof structure shared with the Tank Farm. Under the discharge area, a damage containment facility with HDPE sheeting and monitoring system will be provided, as detailed in later chapters.

The NMP control building is a free-standing building with a monolithic reinforced concrete slab foundation, steel frame and sandwich panel cladding. The low-pitched, straight-pitched, lightweight structural roof is of trapezoidal sheet design, covered by a facade attic wall of the same height. The steel-framed canopies have sheet metal cladding to match the façade. The exterior windows are of metal construction with an appearance in keeping with the façade. The partition walls in the interiors will be made of sandwich panels.

The process rooms are designed with a clean-room layout that minimises contamination and harmful substances. No suspended ceilings are used in the building complex. Interior finishes and surface treatments are selected based on functional requirements and are made of materials that are resistant to wear and tear.

The NMP tank farm has a dual technological function:

- store new NMP
- storage of contaminated NMP

Environmental protection and groundwater protection were the primary concerns in the design of the NMP storage tank farm, and a tiered spill protection system was developed accordingly:

- a liquid-tight, reinforced concrete spill-resistant epoxy coating of 50% of the total capacity, with a surface resistant to NMP, in accordance with legal requirements, the epoxy used must have a chemical resistance to NMP of at least 24 hours, any spillage must be cleaned up within this time, which means pumping the spillage into a slurry tank located adjacent to the building and washing the coating with water. Minor drips shall be immediately soaked up and the surface washed with water the integrity of the coating checked. After any havaria situation the coating should be checked to ensure that it retains its functionality, if damaged the area should not be used until the coating is repaired. Stainless steel damage trays shall be placed under the drainage pipes. Adequate provision of a suitable debris storage area is required (dewatering wipers),
- HPDE membrane is installed under the entire containment and discharge area, with a leakage control manhole

  belong to,
- the storage tanks and the discharge area are also covered,
- the entire building is ventilated by a gas

scrubber. Geometric data of the planned building

sections:

Length of tank storage part of the building: 16,59 m
Width of the tank storage part of the building: 22,30 m
Tank storage part of the building internal floor line: ±0,00 m= mBf: +134,50 m (slopes)
Tank storage building part core (attic m.): 6,91 - 8,20 m

Length of the building part of the catchment area: 11,60 m
Width of the building part of the drainage area: 36,40 m
Drainage area building part roof core.: 7,26 - 8,20 m

Control building section length: 14,64 m
Control building section width: 10,01 m
Controlling building part internal floor line: ±0,00 m= mBf: +134,50 m
Control building part core (attic m.): 5,70 m^2

Total gross floor area: 514,14 m^2
Total net floor area: 473,00 m^2
Lowest use level: 0.00 m (+0.40 m - relative to the general floor level) Roof
level (control building): 5,15 - 5,45 m

3.2.9. Electrolyte Tank Farm (ET)

Facility for the storage and supply of electrolyte for assembly. The stationary cylindrical pressure vessels are placed in a reinforced concrete damage containment basin within a building. In addition, a tanker truck electrolyte discharge station will be constructed where the discharge operation will be carried out. The function will include various filtration equipment and pumps.

The Elektrolit tank farm can be divided into the following main units:

- Building for storage tanks
- Landing area

- Emergency slop
- AC tower
- Pump rooms
- Pipe bridge

An overview of the technical solutions of the building complex:

The Elektrolit Tank Farm building is a watertight monolithic reinforced concrete hall with a precast reinforced concrete supporting structure with a reinforced concrete slab foundation and plinth. The watertight reinforced concrete plinth facades are clad with aluminium-armoured sandwich panel cladding, the external windows are of metal construction with an appearance in keeping with the facade design. The low-pitched, straight-ply lightweight roof is of trapezoidal sheet design, covered by a facade attic wall of the same height.

The facility will be designed with a hard-wearing industrial floor that meets the requirements of the technology for each room, as detailed in later chapters.

The Electrolyte unloading area is a covered open access vehicle parking area built in the same building as the Tank Farm. Rainfall protection is provided by a trapezoidal sheet covered half-slope roof structure attached to the Tank Farm. Underneath the drop-off area, a damage containment facility with HDPE sheeting and monitoring system will be provided, as detailed in later chapters.

The Electrolit Control Building is a monolithic reinforced concrete slab-on-grade, precast reinforced concrete frame, sandwich panel clad annex. The low-pitched, straight-pitched roof is made of reinforced concrete, covered by an attic wall of the same height. The steel-framed canopies are clad in sheet metal to match the façade. The exterior windows are of metal construction with an appearance in keeping with the façade. The partition walls in the interiors will be made of sandwich panels.

The process rooms are designed with a clean-room layout that minimises contamination and harmful substances. No suspended ceilings are used in the building complex. Internal finishes and surface treatments are selected to meet functional requirements and are made of materials resistant to wear and tear.

The electrolyte storage tank farm was designed with environmental protection and groundwater protection as a primary consideration, and a multi-level spill protection system was developed accordingly:

- a liquid-tight, reinforced concrete damage barrier to 50% of full capacity, with an electrolyte-resistant, non-sparking, liquid-tight epoxy coating on the surface, in accordance with legal requirements,
- HPDE membrane is installed under the entire containment and discharge area, with a leakage control manhole
  belong to,
- the storage tanks and the discharge area are also covered,
- the entire building is ventilated by a gas

scrubber. Geometrical data of the planned building:

Length of classroom storage building: 18,40 m
Width of the classroom part of the building: 15,40 m
Classroom part of the building internal floor line: ±0.00 m= mBf: +134.20 m (slope varies)
Tank storage building part core (attic m.): 14,10 m (14,50 m with plinth)

Control building section length: 7,70 m
Control building section width: 15,40 m
Controlling building part internal floor line: ±0,00 m= mBf: +134,20 m
Control building part core (attic m.): 8,10 m (8,50 m with plinth)

Length of the building part of the catchment area: 37,25 m
Width of the building part of the drainage area: 9,05 m
Drainage area building part roof core.: 5,68 - 6,81 m
Level number of building units: 1 (ground floor)
Typical grid sizes: 9,5 - 10,5 m

Total gross floor area: 450,74 m^2
Total net floor area: 357,00 m^2
Lowest use level: 0,00 m
Roof level (classroom): 13,31 - 13,38 m
Roof level (control building): 7,08 - 7,15 m

3.2.10. Battery Test Lab (BS)

The completed battery cell complex is a ground floor laboratory building measuring approximately 27 x 38

metres. Overview of the technical solutions of the building:

The Battery Test Laboratory is a prefabricated reinforced concrete frame building with a pile foundation forming a dilatation unit. The bark panel plinth facades are aluminum-armed sandwich panel cladding, and the exterior fenestration is metal with a metal structure to match the façade appearance.

The low-pitched, straight-pitched roof is of monolithic reinforced concrete construction, covered by a facade attic wall of the same height. The steel-framed canopies are clad with sheet metal cladding to match the façade.

The facility will be designed with a hard-wearing industrial floor that meets the requirements of the technology for each room, as detailed in later chapters.

The partition walls in the interiors are of monolithic reinforced concrete construction. The test process rooms are of clean-room design, which minimises contamination and harmful substances. In some functional spaces, suspended ceilings will be constructed according to the requirements of Eve Power Hungary Kft., reducing the ceiling height and meeting the requirements of the rooms.

Interior finishes and surface treatments are selected to meet functional requirements and are resistant to wear and tear.

The main features :

Ground floor:

- Preparation rooms (sample storage, test part welding, etc.).
- Office space.
- Mechanical resistance test (impact, shaking, dropping, etc.).
- Physical load resistance test (compression, puncture, etc.).

- Environmental resistance test room (warm humid air, salt air, low air pressure).
- Salt environment resistance test (salt water immersion, salt air test).
- Electrical testing (overload, discharge, short circuit, thermal overload testing).
- Disposal room (disassembly of tested batteries).
- Mechanical room (dehumidification).
- Electrical control room.
- Transformer room, medium voltage and low voltage distribution and switch rooms. Roof level:
- On the roof there are inlet and outlet structures and chimneys for the different technologies.

Geometrical data of the planned building:

Length of the building: 27,10 m
The width of the building: 38,20 m
Interior floor line: ±0.00 m= mBf: +134.10 m
Building height (attic height): 9.30 m (9.60 m with plinth) Level: 1 (ground floor)
Typical grid sizes: 8,70 - 9,60 m

Total gross floor area: 1.035,26 m^2
Total net floor area: 964,82 m^2
Lowest use level: 0,00 m
Roof level: 7,15 - 7,67 m

3.2.11. Anode Foil Treatment Building (BD)

The de-stressing of live anode foils from battery cells damaged during production or logistics within the plant is carried out in this ground floor building.

Functions:

- Anode foil de-voltaging
- Hazardous waste storage

An overview of the technical solutions of the building:

The Anode Foil Treatment Building is a precast reinforced concrete frame building with a reinforced concrete slab foundation and infill masonry. The façades are clad with a thermal insulation thin-film cladding system and the external windows and doors are of metal construction with a design that blends in with the façade.

The straight-ply flat roof is a monolithic reinforced concrete structure, covered by an attic wall of the same height. The steel canopies are clad in sheet metal to match the façade.

The facility will be designed with a hard-wearing industrial floor that meets the requirements of the technology for each room, as detailed in later chapters.

In the interior, the partition walls are masonry. The test process rooms are of clean-room design to minimise contamination and harmful substances. The building will have a suspended ceiling, meeting the requirements of the premises.

Interior finishes and surface treatments are selected to meet functional requirements and are resistant to wear and tear.

Geometric data of the planned building:

Length of the building:	11,60 m
The width of the building:	9,45 m
Interior floor line:	±0.00 m= mBf: +134.10 m
Building height (attic height):	5.47 m (5.67 m with plinth) Level no:
	1 (ground floor)
Typical grid sizes:	5,70 - 8,85 m
Total gross floor area:	109,62 m^2
Total net floor area:	97,35 m^2
Lowest use level:	0,00 m
Roof level:	4,90 - 5,10 m

3.2.12. Hazardous waste collection point or storage facility (DW)

A building measuring approximately 26.5 x 14 metres, in which a central storage area for hazardous waste generated during production (plant collection point) and a hazardous materials storage area for some of the hazardous materials to be used during production are planned to be constructed in separate rooms.

An overview of the technical solutions of the building:

The Hazardous Waste Facility and Hazardous Materials Storage Facility is a dilatation unit, precast reinforced concrete frame building with a reinforced concrete slab foundation and infill masonry. The façades are clad with a thermal insulation system of thin concrete cladding and the external windows and doors are of metal construction with a design that blends in with the façade.

The low-pitched gable roof is of monolithic reinforced concrete construction, with a low-pitched gable roof of straight courses, covered by a facade attic wall of the same height. The steel canopies are clad in sheet metal to match the façade.

The facility will be designed with a hard-wearing industrial floor that meets the requirements of the technology for each room, as detailed in later chapters.

In the interior, the partition walls are masonry. The test process rooms are of clean-room design to minimise contamination and harmful substances. The building will have a suspended ceiling, meeting the requirements of the premises.

Interior finishes and surface treatments are selected to meet functional requirements and are resistant to wear and tear.

Geometric data of the planned building:

Length of the building:	13,85 m

The width of the building: 26,70 m
Interior floor line: ±0,00 m= mBf: +134,10 m
Building height (attic height): 6,25 m (6,55 m with plinth) Level: 1 (ground floor)
Typical grid sizes: 6,6 - 8,8 m
Total gross floor area: 344,52 m^2
Total net floor area: 317,13 m^2
Lowest use level: 0,00 m
Roof level: 5,10 - 5,60 m

3.2.13. Other additional buildings, parts of buildings, facilities

Stairway buildings (Logistics Gate (LO) - Employee Gate (EM) transport and logistics entrance/exit stairway buildings). These reinforced concrete frame buildings differ in appearance from the yellow and beige architectural design, with grey cladding.

3.2.13.1. LO- Building

The logistics portal building on the south side of the site consists of two main parts; the west side houses the security guards' technical room, while the east side is a mixed-function reception building with a reception office and a driver's waiting room with associated toilets.

An overview of the technical solutions of the building:

The Logistics Porter Building is a monolithic reinforced concrete building with a reinforced concrete slab foundation. The façades are clad with insulating aluminium sheeting and the external windows and doors are of metal construction, with a design that blends in with the façade.

The straight-ply flat roof is a monolithic reinforced concrete structure, covered by an attic wall of the same height. The steel canopies are clad in sheet metal to match the façade.

The facility will be designed with hard-wearing flooring to meet the functional requirements of each room.

The interior partition walls are made of plasterboard. The building will have suspended ceilings only in the toilets.

Interior finishes and surface treatments are selected to meet functional requirements and are resistant to wear and tear.

Geometric data of the planned building:

Length of the building section: 20,50 m
The width of the building section: 8,70 m
Interior floor line: ±0,00 m= mBf: +133,95 m
Building height (attic height): 5,00 m (5,30 m with plinth) Level: 1 (ground floor)

Total gross floor area: 175,82 m^2

Total net floor area: 137,36 m^2
Lowest use level: 0.00 m (-0.15 m - relative to the general floor level) Roof level: 4,10 - 4,30 m

3.2.13.2. EM-Agency

On the eastern side of the site is the porter's lodge, which is essentially the security guards' residence.

An overview of the technical solutions of the building:

The Eastern Staircase Building is a monolithic reinforced concrete supporting structure with a reinforced concrete slab foundation. The façades are clad in aluminium sheet with insulating trays, the external windows and doors are of metal construction with a design in keeping with the façade.

The straight-ply flat roof is a monolithic reinforced concrete structure, covered by an attic wall of the same height. The steel canopies are clad in sheet metal to match the façade.

The facility will be designed with hard-wearing flooring to meet the functional requirements of each room.

The interior partition walls are made of plasterboard. The building will have suspended ceilings only in the toilets.

Interior finishes and surface treatments are selected to meet functional requirements and are resistant to wear and tear.

Geometric data of the planned building:

Length of the building section: 6,20 m
The width of the building section: 9,70 m
Interior floor line: ±0,00 m= mBf: +135,20 m
Building height (attic height): 4,30 m (4,60 m with plinth) Level: 1 (ground floor)

Total gross floor area: 36,48 m^2
Total net floor area: 27,81 m^2
Lowest use level: 0.00 m (+1.10 m - relative to the general floor level) Roof level: 3,95 - 4,00 m

3.2.13.3. Connecting bridges (BA, BF)

Members connecting individual buildings for internal manipulation based on conveyor belt technology. The steel-framed connecting building sections on reinforced concrete piers have no other function, but are suitable for human passage due to the need for maintenance work.

An overview of the technical solutions for the connecting building sections:

The building sections connecting BA and BF are steel trussed building sections on precast reinforced concrete piers, connected to the adjacent buildings by structural expansion. The facades are clad with aluminium-armoured sandwich panel cladding, no external fenestration is planned.

The straight-ply flat roof has a trapezoidal plate structure, covered by an attic wall of the same height.

We design industrial flooring in the building areas to withstand the stresses and strains, meeting the requirements of the technology in each room.

The interior of the BF bridge is designed with clean spaces that minimise contamination and harmful substances. For this purpose, a sandwich panel curtain wall and suspended ceiling are planned for the steel truss structure.

Interior finishes and surface treatments are selected to meet functional requirements and are resistant to wear and tear.

Geometric data of the planned BA-bridge building section:

Length of the building section:	19,60 m
The width of the building section:	7,40 m
Interior floor line:	+10.50 m= mBf: +144.60
Building height:	6.06 m (15.56 m)
Space section under a building:	9,91 m
Level:	1 (1st floor)
Typical grid sizes:	3,3 - 13 m
Total gross floor area:	145,04 m^2
Total net floor area:	142,04 m^2
Lowest use level:	10,50 m
Roof level:	14,65 - 14,91 m

Geometric data of the planned BF-bridge building section:

Length of the building section:	19,60 m
The width of the building section:	6,90 m
Interior floor line:	+5.50 m= mBf: +139.60
Building height:	5.96 m (10.16 m)
Space section below a building section:	4,65 m
Level:	1 (1st floor)
Typical grid sizes:	3,3 - 13 m
Total gross floor area:	135,59 m^2
Total net floor area:	129,83 m^2
Lowest use level:	5,50 m
Roof level:	9,27 - 9,47 m

3.2.13.4. Smoking pavilions

As smoking is strictly prohibited in the entire plant, Eve Power Hungary Kft. provides smoking facilities for employees and visitors in designated covered-open glass pavilions. These prefabricated, modularly-graded smoking booth products, located along the eastern and western boundaries of the site.

3.2.13.5. Central Waste storage

A central covered-open collection point for separately collected municipal waste.

3.2.14. Substation (SU)

The transformer substation serves the entire Eve Power Hungary Kft.

According to the information available, the connection is redundant from the MACS 132/22 kV substation of the electricity supplier.

The approximately 100 x 40 metre area will house high-voltage transformers, a geographic information room, a central control room, a medium-voltage switch room and an on-site battery and capacitor bank. The total expected gross floor area of the "SU" building is approximately 4,000 m^2.

3.3. Planned date of installation and operation

At this stage of planning, the following timetable development can be outlined:

- Start of site preparation works: October 2023
- Start of construction works: January 2025
- Start of operation: June 2027

Site preparation and pile foundation works are currently underway in the planning area, based on a valid building permit. The area is a designated investment area. The location of the site and a visual plan of the proposed facility are shown in the figures below.

2. Figure 1: Location of the planning area (source: Google Earth)

3. Figure 1: Site plan of the facility (Source: TSPC)

4. Technology description

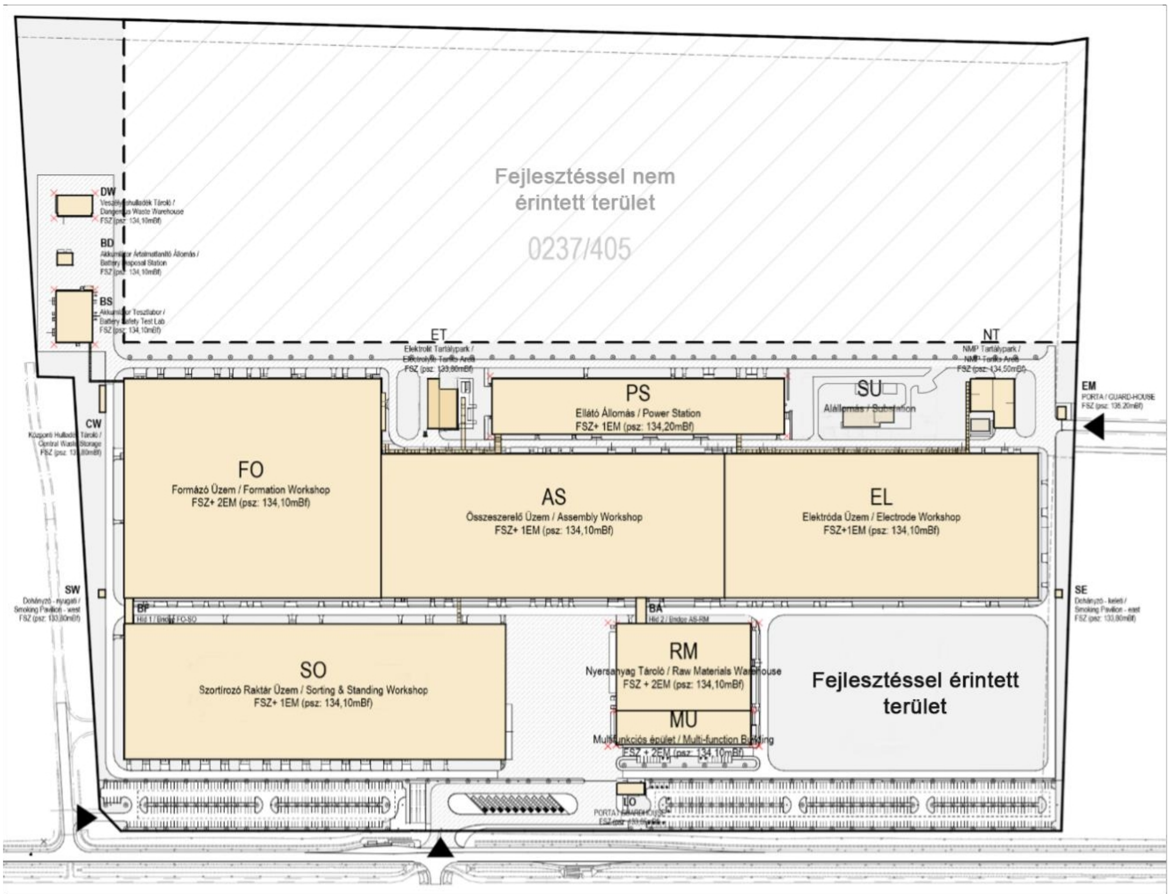
4.1. Activity characteristics, capacity of

The plant to be built will produce lithium-ion batteries with a planned capacity of 30 GWh/year. The planned production plant will supply the neighbouring BMW plant with new generation cylindrical battery cells.

Detailed capacity data are given in chapter 3.1.

4.2. Facilities in the area

The main production process is carried out in the 3 main buildings, the 3 production buildings are interconnected but structurally separate buildings (EL, AS, FO). The other buildings on the site are used for storage of raw materials and finished products, storage of waste from the technology, testing of finished products and other service buildings.



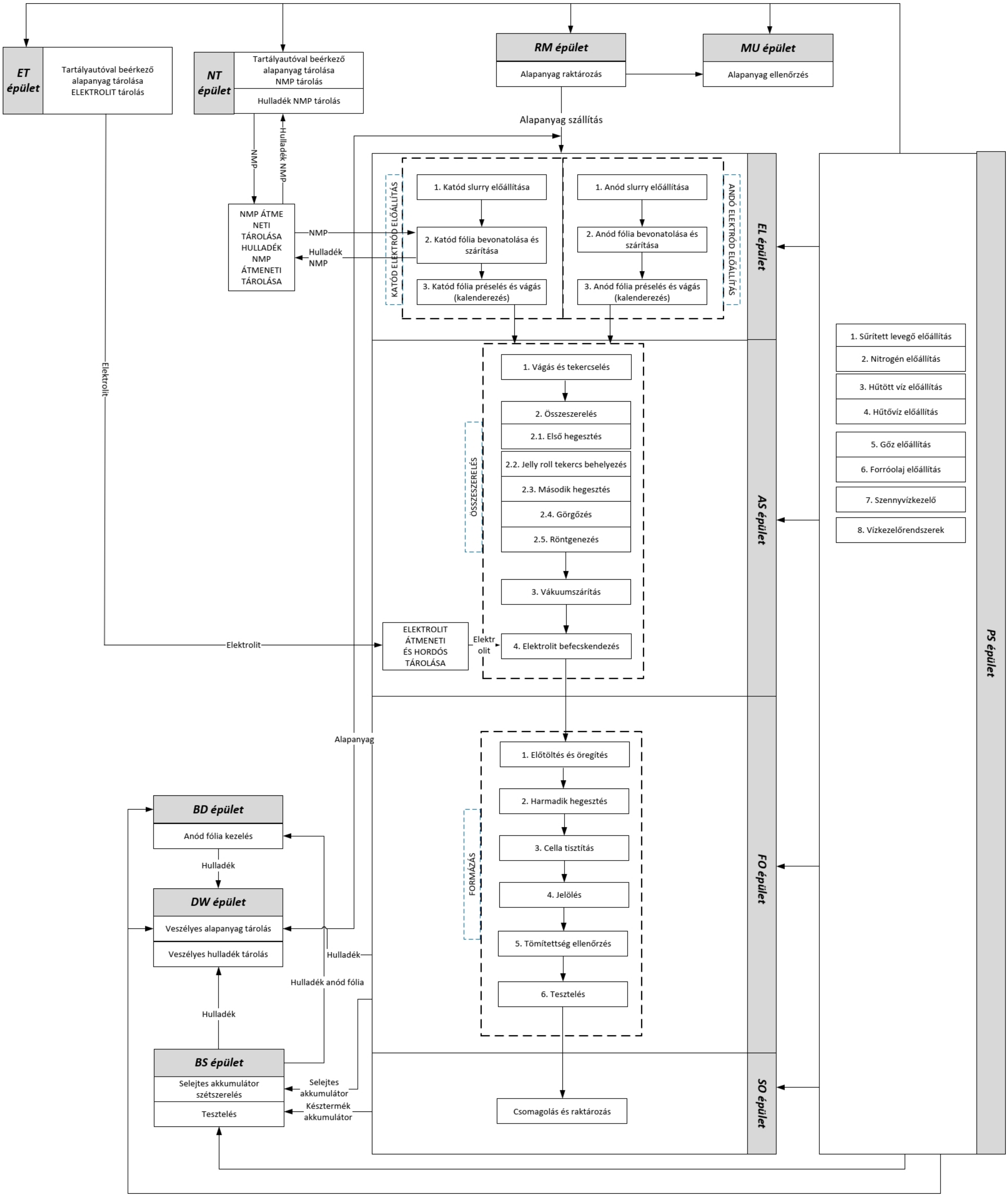
4. Figure 1: Location of buildings

Building identifier	Name of building	Function
EN	Electrode plant	Technology building First step of the main production process - Production of anode and cathode 3 anode and 3 cathode production line

AS	Assembly plant	Technology building Second step of the main production process - Assembly of batteries on 3 production lines A-B
Building identifier	**Name of building**	**Function**
FO	Forming Plant	Technology building The third step of the main manufacturing process - Battery moulding, ageing and final welding, testing
SO	Sorting Warehouse Plant	Warehouse High-bay storage and packaging
RM	Raw material warehouse	Warehouse Passive storage of raw materials, incoming materials quality control
MU	Multifunctional building	Multifunctional building Office space, kitchen and canteen, test labs, central server room and facility fire department
PS	Supply station	Technology service building The supply systems needed to operate the technology and the building (hot oil, steam, cooling water, chilled water, compressed air, nitrogen, waste water treatment, water treatment, sprinkler centre, water tanks).
NT	NMP tank farm	Service building Storage of feedstock and waste NMP in hazardous liquid storage tanks
EN	Electrolyte tank farm	Service building Storage of electrolyte raw material in pressure equipment
BS	Battery test lab	Service building Testing of finished batteries to specifications and dismantling of scrap batteries
BD	Anode foil treatment building	Service building Substandard quality waste from the production process building for the treatment of battery anode foil
DW	Hazardous waste collection point, hazardous waste warehouse	Waste collection point Storage of hazardous waste from production and storage of hazardous raw materials (DMC, ethanol, thermal oil)
EM	Workers' gate	Serving facility Employee access point
LO	Logistics gateway	Serving facility Mixed function reception building
SU	Substation	Serving facility Ensuring electricity supply

4.3. Presentation of the main production buildings related to the technology

An overview of the technological functions and processes of each building:

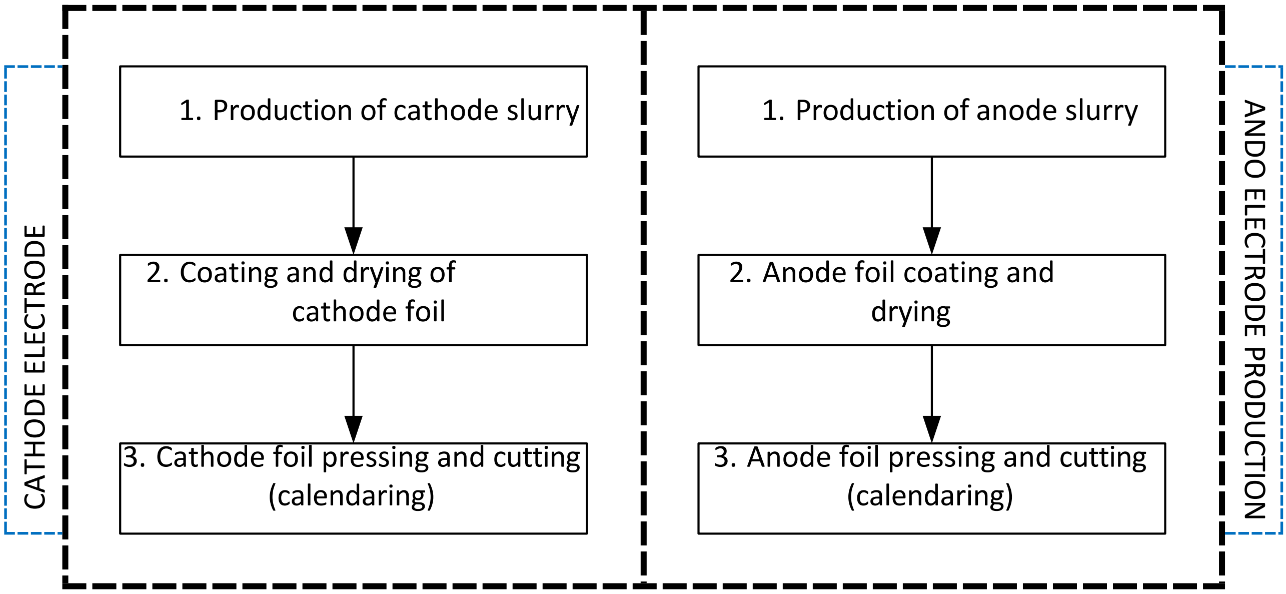


5. Figure 1: Technological functions and processes of each building

5.1.1. EN building

The first step of the manufacturing process is the production of coiled anode and cathode electrodes in the EL building

meg.



6. Figure 3: The production of the anode and cathode electrode

6.1.1.1. Technology description

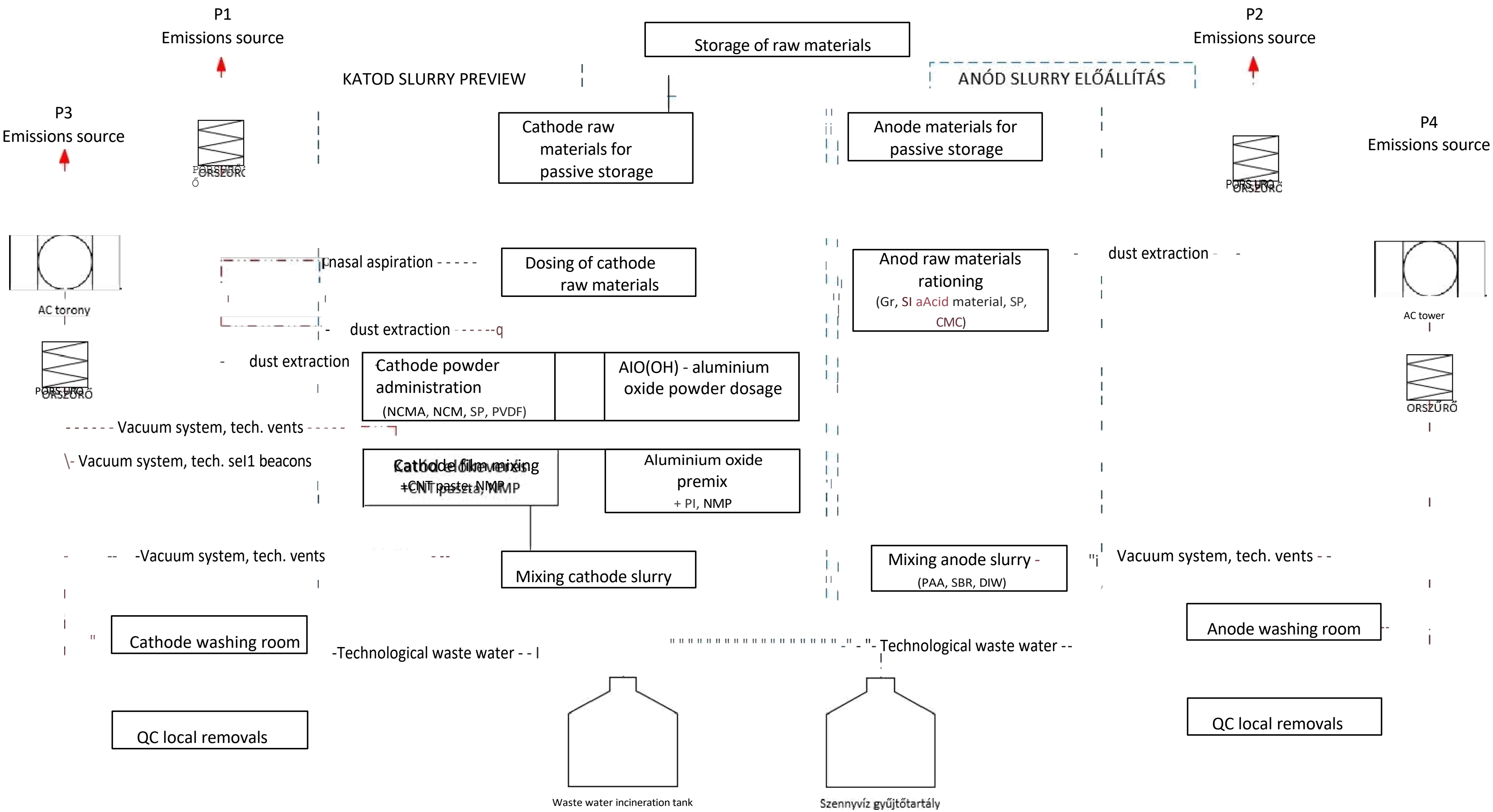
Production of cathode and anode slurry

The technological process starts with the production of the so-called slurry. The anode side and cathode side slurry are produced in a separate production process. The cathode slurry is produced to the north of the longitudinal (K-NY) central axis of the EL building, the anode slurry to the south. The technological process is basically the same for the production of anode and cathode slurry. In both cases, the first step of the process is the formulation of the solid raw materials in powder form (active substances, binders and additives). The individual powders are delivered in bulk (bags, big-bags). The main raw materials (NCMA, NCM for cathode; graphite for anode) are measured via closed automatic bag openers with separate suction, while additives and binders are measured via closed manual feeders with separate suction. Additives in liquid form are measured from closed drums in booths with separate suction. For both powder and liquid additives, dosing is carried out within closed units with their own suction. All feedstocks are stored passively in the cathode and anode unpacking rooms of the EL building 2F prior to the weighing process and are only disturbed during weighing.

The sampled powders are transferred from the sampling tanks via a screw feeder to the mixing tanks located on the ground floor, where the liquid solvents (NMP on the cathode side, purified water (DIW) on the anode side, PAA) are added to these powders in a closed system. The so-called slurry is mixed in different types of mixing equipment through several phases until the desired consistency is reached. The technological process is carried out on 3 to 3 lines on both the anode and cathode sides.

During the manufacturing process, dust is fed through closed inlets with their own extraction system, dust transported by a pulley and a closed vacuum system, the extraction is combined separately at the anode and cathode ends and is discharged to a dust collector located on the roof above the inlet room, where the dust particles in the air stream are separated and released to the environment (P1 and P2 emission point sources).

During the mixing process, the individual process equipment must be kept under vacuum, the associated vacuum system and the process vents on the anode and cathode side are also routed to 1-1 separator (P3, P4 emission point source). This separation system is a two-stage separator, consisting of 1 dust collector for the separation of dust particles in the air stream in the first stage and a redundant activated carbon tower for the separation of pollutants in the air stream (cathode: cathode dusts, NMP, anode: anode dusts) in the second stage. The present solution ensures that there no uncontrolled emissions of any harmful substances from the process The redundant activated carbon towers ensure that the separation process can be carried out continuously even in case of necessary maintenance (charge change). On the anode side, the solvent used in large quantities is DIW, which is in fact purified water with a purity level meeting the requirements of the technology, and in small quantities is PAA, which is the stable aqueous solution of polyacrylic acid, at this stage of the technology, since mixing takes place at room temperature, so that no evaporation of PAA is expected.



7. Figure 3: Production of cathode and anode slurry

The technology involves inerting each piece of equipment with nitrogen. The equipment is classified as pressure equipment and is covered by the PED Directive. The equipment is subject to regulatory supervision and is subject to a third party (NoBo) take-over, which ensures the continuous monitoring of each piece of equipment. The piping system must be constructed with increased safety seals (spiral seals) to prevent leaks. At the sampling points, the use of a stainless steel damage protection tray is required for sampling, and sampling is carried out in a closed system. The use of a leakage protection cuff is required for joints that are to be released frequently. Safety systems are provided minimise the risk of accidental spillage. The anode and cathode suspension produced as a result of the is transferred to the coating line through a closed stainless steel piping system. No chemical reaction takes place during the production process, no new material is generated, only physical mixing takes place, so no new pollutant is generated during the technological process. The tanks and filters cleaned with purified water, and the effluent from the cleaning process is piped to the plant's wastewater treatment plant. The quality control of the resulting suspensions is carried out in laboratories within the building, and the effluent from the laboratories is discharged to the on-site wastewater treatment plant in the PS building, also through a closed pipe system. The ventilation air from the laboratories and washrooms is discharged to the P3 and P4 emission point sources after two-stage activated carbon separation.

In technology, both on the anode and cathode side, regular cleaning of each piece of equipment is necessary. The effluents generated after cleaning are collected separately on the anode and cathode side (type A and B effluents). These contaminated cleaning effluents are collected separately (anode-cathode) in stainless steel settling tanks with a liquid-tight, chemically resistant coating and a concrete outer protective lining with a liquid-tight, chemically resistant coating, which act as a damage-saver, located inside the EL building near the production line (washing rooms), from where they are pumped to the wastewater treatment plant. A leak detector will be installed between the concrete and stainless steel parts of the structure. The sludge generated in the settling tanks will be transferred to the DW building for storage in IBC tanks.

The cathode and anode mixing rooms will be covered with stainless steel.

Coating and drying of anode and cathode

The cathode slurry is buffered at the cathode coating line and the anode slurry at the anode coating line in closed, double-walled stainless steel tanks. The slurry is applied on aluminium foil on the cathode side and on copper foil on the anode side. The aluminium and copper foils are fed in rolls into the machine, the slurry is spread evenly over the surface of the base foil (single-sided coating machine) - by an automatic device. The equipment uses a "thin-roll" coating technique, connected by a supply pipe to the slurry stored in closed, double-walled stainless steel tanks. After coating, the film enters the furnace where it dries out, the NMP (cathode side) and water (anode side) in the coating are evaporated. The PAA on the anode side evaporates in small amounts at the drying temperature, so its appearance is expected at the respective point sources. The drying process uses circulated hot air, the air is heated via hot oil heat exchangers. The slurry is applied to the other side of the film coated on one side using the same technology as described above, and the solvents are evaporated from it as described. The result of this technological step is a base roll of film coated on both sides.

One side of the film is coated on coating part A, while the other side is coated on coating part B (i.e. both sides of the film coated).

open technology, so the applicators are separated from the room and have their own local exhaust. The air exhausted from the coating rooms is discharged to the NMP condensing system NMP separator on the cathode side and to the AC tower on the anode side. Each row (3 cathode + 3 anode) has one separator of its own, with NMP separation on the cathode side by a gas scrubber (P6, P7, P8) and separation on the anode side (no NMP use on the anode side) by an AC tower (P10, P11, P12). In order to achieve high efficiency NMP capture, a multi-stage gas scrubbing system combined with a special activated carbon scrubber will be installed upstream of the emission points (P6, P7, P8).

The process of cleaning the exhausted polluted air on the cathode side is described below:

- Passage of contaminated air through a double plate heat recovery unit after mechanical pre-filtration. Pre-cooling is provided by air exiting the ambient discharge cooler after the activated carbon bed. If the ambient air temperature is lower than the emission air temperature, direct heat exchange pre-cooling is performed with ambient air until the freezing point is reached
- The contaminated precooled air on the primary side is precooled by direct cooling. Achievable efficiency in winter is about 40%. Pre-cooling is achieved via an automatically controlled damper. Operating temperature from outside air: +1 to +10°C. Beyond these ambient temperatures, pre-cooling takes place with purified cold air.
- The contaminated air is passed through the cold water cooling calorifier 1, into which cold water is circulated from the phase 2 tower, further pre-cooling the contaminated air
- The polluted air is introduced into the first phase tower. Here, a countercurrent aqueous contact scrubbing is performed, absorbing the solvents in the polluted air. After the first phase, the cleaning rate is 40-55%.
- The air from phase 1 is passed through the cold water cooling coil 2, which cools the air pre-cleaned in phase 1 to 8-12 °C
- The cooled air is introduced into the phase 2 absorber tower, where the residual pollutant is also removed from the air by countercurrent contact washing. As a result of the cold air and the countercurrent water scrubbing, the gas scrubber water will cool down to a temperature of 10-14 °C, ensuring maximum absorption efficiency.
- The gas scrubber water is kept below 10 °C by forced cooling
- After the phase 2 scrubbing, the air is passed through a phase 3 cold water condenser unit and an activated carbon afterfilter, and after the double plate heat recovery pre-cooler unit, it is discharged to the open air with an emission below the limit value (below 1 $mg/m^{3)}$
- The wash water of the phase 2 cold water system is less polluted and therefore suitable for pre-cooling the air in the first phase by feeding it into the pre-cooling calorifier before phase 1.
- The system is equipped with a real-time emission measurement system to ensure continuous NMP emissions below 1 mg/m^3.
- The resulting effluent is discharged into the contaminated NMP tanks.

As a result of the drying process, the solvents evaporated, so no NMP evaporation is expected for rest of the technology.

Solvent detectors are installed in the furnaces to ensure that the solvent vapour concentration inside the furnace is within a safe range and within controlled limits. As solvent vapour concentration increases, the amount of fresh air injected is increased while the amount of recirculated air is reduced. The NMP-contaminated air stream exhausted from the furnace is continuously cooled, and the NMP recovery unit is sized to recover 99 % of the NMP injected during the coating process. The recovered NMP is then disposed of in contaminated NMP storage tanks in the NMP tank farm. The contaminated NMP will be pumped back to the NMP tank farm through closed stainless steel piping. The gas phase of the air stream to be discharged will be treated with a wet scrubber, as NMP is highly soluble in water, so that NMP concentrations below 1 mg/m^3 can be at the system outlet. The furnaces are closed and , so that no NMP evaporation is expected in the space around the furnace. On the anode side, the final gas separated on redundant activated carbon (AC) towers, which capture a significant part of the pollutants in the air stream during the forced flow through the adsorbent. For quality assurance reasons, local dust extraction is provided at several points in the technology, with process dust extraction being routed to dust filters and AC towers, separately at the anode and cathode lines (point sources P5 and P9). No recirculated process extraction to the room occurs in this part of the technology.

After the drying process, the thickness of the deposited layer is tested by X-ray for the cathode film and by β-ray source for the anode film for quality control purposes. In both cases, as mentioned above, the equipment used is a sealed source, which does not emit radioactivity to water or air, within the scope of Decree 15/2001 (VI. 6.) of the Ministry of Economy and Labour on radioactive discharges into air and water and their control.

Pressing and cutting (calendaring)

After drying, the coated films are pressed to improve the quality of the coating and the edges of the films are then cut lengthwise. The pressing and cutting of anode and cathode films are carried out in separate rooms, where 6 to 6 pieces of pressing and cutting equipment are installed. The equipment and the room are equipped with dust extraction in several places to ensure high quality, the extracted air is partially recirculated to the room after central dust extraction. Prior to recirculation, the airflow is subjected to 99.99% efficient dust separation, resulting in concentrations below the measurement limit in the recirculated airflow, which is continuously monitored for dust content, thus ensuring that the limit values for workplace air according to ITM Decree 5/2020 (II. 6.) are fully complied with. The pre-filtration used in the system is performed by cartridge Teflon membrane, H13 filter and dust filtration units with H14 after-filters before recirculation, ensuring that particles of up to 0.1 µm in the air stream are removed with 99.99% efficiency. HEPA is made of very fine organic fibres, characterised by high particle capture, small pore size, high adsorption capacity, outstanding cleaning efficiency. A continuous, high-volume air exchange is required in the room to ensure production quality and to meet the cleanroom requirements. Recirculation is carried out the dust separation technology described above to ensure that no dust is emitted through the normal ventilation system. In all process systems where the nature and extent of the dust load does not allow recirculation, the air stream is routed to an emission point source after treatment. The production of the electrode associated with the EL building of the technology is completed with this process.

7.1.1.1. Materials used in slurry production

4. Table 3: Materials used in slurry production

Material name	Key features, role in battery production role	Environmental factors
Catodust 1. Lithium nickel cobalt manganese aluminate (NCMA) 2. Lithium Nickel Cobalt Manganate (NCM)	- black/blue non-combustible powder - mixture is classified as hazardous. - mixed metal oxide - the active material of the positive electrode (cathode) - the main powdered component of the cathode-side slurry - is composed of cations of the chemical elements lithium, nickel, cobalt and aluminium - solid, in powder form for administration - stored passively in powder form at the plant until use - present in the technology as a suspension after mixing with NMP, CNT, SP and PVDF - solidifies after drying of the films to form a coating Occurrence in powder form: - quality control laboratories - warehouses - Suspension in measuring tanks Occurrence in suspension: - mixing equipment - coating tanks - drying oven Occur as a solid coating: - cathode on electrode	- some of the lithium-nickel-cobalt-manganese-aluminate is sent to the scrap tonne drum - occurs in the effluent/waste water from cathode slurry - is discharged into the wastewater during the treatment process, which is treated in the on-site wastewater treatment plant - there is a small amount of spraying during the administration, the exhaust air is released into the environment after treatment - during mixing, slight spraying may occur during aeration of the tanks, process exhausts are discharged after treatment - during the cutting of the foil, the cutting processes have separate extraction, the extracted air is released into the environment after treatment - a small amount of cathode dust is bound on the surface of the scrapped pole pieces and is deposited in the waste storage - may be discharged into the laboratory effluent during the quality control process, the entire laboratory effluent is discharged to the on-site wastewater treatment plant through a closed system
Conductive paste (SP)	- black explosive dust - not classified as a dangerous substance or mixture under EC Regulation 1272/2008 - solid, in powder form for administration - stored passively in powder form at the plant until use - After mixing with NMP, CNT, cathode powders and PVDF, it is present in the technology as a suspension on the cathode side - anode side is also present in the slurryben with graphite, with silicone mixed with CMC and water	- a part of the SP goes into the discarded tonne drum - SP occurs from the anode and cathode slurry from the slurry in waste water/waste - is discharged into the wastewater during the treatment process, which is treated in the on-site wastewater treatment plant - there is a small amount of spraying during the administration, the exhaust air is released into the environment after treatment - the mixing during the tanks

		ventilation during slight

Material name	Key features, role in battery production role	Environmental factors
	- solidifies after drying of the films to form a coating Occurrence in powder form: - quality control laboratories - warehouses - Suspension in measuring tanks Occurrence in suspension: - mixing equipment - coating tanks - drying kiln Occurrence as a coating: - anode and cathode on electrode	dusting may occur, technological fumes are emitted after treatment - during the cutting of the foil, the cutting processes have separate extraction, the extracted air is released into the environment after treatment - small amounts of SP are bound on the surface of the scrapped pole pieces and are deposited in the waste repository - may be discharged to the laboratory effluent during the quality control process, the entire laboratory effluent is discharged to the on-site effluent treatment plant on a closed system

Material name	Key features, role in battery production role	Environmental factors
CNT (suspension)	- CNT is a black powdered carbon nanotube, which is not classified as a hazardous substance or mixture under EC Regulation 1272/2008, dispersed in the CNT NMP to form the CNT suspension - CNT is supplied and used in suspension form - the raw material for the cathode side slurry - the NMP content of the suspension during drying for evaporation is evaporated, CNT remains in the coating Occurrence of CNT as a suspension: - in stock - in a sample tank in a slurry on the cathode side: - mixing equipment - coating tanks - drying oven Occurrence of coating (CNT): - cathode on electrode	- a part of the CNT suspension is sent to the scrap ton drum - CNT occurs in the waste/effluent from the cathode slurry - is discharged into the wastewater during the treatment process, which is treated in the on-site wastewater treatment plant - the small amount of NMP that evaporates during dosing is absorbed and released into the environment after treatment - slight evaporation of NMP during the mixing process when the tanks are vented may occur, process fumes are emitted after treatment - the cutting of the films may release a small amount of CNT, the cutting processes have separate extraction, the extracted air is released into the environment after treatment - small amounts of CNT suspension may be deposited on the surface of the scrapped pole pieces by binding into the waste repository - may be discharged to the laboratory effluent during the quality control process, the entire laboratory effluent is discharged to the on-site effluent treatment plant on a closed system

Polyvinylidene fluoride (PVDF)	- PVDF is a component of cathode-side binder, cathode-side slurry - dust explosion hazard dust - not classified as a dangerous substance or mixture under EC Regulation 1272/2008 Occurrence in powder form: - quality control laboratories - warehouses - Suspension in measuring tanks Occurrence in suspension: - mixing equipment - coating tanks - drying kiln Occurrence as a coating: - cathode on electrode	- a part of the PVDF goes into the scrap ton drum - PVDF occurs from waste cathode slurry from in waste water/waste - is discharged into the wastewater during the treatment process, which is treated in the on-site wastewater treatment plant - there is a small amount of spraying during the administration, the exhaust air is released into the environment after treatment - during mixing, slight spraying may occur during venting of the tanks, process exhausts are discharged after treatment - during the cutting of the foil, the cutting processes have separate extraction, the extracted air is released into the environment after treatment - small amounts of PVDF are bound on the surface of the scrap poles and are disposed of in the landfill - may be discharged to the laboratory effluent during the quality control process, the entire laboratory effluent is discharged to the on-site wastewater treatment plant through a closed system
Graphite	- anode-side active substance, main powdered component of anode-side slurry - dust explosion hazard dust - not classified as a dangerous substance or mixture under EC Regulation 1272/2008 Occurrence in powder form: - quality control laboratories - warehouses - Suspension in measuring tanks Occurrence in suspension: - mixing equipment - coating tanks - drying kiln Occurrence as a coating: - anode on electrode	- some of the graphite is put into the scrap tonne drum - graphite occurs from waste anode slurry from in waste water/waste - is discharged into the wastewater during the treatment process, which is treated in the on-site wastewater treatment plant - there is a small amount of spraying during the administration, the exhaust air is released into the environment after treatment - during the mixing process, slight spraying may occur during the aeration of the tanks, the technological
Material name	**Key features, role in battery production role**	**Environmental factors**

		withdrawals are released after treatment - during the cutting of the foil, the cutting processes have separate extraction, the extracted air is released into the environment after treatment - small amounts of graphite are bound on the surface of the scrap pole pieces and are deposited in the waste repository - may be discharged to the laboratory effluent during the quality control process, the entire laboratory effluent is discharged to the on-site effluent treatment plant on a closed system
Material containing silicone	- anode side slurry component - dust explosion hazard dust - not classified as a dangerous substance or mixture under EC Regulation 1272/2008 Occurrence in powder form: - quality control laboratories - warehouses - Suspension in measuring tanks Occurrence in suspension: - mixing equipment - coating tanks - drying kiln Occurrence as a coating: - anode on electrode	- some of the silicone-containing material is sent to the scrap ton drum - The silicone-containing material occurs in the waste water/waste from the waste anode slurry - is discharged into the wastewater during the treatment process, which is treated in the on-site wastewater treatment plant - there is a small amount of spraying during the administration, the exhaust air is released into the environment after treatment - during mixing, slight spraying may occur during aeration of the tanks, process exhausts are discharged after treatment - during the cutting of the foil, the cutting processes have separate extraction, the extracted air is released into the environment after treatment - small quantities of Silicone are bound on the surface of the scrap pole pieces and are deposited in the waste storage - may be discharged to the laboratory effluent during the quality control process, the entire laboratory effluent is discharged to the on-site effluent treatment plant on a closed system

Material name	Key features, role in battery production role	Environmental factors
Carboxymethyl cellulose (CMC)	- anode side slurry component - dust explosion hazard dust - not classified as a dangerous substance or mixture under EC Regulation 1272/2008 Occurrence in powder form: - quality control laboratories - warehouses - Suspension in measuring tanks Occurrence in suspension: - mixing equipment - coating tanks - drying kiln Occurrence as a coating: - anode on electrode	- a part of the CMC is sent to the scrap tonne drum - CMC occurs from waste anode slurry from in waste water/waste - is discharged into the wastewater during the treatment process, which is treated in the on-site wastewater treatment plant - there is a small amount of spraying during the administration, the exhaust air is released into the environment after treatment - during mixing, slight spraying may occur during venting of the tanks, process exhausts are discharged after treatment - during the cutting of the foil, the cutting processes have separate extraction, the extracted air is released into the environment after treatment - small amounts of CMC are bound on the surface of the scrap pole pieces and are deposited in the waste storage - may be discharged into the laboratory effluent during the quality control process, the entire laboratory effluent is discharged to the on-site wastewater treatment plant through a closed system
Industrial cleaner	Material used in small quantities for daily cleaning. It is stored in separate fireproof cabinets. Available at the point of use only in the quantities required for the process. Place of use: - laboratories - laundry room	Wastewater from cleaning operations is discharged to the on-site wastewater treatment plant through a closed system Empty plastic bottles are collected as hazardous waste Cleaning is carried out with local exhausts connected to emission sources with a separator
N-methyl-2-pyrrolidone (NMP)	- cathode slurry solvent Occurrence of in technology pure as NMP: - clean NMP buffer tanks - dosing tanks Occurrence a in technology as a slurry:	- NMP occurs in the waste cathode slurryben - is discharged into the wastewater during the treatment process, which is treated in the on-site wastewater treatment plant - the mixing during the tanks

		ventilation during slight
Material name	**Key features, role in battery production role**	**Environmental factors**
	- mixing equipment - coating tanks - coating applicator - drying oven Incidence of technology waste as NMP: - drying oven - NMP condensation equipment - waste NMP storage tanks In the drying ovens, NMP is evaporated, in the cathode films NMP is no longer present	evaporation occurs, process exhausts are discharged after treatment - large quantities of NMP are found in NMP condensation units and as waste NMP in storage tanks - may be discharged to the laboratory effluent during the quality control process, the entire laboratory effluent is discharged to the on-site wastewater treatment plant on a closed system

Styrene-butadiene rubber (SBR)	- SBR is a rubber-based powder, which is not classified as a hazardous substance or mixture under EC Regulation 1272/2008, SBR is dissolved in purified water to form an SBR suspension. The SBR suspension is used on site. - SBR suspension is used in the production - raw material for the anode side slurry - the water content of the suspension during drying for evaporation is removed, the SBR remains in the coating. Occurrence as SBR suspension: - in stock - in a sample tank in anode-side slurry: - mixing equipment - coating tanks - drying oven Occurrence of coating (SBR): - anode on electrode	- a part of the SBR suspension is sent to the scrap ton drum - SBR occurs from the waste anode slurry from the waste anode in waste water/waste - is discharged into the wastewater during the treatment process, which is treated in the on-site wastewater treatment plant - small amounts of vapours evaporating during administration are extracted and released into the environment after treatment - during mixing, small amounts of vapours may evaporate during the venting of the tanks, process exhausts are discharged after treatment - during the cutting of the films, a small amount of SBR may be spilled, the cutting processes have separate extraction, the extracted air is released into the environment after treatment - small amounts of SBR suspension may be deposited on the surface of scrapped pole pieces by binding into the waste store - may be discharged to the laboratory effluent during the quality control process, the entire laboratory effluent is discharged to the on-site wastewater treatment plant on a closed system
Boehmite	- anode side slurry component - no dust explosion hazard dust	- some of the boehmite is scrapped into a barrel of one tonne
Material name	**Key features, role in battery production role**	**Environmental factors**

	- not classified as a dangerous substance or mixture under EC Regulation 1272/2008 Occurrence in powder form: - quality control laboratories - warehouses - Suspension in measuring tanks Occurrence in suspension: - mixing equipment - coating tanks - drying kiln Occurrence as a coating: - anode on electrode	- boehmite occurs from waste anode slurry from the waste anode in waste water/waste - is discharged into the wastewater during the treatment process, which is treated in the on-site wastewater treatment plant - there is a small amount of spraying during the administration, the exhaust air is released into the environment after treatment - during mixing, slight spraying may occur during aeration of the tanks, process exhausts are discharged after treatment - during the cutting of the foils, the cutting processes have separate extraction, the extracted air is released into the environment after treatment - small amounts of boehmite are bound on the surface of the scrap pole pieces and are deposited in the waste storage - as coating material on the surface of scrapped coated pole pieces, as part of the coating material, to be disposed of in the landfill - may be discharged into the laboratory effluent during the quality control process, the entire laboratory effluent is discharged to the on-site wastewater treatment plant through a closed system
Polyacrylic acid (PAA)	- anode side slurry component - superabsorbent polymer of acrylic acid in the form of a suspension in water with a cross-linking agent Occurrence as a raw material - in dosing tanks - coating tanks - in anode side slurry Occurrence as coating: - anode on electrode	- part of the PAA is sent to the scrapped tonne drum - PAA occurs at the waste anode from slurry generated in waste water/waste - is discharged into the wastewater during the treatment process, which is treated in the on-site wastewater treatment plant - only occurs in a liquid-suspended form, so no spillage occurs - can be released into the laboratory effluent during the quality control process, the complete laboratory wastewater the plant

Material name	Key features, role in battery production role	Environmental factors
		is discharged to a wastewater treatment plant on a closed system
Aluminium foil	Occurrence in technology as pure Al foil: - warehouses - buffer storage - quality control laboratory Occurrence a technology coated (cathode slurry) Al foil: - a full technology in line from coating application - is part of the battery	- as waste foil as pure Al foil or coated Al foil occurring in the waste store - in small quantities in the form of powder during cutting aluminium may be present, which dust on a dust extraction system and the airflow is used to separate the dust after removal discharged - aluminium foil from foil cutting strips, vacuum system are drained and collected, the waste streams are stored in waste containers are stored in
Copper foil	Occurrence in technology as pure copper foil: - warehouses - buffer storage - quality control laboratory Occurrence a technology as anode slurry coated copper foil: - a full technology in line from coating application - is part of the battery	- as scrap foil as pure copper foil or coated copper foil in the scrap store - during foil cutting, small amounts of copper can be released in the form of dust, which is extracted by a dust extraction system and the air stream is used for dust separation after removal is discharged - the copper foil strips from the foil cutting process are removed and collected in a vacuum system, the waste strips are stored in the waste containers are stored in
DIW	Purified process water, DIW is the anode slurry raw material The DIW is produced in the process water preparation system in the PS building, the process water is produced from industrial dilution water, its RO and EDI cleaning	none

Waste management

Wastes generated during the technological process:

- paper, plastic and wood packaging waste (some of which is hazardous because of the substances it contains)
- hazardous waste generated during testing and equipment maintenance
- slaughter waste

The non-hazardous packaging waste is planned to be collected in the waste collection area inside the building, and at the end of the shift it is planned to be transported and stored outside the building in designated areas.

Hazardous packaging waste, small quantities of hazardous waste from laboratories and any rejects from technological processes are planned to be stored in the DW building.

Aluminium and copper foil, as well as cutting dusts, as cutting waste. Of the cutting waste, clean foil is planned to be collected and stored separately. All cutting processes will be dust extraction, with dust collectors separating the cutting dust from the extracted air stream, the dust collectors having their own dust collection tanks. The dust collection tanks are emptied at regular intervals and transported in sealed packaging to the central hazardous waste collection building (DW building).

During maintenance, waste rags and gloves, waste oil and other waste are also generated in this area. The waste generated is planned to be collected in separate areas within the building, near the production lines, and transported to the central non-hazardous waste collection areas and the central hazardous waste collection building (DW building) at the end of the shifts.

Logistics EL-AS

Incoming goods from the RM warehouse arrive on a roller conveyor, in sealed factory packaging, on a bridge connecting the two buildings. On arrival at the EL area, the raw material pallets are transferred to a discharge buffer from where they are transported by a standard pallet forklift truck of the automated forklift system (AGV).

The AGV system transfers the pallets to the unloading area. In the unloading area, the pallets are stored in a layer on the ground in a defined order. From here, the raw material bags and big bags are fed in whole pallet quantities to the raw material loading workshop. The big-bags are emptied by means of a treadmill lift.

The foil and component workpieces to be used arrive from the EL plant floor. The electrode raw material foil and parts are delivered via a closed freight elevator. On the output side of the load lifters, a discharge conveyor section will be set up, from where the foil rolls will be moved by a roll handling AGV and the parts by a skid-steer pallet lifter AGV.

During the processing of the reels, the AGV reel mover performs the transfer between the machines. The small roll transfer is done by an AGV with a lifting beam. This AGV transports the small slit coils, takes them to the infeed point of the temporary automatic storage system, picks them up and transports them to the laser slitting and rewinding.

In the ground floor production area, the AGV movement zone is designated for one-way or two-way traffic. AGV forklift trucks are autonomous within their designated movement zone and within their transport relation. AGVs are

are located by navigation points placed along their route. AGV forklifts are equipped with active collision protection in both the forward and rotating directions. AGVs provide a visual indication of their movement and stop if an obstacle is detected. AGV systems designed with fork lifts have the direction of travel opposite to the fork.

When AGVs are low on charge, they automatically proceed to a charging point, where the connection to the charging point is made automatically

The empty big-bag rolls and the wooden pallets for transport are returned to the unpacking area, from where they are taken to the waste disposal route.

Havaria treatment

The EL building contains large quantities of liquids up to drying technology. After the drying process, no large quantities of liquids are present in the technology. In the case of small quantities (a few decilitres) of materials used for cleaning and maintenance purposes, any spillage can be efficiently and quickly mopped up. In all places where any kind of cleaning or maintenance fluid is used, a spill emergency spill kit (, rags, etc.) appropriate to the chemical is placed. Only bottles in use may be kept in a damage control tray in the area of use. Unopened cylinders will be stored in cabinets with their own damage control trays.

The rooms for the new and contaminated stainless steel NMP buffer storage tanks in the EL building are of a damage-resistant design, part of the building with HDPE sheeting with a leak detection system. A liquid detector will be installed in the containment room to provide an audible and visual alarm in the event of a spill. The containment will have a continuous, liquid-tight and chemically resistant (epoxy) envelope. Above the HDPE film system, the containment will be constructed of liquid barrier concrete with a coating that is resistant to stored chemical for at least 24 hours. The primary consideration in the design of the containment structure is to provide a suitable containment surface for the epoxy coating to be applied and accordingly its crack width is a key design parameter, which is always specified on the basis of the crack resistance of the coating. The liquid sensors installed will provide an immediate signal, immediate intervention. The liquid sensor signals will be incorporated into the BMS system and in the event of a leak, the technology system will be automatically shut down and shut down. The fluids are transported through closed stainless steel pipelines. The pipelines are pressure tested according to standard specifications before commissioning. A non-destructive test coverage exceeding the standard specifications will be required for pipelines with dangerous charges. Steel pipelines shall be of welded design only (seamless or longitudinally welded pipe only according to test class TC1), welded joints (welded fittings) are preferred in the design of the piping system, increased performance gaskets shall be used for flanged joints, leakage protection sleeves shall be required at potential leakage points. With these increased technical requirements, the risk of accidents due to leakage or spillage can be minimised, and the additional safety solutions provide for immediate automatic intervention, thus minimising the damage and consequences of accidents. In the hazardous material use areas, ppm gas and/or solvent vapour detectors connected to the BMS system are installed for occupational safety purposes, which in addition to the occupational safety requirements also serve environmental safety, as in the event of a leakage due to evaporation, these detectors also implement an immediate alarm.

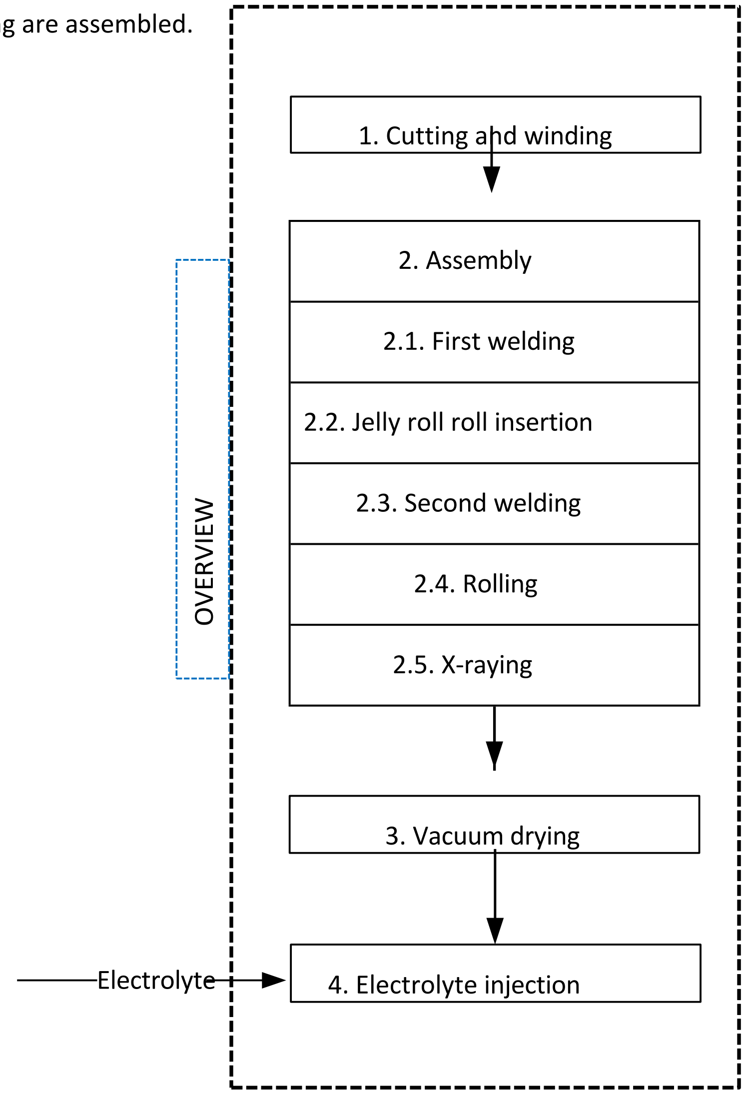
During the production of anode and cathode slurry, the factory unit packs are only disassembled at the dosing stage. The liquid injection chambers have their own damage suppressor so that during a spill, the spillage is contained in the damage suppressor. The process system is closed and the tank and pipeline cleaning processes are also carried out in a closed system. In the case of joints that are frequently dissolved, the installation of a leakage protection cuff is required. The system is interruptible and the valves are closed in case of failure. The tanks installed are pressure equipment and are subject to official supervision. The safety systems provided the risk of accidents resulting from spillage from the system. For the design of the process systems, the requirements set out in the previous paragraph are required for the entire process system, including the production of anode and cathode slurry. Hazardous liquid charge process equipment without a damage suppressor shall be of double-walled design, the equipment material being in all cases chemically resistant to the charge.

In all cases, the rooms will be equipped with a chemically resistant, liquid-tight, floor covering that is resistant to the particular material stored and/or used (the receiving surface will be designed to ensure the long-term suitability of the coating system used), with a damp-proof drain in front of the doors. Floor drains connected to a public sewer will not be installed in the process rooms.

Automatic liquid containment barriers will be installed at the doors of the rooms in the building where foam-extinguished dangerous substances are used or stored. This will prevent the release of hazardous substances and inoculants into the environment.

4.3.2. AS building

During the assembly process, which takes place in the AS building, the anode and cathode electrodes (coated foils) produced in the EL building are assembled.



8. Figure 1: The assembly technology process

4.3.2.1. Technology description

Cutting and winding

The first technological step in the AS building is laser cutting. After the welding lugs are formed, the assembly operation follows, during which the cathode electrode, the separator and the anode electrode are wound together. The separator is used to separate the anode and cathode. A total of 54 slitting and winding machines are installed in the room. As a final step in the process, a tape with a QR code and other information will be placed on the so-called jelly roll (coiled cathode, anode, separator), which will also ensure subsequent positioning and traceability. The equipment is equipped with extraction for cutting fume extraction and quality assurance reasons. The contaminated air streams extracted during laser cutting are after separation is discharged to the environment (P13-P20). The air stream exhausted from the marking equipment is also discharged to the environment after separation (P21). Solid waste from the cutting process is removed by vacuum transport.

During the winding process, the prepared cathode electrode, anode electrode, separator (polypropylene and polyethylene composite material) winding tape is wound into a cylindrical roll.

Assembly

The assembly process involves welding the assembled rolls (jelly rolls) together and inserting them into the casing. During the process, the casing is marked with a marking ink. The assembly process consists of several operations, each of which is carried out at a separate workstation. The assembly processes are carried out on 3 parallel twin lines. The final step in the process is X-ray inspection, during which the required parameters of the product are checked.

During the technological processes, welding fumes are separately extracted and after separation are discharged to the environment (P22, P23, P24). The air stream from the vacuum system and the exhausts from the marking equipment are also discharged to the environment after treatment (P26).

Vacuum drying

The formed cells are placed in a vacuum oven inerted with nitrogen, where they are dried at 100 °C at -0.09 MPa to remove any residual moisture. The process primarily removes vapour from the manufacturing process, but residual solvent vapours may also be present and the vacuum furnace exhaust point is discharged to a separator and released to the environment. In total there are 24 vacuum furnaces in the process. Two units have a common extraction with a capacity of 70 m^3/h for the vacuum system 3,300 m^3/h for the dust extraction, all vapour/gas/exhaust generated during vacuum drying is discharged to the environment after separation (P25).

Small amounts (<<1l/day) of condensate may be generated in the vacuum furnaces and are collected separately with the waste cathode slurry.

Electrolyte injection

In the dried cells, the next process step is the injection of electrolyte. A total of 3 double-row injection lines will be set up. The entire injection equipment will be separated from the room and will have its own local exhaust, the exhaust air flow will be directed to an activated carbon separator before being discharged to the environment (P27, P28, P29). The vacuum extraction points used for the technology will also be discharged to the environment via these AC towers.

The cells are fed into the injection plant by an automatic conveyor. The electrolyte is pumped in from the electrolyte buffer tanks inside the building via a closed pipeline. The first step in the process is to measure the cells, then place them in trays, and after the air tightness test, the electrolyte is injected into the cells. The electrolyte is injected by pressure into a temporary buffer storage tank inside the cabin. After injection, the cells on trays are placed in resting chambers/tanks. The holding tanks (7 per row) are pressure vessels inerted with nitrogen. The cells leave the injection workstation after the quality control process. DMC is used to clean the pipelines on a regular basis and the contaminated DMC generated during the cleaning process is temporarily stored in tanks. The filling openings are sealed with a cap. The entire injection workstation is enclosed and has its own has a ventilation system. The extracted air is directed to 1-1 (3 in total, P27-P28-P29) AC tower per double row, which contains both the process ventilation and the closed cabin room exhaust. The extraction capacity is 35 000 m^3/h per line. The extraction is achieved via a redundant active carbon tower, which allows for in-service replacement and fail-safe operation of the charge.

The electrolyte injection system uses nitrogen to exclude the air, and the nitrogen is supplied by the PSA nitrogen production system located in the PS building.

4.3.2.2. Materials used in the assembly

5. Table 1: Materials used in assembly

Material name	Main properties, in battery production its role in	Environmental factors
Electrolyte	- flammable and explosive liquid - a mixture of dimethyl carbonate (DMC), ethylene carbonate (EC), ethyl methyl carbonate (EMC), vinyl carbonate (VC), lithium hexaflourophosphate - the electrolyte is injected through a liquid injection machine into the into battery - the electrolyte allows lithium ions (Li+) to move between the anode and cathode, stabilising the cathode and anode surfaces, extending battery life and improving cell performance	- electrolyte vapour evaporating during the electrolyte injection process is transferred to an activated carbon separator and the air stream is then discharged to the environment - water contaminated by the technology not generated - a possible spill from the equipment is captured in its own salvage yard, the spilled electrolyte is collected and stored in drums in the hazardous waste container - small amounts of electrolyte appear in scrap batteries - batteries are delivered in trays, during tray cleaning Waste water potentially containing electrolyte is treated in an on-site waste water treatment plant - the tank ventilators on the injection technology's activated carbon towers are connected before the release
Dimethyl carbonate (DMC)	- a constituent of electrolyte - flammable and explosive liquid - the liquid used to clean pipelines and tanks is electrolyte injection technology - stored in inert containers, used in a closed system	- the canister breathers on the injection technology's activated carbon towers are connected before the release - collected in the contaminated DMC tanks after cleaning and storage in the hazardous waste collection area by a third waste treatment facility until delivery to a party

Waste management

Wastes generated during the technological process:

- waste separator film (plastic waste)
- waste anode and cathode foils and scrap metal (powders) from these foils

- waste jelly roll
- semi-finished battery cell waste
- sealing tape waste
- Waste insulating board
- paper and plastic packaging waste
- in connection with maintenance, in addition to the above, there is a risk of generation of waste oil and rags and gloves.

Non-hazardous waste is scheduled to be collected in the waste collection area inside the building and at the end of the shift it is scheduled to be removed and stored in designated areas. Hazardous waste is planned to be stored in the DW building.

Havaria treatment

Until the electrolyte injection technology is used, no hazardous substances in liquid form will be found or used in the AS building. In the AS building, large quantities of liquid phase materials are found at the electrolyte injection technology. In the case of small quantities (a few decilitres) of materials used for cleaning and maintenance purposes, any spillage can be cleaned up efficiently and quickly. In all places where any kind of cleaning or maintenance fluid is used, a spill emergency spill kit (absorbents, rags, etc.) appropriate to the chemical is placed. Only bottles in use may be kept in a damage control tray in the area of use. Unopened cylinders will be stored in cabinets with their own damage control trays.

The room for the stainless steel electrolyte buffer storage tanks in the AS building is a building section with a damage-resistant design and HDPE sheeting with a leak detection system. A liquid detector will be installed in the damage room, which will provide an audible and visual alarm in the event of a spill. The containment will be provided with a continuous liquid tight and chemically resistant, non-sparking (epoxy) coating. Above the HDPE film system, the containment will be constructed of liquid barrier concrete with a coating that is resistant to stored chemical for at least 24 hours. The primary consideration in the design of the containment structure is to provide a suitable containment surface for the epoxy coating to be applied, and accordingly its crack width is a key design parameter, which is always specified on the basis of the crack resistance of the coating. The liquid sensors installed will provide an immediate signal, immediate intervention. The liquid sensor signals will be incorporated into the BMS system and in the event of a leak, the technology system will be automatically shut down and shut down. The fluids are transported through closed stainless steel pipelines. The pipelines are pressure tested according to standard specifications before commissioning. A non-destructive test coverage exceeding the standard specifications will be required for pipelines with dangerous charges. Steel pipelines shall be of welded design only (seamless or longitudinally welded pipe only according to test class TC1), welded joints (welded fittings) are preferred in the design of the piping system, increased performance gaskets shall be used for flanged joints, leakage protection sleeves shall be required at potential leakage points. With these increased technical requirements, the risk of accidents due to leakage or spillage can be minimised, and the additional safety solutions provide for immediate automatic intervention, thus minimising the damage and consequences of accidents. Solvent vapour detectors connected to the BMS system at hazardous material use sites are installed, which, in addition to the safety and explosion protection requirements, also serve environmental safety, since in the event of a leakage, these sensors also provide an immediate alarm due to evaporation.

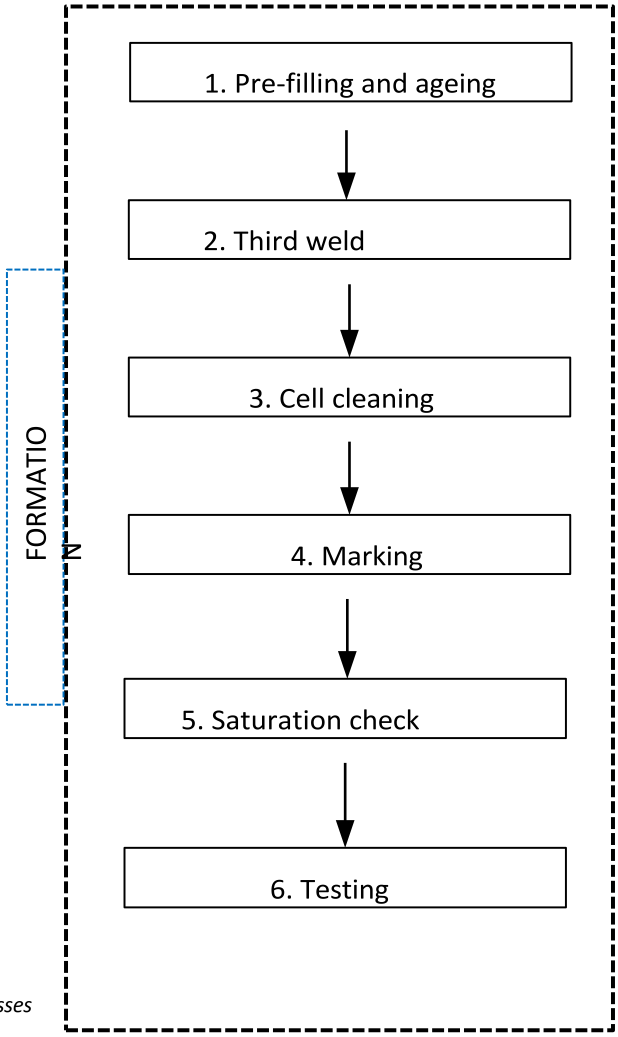
Hazardous liquid storage and/or use equipment associated with electrolyte injection technology shall be of double-walled design or shall be placed on individual stainless steel damage containment trays of containing 100% of the volume of material stored/used. The process system is closed, and the tank and pipeline cleaning processes are also carried out in a closed system. The installation of a leakage protection cuff is required for joints that are to be dissolved frequently. The system is intermittent and the valves are closed in case of failure. The tanks installed are pressure equipment and are subject to official supervision. The safety systems provided shall minimise the risk of accidents resulting from spillage from the system. For the design of the process systems, the requirements set out in the previous paragraph are required for the entire process system.

In all cases, the rooms will be equipped with a chemically resistant, liquid-tight, floor covering that is resistant to the particular material stored and/or used (the receiving surface will be designed to ensure the long-term suitability of the coating system used), with a damp-proof drain in front of the doors. Floor drains connected to a public sewer will not be installed in the process rooms.

Automatic liquid containment barriers will be installed at the doors of the rooms in the building where foam-extinguished dangerous substances are used or stored. This will prevent the release of hazardous substances and inoculants into the environment.

4.3.3. FO building

The FO building is where the moulding technology processes are carried out.



9. Figure 3: Forming technology processes

4.3.3.1. Technology description

Pre-filling and ageing

In the FO building, the first filling of the cells, the so-called pre-filling (9 pieces of equipment) and the removal of the caps will take place. During the pre-charging process, a passivation surface is created on the anode side and small quantities of gases and vapours are evolved in the cell. The process is carried out in a closed cabin with vacuum extraction, which is discharged to an activated carbon separator (P33-P35). The extraction is carried out through a double activated carbon tower, which allows for in-service charge exchange and fail-safe operation.

During the ageing process, the semi-finished batteries are stored at normal and elevated temperatures.

Third weld

After ageing, the batteries are sealed by laser welding. The gases generated during the welding process are released to the environment after separation (P30-P32).

Cell cleaning

The sealed cells are steam cleaned to remove all contaminants. After cleaning, the surface is treated with a rust inhibitor, during which the released vapours are released to the environment after carbon capture (P33-P35). Electric flash steam generators are installed inside the building to clean the cells.

Apply at

After cleaning, a labelling film is placed on the finished battery and the information required for identification is printed on the film. A marking ink is used during the printing process. The small amounts of volatile organic vapours generated during the process are released to the environment after carbon capture (P33-P35).

Saturation check

The air density of the battery is checked with a mass spectrometer. During the process, if there is a sealing defect in the battery cell, trace amounts of electrolyte volatile gas are produced, which are extracted and released to the environment after activated carbon separation (P33-P35).

Testing

At the end of the process, OCV, open circuit voltage test, capacitance test and voltage adjustment are performed.

After these process steps in building FO, the finished battery is produced and transferred to building SO for storage and further testing.

4.3.3.2. Materials used in the formatting

6. Table 3: Materials used in the moulding process

Material name	Main properties, in battery production its role in	Environmental factors
Rust inhibitor	- isoparaffinic solvent oil with calcium petroleum sulphonate - flammable and explosive liquid - it is used to treat finished batteries to prevent them from rusting - only in the quantities required, the material is stored in the technology in damage prevention trays - storage is in a separate room, in its own fire-resistant fireproof cupboard	- evaporating vapours are transferred to an activated carbon separator and the air stream is discharged to the environment - water contaminated by the technology not generated - in the event of a spillage, the material is contained in the storage unit's containment, the spillage is collected and stored in the hazardous waste container
Marking ink	- special ink for the application of markings - stored in the workshops within the building in a refrigerated manner - only the equipment in use in the installation ink is located on the premises	- evaporating vapours from activated carbon are sent to a separator and the air stream is then released into the environment - leakage from the ink reservoir of the equipment cannot be realised

Material name	Main properties, in battery production its role in	Environmental factors
		- the ink must be carefully filled in accordance with the manufacturer's instructions, using a damage prevention tray - a small amount of ink from a possible spillage should be soaked up from the damage recovery tray, and dangerous stored as waste in the DW building

Waste management

Wastes generated during the technological process:

- sealing caps, which are removed before moulding, are collected at a designated place next to the workplace and are then removed at the end of each shift
- municipal waste is collected in containers on the site. The contents of the containers are emptied into bags during daily cleaning and taken to the yard waste collector
- wiping cloths, gloves from maintenance, the waste generated is planned to be collected in separate areas within the building, near the production lines, and transported to the central non-hazardous waste collection areas and the central hazardous waste collection building (DW building) at the end of the shifts.
- discarded batteries (hazardous waste), which are transported to the BS building for dismantling and from there to the BD building for disposal, with the disposed battery being temporarily stored in the DW building
- no hazardous waste is generated in the storage system during operation

Havaria treatment

There are no large quantities of liquid substances in the FO building. There is a small amount of electrolyte in the semi-finished batteries. The semi-finished batteries are stored and transported in damage-absorbing crates, which can contain the total amount of liquid in the batteries. In the case of small quantities (a few decilitres) of materials used for cleaning and maintenance purposes, any spillage can be efficiently and quickly cleaned up. In all places where any kind of cleaning or maintenance fluid is used, a spillage emergency decontamination kit (absorbents, rags, etc.) appropriate to the chemical is placed. Only bottles in use may be kept in a damage control tray in the area of use. Unopened cylinders will be stored in cabinets with their own damage control trays.

In the open semi-finished battery storage rooms, liquid sensors will be installed as an additional protection, providing audible and visual alarms and signalling to the BMS system, allowing immediate spillage response with the discharge kit in place.

The rooms are liquid-tight, chemically resistant spark-proof flooring are constructed (the
the host surface in all cases to ensure the long-term suitability of the coating system used

will be designed), a damp course will be created in front of the windows. There will be no floor drains connected to a public sewer in the process rooms.

Automatic liquid containment barriers will be installed at the openings of rooms in the building where foam-extinguished dangerous substances are used or stored. This will prevent the release of hazardous substances and inoculants into the environment.

4.4. Presentation of the buildings serving the technology

4.4.1. NMP Tank Park (NT building)

The NMP tank farm will contain the new NMP storage tanks needed to serve the technology and the storage tanks for the contaminated NMP to be recovered from the process system.

The tank farm is in accordance with the provisions of the 31/2014 (II. 12.) Korm. Regulation (No. 31.12.2014) - on the rules of the building authority procedures for certain special industrial constructions - special industrial construction as a storage facility for hazardous liquids and melts: a special construction, together with storage tanks, which is a fixed storage tank not classified as a pressure vessel, as defined in the Ministerial Decree on storage tanks for flammable liquids and melts, and which is intended for the direct location or protection of storage tanks for flammable, flammable, corrosive and toxic liquids and melts.

There is no permanent human presence in the NMP tank farm, where only the equipment necessary to service the process system is located. The new NMP and the contaminated NMP will be transported to/from the EL (Electrolyte) building via the pipe bridge on the west side of the tank farm.

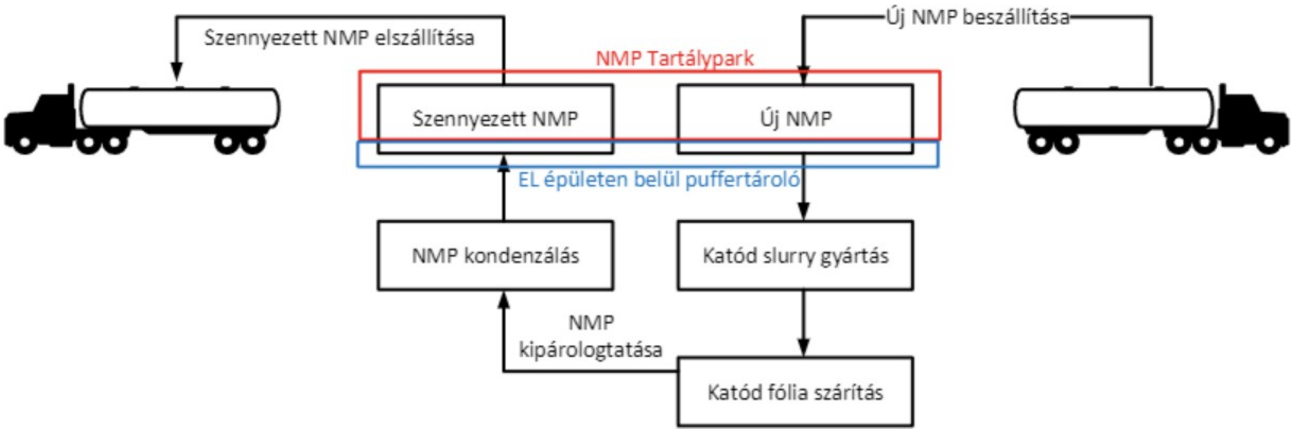
The NMP tank farm can be divided into the following main units:

- Building for storage tanks
- Landing area
- Emergency slop
- Gas scrubber building
- Pump rooms
- Pipe bridge

The NMP tank farm has a dual technological function:

- store new NMP
- storage of contaminated NMP

Both the new NMP storage tanks and the contaminated NMP storage tanks are located within a building with a remediation building. New NMP will be stored in 2 75 m^3 above ground, horizontal cylindrical hazardous liquid storage tanks. The contaminated NMP will also be stored in 2 above ground 75 m^3 horizontal cylindrical hazardous liquid storage tanks. The tanks will be inerted with nitrogen and equipped with all the necessary instrumentation and equipment for safe operation. The tanks are of stainless steel construction, designed according to the specifications of standard MSZ EN 12285-2. The NMP is delivered to the plant in ISO road tankers with 2 75 m^3 horizontal cylinders for the transport of dangerous liquids is placed in a storage tank, from where it is temporarily stored in 2 5 m^3 upright cylindrical tanks inside the EL building, from where it is pumped to the mixing section of the cathode production. In the mixing section of the cathode production, the NMP is fed into mixing tanks where it is mixed with different powders (NCMA, NCM, SP, PVDF, CNT) to form the so-called cathode slurry. The finished cathode slurry is applied to the aluminium foil according to the customer's specifications. The foil is then transferred to a drying oven where the NMP is evaporated from the foil. The evaporated NMP will be condensed and pumped first to buffer storage tanks (2 5 m^3 upright cylindrical tanks) within the EL building and from there to the contaminated NMP hazardous liquid storage tanks located in the NMP tank farm. The contaminated NMP is transported off-site by ISO road tanker.



10. Figure 1: Processes in the NMP tank farm

The new NMP is delivered to the plant by road. During delivery, the transport vehicle drives to the unloading station where the new NMP is pumped into one of the new NMP storage tanks. During the offloading process, the storage tank used for offloading and the ISO tanker are connected by a gas shuttle to prevent NMP contamination escaping into the environment. The transfer of NMP to the buffer tanks inside the EL building is also carried out by means of pumps. The internal buffer tanks are connected to the external storage tanks by a gas fence, so that no NMP is released to the environment during the transfer operation. Since the storage tanks are designed with a gas gas system, no NMP emissions are expected from the storage tanks during operation. However, in accordance with safety regulations, the tanks are equipped with an aeration device, which is connected to the NMP gas scrubbing system on the tank farm site.

The contaminated NMP is transported from the plant by road. During the delivery, the transport vehicle drives to the unloading station where the contaminated NMP is transferred from the contaminated NMP storage tanks to the ISO tanker truck by means of pumps. During the transfer, the storage tank and the ISO tanker are connected by a gas shuttle to prevent NMP contamination from escaping into the environment. The contaminated NMP buffered inside the EL building is transferred to the tank farm by means of pumps. The internal buffer tanks are connected to the external storage tanks by a gas fence, so that no NMP is released to the environment during the transfer operation. Since the storage tanks are designed with a gas gas system, no NMP emissions are expected from the storage tanks during operation. However, in accordance with safety regulations, the tanks are equipped with an aeration device, which is connected to the NMP gas scrubbing system on the tank farm site.

Hazardous liquid containers are located within a containment building, adjacent to which is a discharge area. A steel frame roof structure will be constructed over the entire discharge area to minimise the amount of stormwater entering the areas. The incoming stormwater and, in the event of a disaster, the contaminated liquid from both the remediation and the discharge areas will be discharged into a 40 m^3 stainless steel underground double-walled sludge tank. The discharge area is connected to the slop tank by a gravity underground pipeline, so that the area is automatically drained without external intervention. The underground pipeline is a double-walled, stainless steel welded pipeline with a glycol interstitial space and a leak detection system to prevent soil contamination. The 40 m^3 column tank is located in the southern part of the remediation. The tank is double-walled and equipped with a leak detection instrument according to MSZ 9910-3 3.3.7, so it will be installed without a containment area. The interstitial space of the slop tank will be filled with antifreeze and a leak detector will be installed to monitor the double wall and alert the operator in case of leakage. The maximum filling capacity of the slop tank is 20 m^3, guaranteeing that it can hold a tanker truck load of liquid at any time. The slop tank can be unloaded with an ISO tanker or transferred to the contaminated storage tank. The discharge area is provided with a chemically resistant, liquid-tight enclosure.

The internal surfaces of the containment walls and floors will be liquid tight and designed to withstand the chemical properties of the stored material (NMP). HDPE film bonded to the monitoring well will be installed under the entire containment and discharge area. Along the perimeter of the discharge area, a river will constructed and discharged into a sump, from which any contaminated liquid will be gravity drained to the slop tank via an underground double-walled stainless steel pipeline as described above.

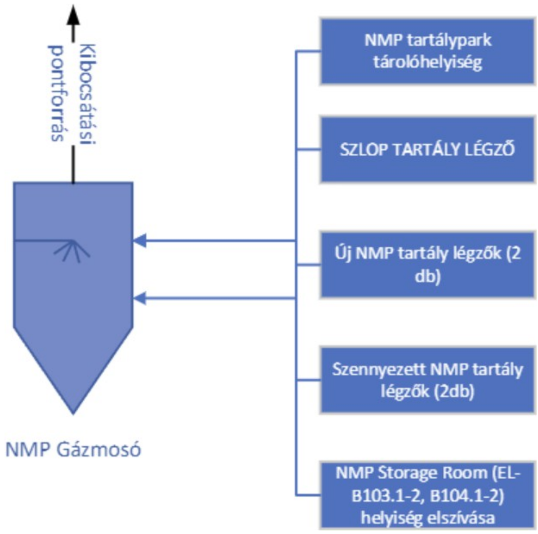
The building's containment area, as the containment area for the building's fire fighting, meets the capacity requirements MSZ 9910-2. One emergency shower will be provided in the discharge area, one each in the north and south of the discharge area.

All potential NMP sources are connected to the NMP scrubber as follows:

- new NMP tank breathers
- breathers for contaminated NMP tanks
- NMP Storage room (inside EL building) extraction
- NMP storage room extraction

Due to the gas inlet design, no significant amount of contaminated volume flow from the tank inlet is expected. Operationally, no NMP emissions are expected to occur within the site, however, NMP emissions are expected during non-operational operation, so both normal and emergency exhaust from the site will be discharged to the NMP scrubber. The NMP scrubber stack is an emission point source (P38).

NMP gas scrubbing system design: 2-phase gas scrubber with active cooling, 2-stage condenser and activated carbon after-filtration. The NMP gas scrubbing system will be located inside the building, part of the switchgear for the electrical operation of the NMP tank farm will also be located in a separate room inside the Gas Scrubber building. The NMP gas scrubber has its own damage tray, so the building does not have its own damage tray.



11. Figure 3: NMP scrubber gas separation system

Due to the gas injection systems in place, large NMP emissions are not expected in the NMP tank farm. The emissions shown in the previous figure will be connected to the P38 emission point source, where the air stream will be treated by a single-stage gas scrubber combined with an activated carbon separator prior to emission, resulting in emissions of NMP being kept well below the limit value.

During the design of the NMP storage tank farm, environmental protection and the protection of groundwater were the primary considerations, and a multi-level spill protection system was developed accordingly:

- in accordance with legal requirements, a liquid-tight, reinforced concrete damage barrier of 50% of the total capacity, with a NMP-resistant, liquid-tight epoxy coating on the surface, the epoxy used shall have a chemical resistance to NMP of at least 24 hours, any spillage must be cleaned up within this time, which involves pumping the spillage a slop tank (underground double-walled stainless steel tank with leak control system) located adjacent to the building and then washing the coating with water. Minor drips should be soaked up immediately, followed by a water wash of the surface and a check of the coating integrity. After any havaria situation the coating should be checked to ensure that it retains its functionality, if damaged the area should not be used until the coating is repaired. Stainless steel damage trays shall be placed under the drain lines. Adequate water storage is required in the area (softening wipers)
- the primary consideration in the design of the host structure is to provide a suitable host surface the epoxy coating to be applied, and accordingly its crack resistance is a key design parameter, which is always specified on the basis of the crack resistance of the coating
- an underground double-walled stainless steel tank with a leakage control system will be installed next to the building, into which any chemical spillage can be pumped in the event of an emergency
- the area will be equipped with a disaster management kit
- a liquid detector will be installed in the damage extinguisher, which will emit an audible and visual alarm in the event of a spill
- integrated fluid sensors provide an immediate signal, allowing immediate intervention. The signals from the fluid sensors are integrated into the BMS system and in the event of a leak, the technology system is automatically shut down and shut down.

- liquids are transported through closed stainless steel pipelines. The pipelines are pressure tested according to standard specifications before being put into service. A non-destructive test coverage exceeding the standard specifications will be required for pipelines with dangerous charges. Steel pipelines shall be of welded design only (seamless or longitudinally welded pipe only according to test class TC1), welded joints (welded fittings) are preferred in the design of the piping system, increased performance gaskets shall be used for flanged joints, leakage protection sleeves shall be required at potential leakage points.
- ppm gas and/or solvent vapour detectors connected to the BMS system will be installed in hazardous material storage areas to , in addition to the safety requirements, environmental safety, as in the event of a leakage, these detectors will also provide an immediate alarm due to evaporation.
- HPDE membrane is installed under the entire containment and discharge area, with a leakage control manhole

  belong to
- the storage tanks and the discharge area are also covered
- the entire building is ventilated by a gas scrubber

The listed safety solutions minimise the possibility of a disaster occurring, but the system is also suitable for handling disaster situations and in the event of a disaster, it provides for immediate intervention, so that the consequences and effects of the disaster on the environment as a whole are minimised and no environmental damage is caused as a result of the multi-stage, combined safety and damage control system, using the best available technology.

4.4.2. Electrolyte Tank Farm (ET building)

The Electrolyte Tank Farm is the site for the storage of the electrolyte raw materials needed to serve the technology.

A tank farm is a specific industrial building as a building of pressure systems within the meaning of Government Decree 31/2014 (12.II.) on the rules of the building authority procedures for certain specific industrial buildings: a specific building directly serving to house or protect pressure equipment and systems together with the pressure equipment or system.

The Elektrolit tank farm is not permanently occupied by people, and only the equipment necessary to service the technological system is located there. The electrolyte is transported to the AS (Assembly Plant) building via the pipe bridge on the eastern side of the tank farm.

The Elektrolit tank farm can be divided into the following main units:

- Building for storage tanks
- Landing area
- Emergency slop
- AC tower
- Pump rooms
- Pipe bridge

From a technological point of view, the Electrolyte Tank Farm has one function, namely the storage of electrolytes to be used as feedstock. The electrolyte is stored in four 50 m^3 above ground pressure vessels and two 25 m^3 above ground pressure vessels. The six pressure vessels will be located within a single room, the room itself serving as a damage containment. Each tank is inerted with nitrogen and is equipped with all the necessary instrumentation and fittings for safe operation. The tanks are of stainless steel construction, designed according to the specifications of the MSZ EN 13445 series of standards. The extinguishing system equipment will be located in separate rooms within the building and the control room will be in a separate room. The electrolyte will be delivered to the plant in ISO road tankers, where it will be transferred either in 4 50 m$^{(3)}$ pressure vessels or 2 25 m^3 pressure vessels, depending on its quality. The building will be heated and cooled a temperature control system and the electrolyte storage room will be kept at a constant temperature of 0°C to 10°C. From the tank farm, the electrolyte will be temporarily stored in three 1.6 m$^{(3)}$ vertical cylindrical pressure vessels inside the AS building, from where it will be pumped to the assembly plant and injected into the batteries. Barrel electrolyte is also stored in the Electrolyte Transfer Rooms within the building and barrel electrolytes can be injected via a transfer station.

Since the storage tanks are designed with a gas gas system, no electrolyte emissions are expected from the storage tanks during operation. However, the process vents of the tanks are connected to the AC tower system in the tank farm area.

Pressure equipment will be located inside the building in an emergency room. The containment capacity of the uptake space (building emergency room) complies with the relevant MSZ 9910-2 standard. A steel-framed roof structure will be constructed over the drainage area to minimise the amount of stormwater entering the areas. The incoming stormwater and, in the event of a disaster, the contaminated liquid that escapes to both the remediation and the discharge areas will be discharged into a 40 m^3 underground double-walled stainless steel sludge tank. The discharge area is connected to the slop tank by a gravity underground pipeline, while the remediation area is connected to the 40 m^3 underground slop tank by transfer pumps. The underground pipeline is a double-walled stainless steel pipeline with a glycol interstitial space and a leak detection system to prevent soil contamination. The 40 m^3 column tank is located in the northern part of the tank area. The tank double walled and equipped with a leak detection instrument according to MSZ 9910-3 .3.7 and will be located without a containment area. The interstitial space of the slop tank will be filled with antifreeze and a leak detector will be installed to monitor the double wall and alert the operator in case of a leak. The ventilation line for the slop tank will be connected to the AC tower system in the area. The maximum filling capacity of the slop tank is 20 m^3, guaranteeing that it can hold a tanker truck load of liquid at any time. The slop tank can be unloaded with an ISO tanker. A single emergency shower is provided in the discharge area.

The internal surface of the walls and floors of the damage shelter will be waterproof and designed to withstand the chemical properties of the stored material (Electrolite). HDPE film will be installed under the entire building and discharge area, bonded to the monitoring well. Along the perimeter of the discharge area, a river will constructed and discharged into a sump, from which any contaminated liquid will gravity drained to the slop tank via an underground double-walled stainless steel pipe as described above. The discharge area will be covered with a chemically resistant, liquid-tight, non-sparking liner.

All potential sources of electrolyte pollution are connected to the AC tower as follows:

- slop tank breather
- electrolyte tank breathers
- ventilation of the electrolyte storage room
- Electrolyte Storage room (inside AS building) extraction

Due to the gas inlet design, no significant amount of contaminated volume flow from the tank inlet is expected. No electrolyte emissions are expected to occur within the room during normal operation, however, electrolyte emissions are expected during non-operational operation, so both normal and emergency exhaust from the room will be discharged to an AC tower. The AC tower will be located outside in the electrolyte storage tank park area.

The AC tower will be composed of two AC storage units and two redundant exhaust fans, so that operation is ensured even in the event of a charge change of activated carbon, and the redundant fans are installed for operational safety. After treatment, the air stream is discharged to the environment (P37).

Environmental protection and the protection of groundwater were the primary considerations in the design of the electrolyte storage tank farm, and a multi-level spill protection system was developed accordingly:

- a liquid-tight, reinforced concrete damage barrier of 50% of the total capacity in accordance with legal requirements, with an electrolyte-resistant, conductive, non-sparking, liquid-tight epoxy coating on the surface, the epoxy coating having a minimum resistance of 24 hours, any spillage must be cleaned up within this time, which involves pumping the spillage to a slop tank (an underground double-walled stainless steel tank with a leak detection system) located adjacent to the building and washing the coating with water. Minor drips should be soaked up immediately, followed by a water wash of the surface and a check of the integrity of the coating. After any havaria situation the coating should be checked to ensure that it retains its functionality, if damaged the area should not be used until the coating is repaired. Stainless steel damage trays shall be placed under the drain lines. Adequate water storage is required in the area (softening wipers)
- the primary consideration in the design of the host structure is to provide a suitable host surface the epoxy coating to be applied, and accordingly its crack resistance is a key design parameter, which is always specified on the basis of the crack resistance of the coating
- an underground double-walled stainless steel tank with a leakage control system will be installed next to the building, into which any chemical spillage can be pumped in the event of an emergency
- the area will be equipped with a disaster management kit
- a liquid detector will be installed in the damage extinguisher, which will emit an audible and visual alarm in the event of a spill
- integrated fluid sensors provide an immediate signal, allowing immediate intervention. The signals from the fluid sensors are integrated into the BMS system and in the event of a leak, the technology system is automatically shut down and shut down.
- liquids are transported through closed stainless steel pipelines. The pipelines are pressure tested according to standard specifications before being put into service. A non-destructive test coverage exceeding the standard specifications will be required for pipelines with dangerous charges. Steel pipelines shall be of welded design only (seamless or longitudinally welded pipe only according to test class TC1), with preference given to

Welded joints (welded fittings), increased performance gaskets for flange joints, leakage protection sleeves required at potential leakage points.

- solvent vapour detectors connected to the BMS system will be installed in hazardous material storage areas, which, in addition to the occupational safety and explosion protection requirements, will also serve environmental safety, as in the event of a leakage, these detectors will also trigger an immediate alarm due to evaporation.
- HPDE membrane is installed under the entire containment and drainage area, with a leakage control manhole

  belong to
- the storage tanks and the discharge area are also covered
- the entire building is ventilated by an active carbon tower

The listed safety solutions minimise the possibility of a disaster occurring, but the system is also suitable for handling disaster situations and in the event of a disaster, it provides immediate intervention, whereby the consequences and effects of a disaster on the environment as a whole are minimised and no environmental damage is caused due to the multi-stage, combined safety and damage control system, using the best available technology.

4.4.3. PS building

Within the PS building, the technology and utilities required for the operation of the buildings (hot oil, steam, cooling water, chilled water, compressed air, nitrogen, waste water treatment, water treatment, sprinkler centre, fire water tanks) will be located.

4.4.3.1. Hot oil system

The hot oil requirements of the anode and cathode side drying furnaces, as heat transfer media, are provided by 3 hot oil boilers installed in the boiler house. The hot oil is circulated to the process equipment by 2 to 2 circulating pumps through three backbone lines. The hot oil system is equipped with 1 hot oil tank of 50m^3 and 2 expansion tanks, with a total of about 310 m^3 of hot oil stored in the system. The tanks are inerted with nitrogen. These tanks in direct connection with all 3 boilers, two boilers supply the process system in operation, the third boiler is a cold reserve. The boilers produce ~200°C hot oil, which is delivered to the equipment by circulating pumps. The hot oil discharged will have a return temperature of ~170°C. The piping system will be designed and constructed in accordance with national and European legislation, with welded joints preferred for increased safety, and where flange joints are unavoidable, increased reliability gaskets will be used. Where joints are to be frequently loosened, the installation of a leakage protection sleeve is required. The safety systems provided minimise the risk of accidental spillage. The hot oil to the boilers is supplied by 2 to 2 pumps per boiler. The hot oil boilers are heated by direct gas-fired gas burners. Each hot oil boiler will have its own chimney for flue gas discharge to the environment, which will be housed in a common load-bearing structure on the east side of the building. The tanks will be housed in a steel containment tray made of oil-resistant material, so that there is no risk of soil contamination in the event of a disaster. The entire room will be constructed with an oil-resistant, antistatic, liquid-tight floor.

Hot oil boilers:

- 2 units 17,5 MW
- 1 unit 14 MW

The hot oil boilers were heated by gas burners. Gas burners are guaranteed to emit a maximum of 60 mg/Nm³ $_{NOx}$ per gas burner. The emission limit value per gas burner is in accordance with the requirements of the Decree 53/2017 (X. 18.) FM on the operating conditions and emission limit values for air pollutants of combustion plants with a total rated thermal input of 140 $_{kWth}$ and above but less than 50 MWth. The three hot oil boilers have their own liners, but discharge the flue gas to the environment through a common external stack. The flue gas is recovered by preheating the combustion air. The chimneys are located outside the building on the east side (P47-P48-P49).

4.4.3.2. Steam system

The saturated steam requirements of the AHU/DHU equipment are provided by 3 steam boilers installed in the boiler house, which operate on a common steam divider and are then discharged to each consumer from this steam divider. The steam boilers are designed to produce saturated steam at a pressure of 7 bar(g). No steam is used in the technology, the steam is produced exclusively for building services.

Water piped to steam boilers must be treated properly according to the boiler manufacturer's specifications. The incoming water is buffered through a mechanical filter, passed through an RO unit and then passed through a water softener before direct use. The resulting soft water is treated in the boiler feed water tank. From the boiler feed water tank, 2 to 2 boiler feed water pumps per boiler feed water tank are used to feed the boiler. The steam generated in the boiler is fed to a common steam distributor and then transferred to the point of use. The condensate produced is returned to a condensate collection tank.

The steam boilers were heated by gas burners. Gas burners are guaranteed to emit a maximum of 60 mg/Nm³ $_{NOx}$ per gas burner. The emission limit value per gas burner is in accordance with the provisions of the Decree 53/2017 (X. 18.) FM on the operating conditions and emission limit values for air pollutants of combustion plants with a total rated thermal input of 140 $_{kWth}$ and above but less than 50 $_{MWth}$. Flue gas from steam boilers is cooled in 2 stages. In the first stage it preheats the boiler feed water entering the boiler and in the second stage it is recovered by the production of waste heat for hot water before being discharged into the environment. The three steam boilers have their own liner chimneys, but share a common external load-bearing structure, and discharge the flue gas to the environment. The chimneys are located outside the building (P44-P45-P46).

Capacity of steam boilers:

- 3 units 15 t/h (10.5 MW/db)

The equipment of the steam system (feedwater tank, pump, steam distributor, condensate tank, sludge tank) will be located inside the building.

Based on the above, both oil boilers and steam boilers are connected to individual flue gas flues per boiler. The common external chimney is a support structure with its own liner pipe have flues as point sources of flue gas discharge. Accordingly, the 6 boilers are connected to 6 chimneys.

4.4.3.3. Compressed air and nitrogen supply system

The technology equipment requires compressed air with a pressure of > 0.7 MPa (7.0 bar(g)) and a dew point of -40 °C, supplied equipment installed in the compressor room. Nitrogen generators require compressed air at 0,75 MPa (7,5 bar(g)) to produce the required amount and pressure of nitrogen.

The system pressure of the compressed air system is 7.5 bar(g), with system pressure relief, where necessary, being implemented upstream of each consumption point.

The compressed air is produced by 2 oil-free screw compressors and 6 centrifugal compressors. The compressed air is then dried, recooled and filtered by an adsorption dryer. The compressed air thus prepared is connected to the compressed air network. The heat generated by the compressors is recovered in heat recovery units.

The technology equipment requires compressed nitrogen at > 0.8 MPa, 99.99% pure, supplied by nitrogen generators installed in the compressor room. The nitrogen is produced from air using pressure swing adsorption (PSA) technology. 9 nitrogen generators connected in parallel are used for this purpose. The nitrogen generators are supplied with compressed air by the compressed air network. The PSA nitrogen generator separates the nitrogen and the other gases the compressed air stream are adsorbed, leaving pure nitrogen. The generators use one 20 m^3 intermediate nitrogen buffer tank each for the process.

The nitrogen exiting the generator is passed through a filter and into 30 m^3 nitrogen buffer tanks.

The system is capable of producing 8.5 bar(g) of nitrogen using 3 booster pumps which transfer to a 5m^3 buffer tank. The backbone network and the piping of the nitrogen production equipment are made of stainless steel.

The control of the nitrogen generator and the compressors, as well as the compressed air production system, is controlled by a common control unit to optimise energy. The control is based on pressure, temperature, quantity and quality gauges installed in the system. The quality meters measure the % nitrogen purity and the dew point.

Cooling water for the nitrogen compressors and booster pumps is supplied by the central cooling water supply system.

4.4.3.4. Cooling water and chilled water

The waste heat generated by the technology is extracted using liquid chillers and chilled water produced by open water cooling towers. The open cooling towers have a continuous evaporation to the environment and therefore require a continuous supply of cooling water. Three separate cooling circuits will be implemented within the PS building as follows:

- Cooling water circuit for refrigerators (6/12°C),
- Cooling water circuit for refrigerators (12/18°C),
- Compressors and nitrogen boosters cooling water circuit.

NMP gas scrubbers (EL and NT) buildings have their own cooling system. The test equipment in the MU building also has its own separate cooling system. These cooling towers are located on the roofs of the EL and MU buildings.

Chilled water from the cooling tower is delivered to each liquid chiller by a separate circulating pump. The cooling towers are located on the roof of the PS building, while the circulating pumps are located in the compressor room and the cooling water supply room. The cooling water supply room houses the chillers that produce the chilled water and circulate it between the process users and the chiller.

The cooling water to the cooling towers is taken from the grey water network. The investor is investigating the possibility of using rainwater to provide make-up water for the cooling towers, which would further reduce the annual water consumption of the factory.

4.4.3.5. Waste water treatment

The technology mainly produces cathode and anode effluents. As cathode and anode effluents have different properties, they have to be collected separately for pre-treatment. The cathode and anode effluents have high concentrations of organic matter and nitrogen.

Cathode wastewater is also known as "A" wastewater (also called positive wastewater in some places), while wastewater from anode production ("negative" wastewater) is called "B" wastewater. The third type of wastewater ("C" wastewater) is made up of condensate and wash water containing fewer pollutants.

The detailed water flow diagram (water balance) is presented in Annex 1.14. *Note:* IQC laboratory effluents may contain a mixture of cathode and anode effluents, these effluents are treated on the cathode side effluent branch. The volumes of process wastewater to be discharged to the WWTP are given in the table below.

7. Table 1: Wastewater volumes

	Wastewater "A" (cathode)	**"B" waste water (anode)**	**"C" waste water**
Daily volume of waste water (m^3/day)	22,5	147,3	55,2
Órafactor (hours)	15	20	9
Volume of waste water (m^3/hour)	1,5	7,4	6,1

This means **a** total of **225 m^3** per day.

The wastewater to be treated comes in on three branches. Branch A is the wastewater to be treated from cathode machining, Branch B is the wastewater to be treated from the anode, and Branch C is the wastewater containing mainly condensate and wash water.

Eve Power Hungary Kft. has used its decades of experience in battery production to provide estimates of the quality of the effluents that will be generated during production. The estimated values are shown in the table below.

8. Table 3: Estimated quality of the waste water generated

Parameter	Unit of measurement	Wastewater "A" (cathode)	"B" waste water (anode)	"C" waste water
pH	-	8,4	8,1	8,2
Planned temperature	°C	15 °C		
KOI	mg/l	13 067	10 787	4 460
BOI5	mg/l	2 633	2 187	901
Ammonium Nitrogen	mg/l	0,95	12,8	6,97
Total nitrogen	mg/l	1 093	988	266
Total phosphorus	mg/l	0,1	1,1	0,4
Total suspended solids	mg/l	1 000	1 000	62
Total salt	mg/l	228	105	363
Total nickel	mg/l	0,4	0,05	0,2
Total cobalt	mg/l	0,05	-	-
Total lithium	mg/l	36,2	1,5	4,0
Total tin	mg/l	0,04	0,02	-
Total manganese	mg/l	-	-	0,05
Total iron	mg/l	-	0,04	1,02
Total boron	mg/l	6,2	0,2	1,2
Sulphate ion	mg/l	11,5	1,5	3,2
PAH	mg/l	0,00031	0,00026	0,00033

Waste water treatment technology

Balancing pool and havaria pool

The cathode (A) and anode (B) effluents are treated separately at the beginning of the process, as they contain different pollutants. The path of the C effluent will be explained later. At the intake of the incoming wastewater streams, an arch strainer is placed, which is a mechanical safety filter.

The equalisation basin, which can receive varying quantities and qualities of process wastewater, ensures the homogeneity of the wastewater sent for further treatment in terms of organic load, nutrient content and pH. Under normal circumstances, cathode effluent is fed into the cathode equalisation basin via a separate pressurised pipeline, and anode branch effluent is fed into the anode equalisation basin. A volume meter is installed on each raw sewage pipe. Both basins can hold one day's worth of wastewater, i.e. the Cathode equalisation basin has a capacity of 34 m^3 and the Anode equalisation basin has a capacity of 225 m(3). The basins are covered, made of liquid-tight, chemically resistant reinforced concrete with a double-wall coating, equipped with level switches and level gauges.

Each equalisation basin is equipped with a havaria basin to help protect the treatment technology, especially during periods the system would be subject to extremely high loads. Together with the equalisation basin, it allows for the storage of larger volumes of wastewater, which is particularly beneficial in the event of a breakdown. The volume of the havaria basins is the same as that of the associated equalisation basin (34 m^3 on the cathode branch and 225 m^3 on the anode branch). The havaria basins are covered, made of liquid-tight, chemically resistant reinforced concrete with a double-wall coating, equipped with level switches and level transmitters, and fitted with a leak detection mini-tracking system.

Depending on the specific operating conditions (equipment failure, more polluted water, etc.), the operator may decide to divert the incoming wastewater(s) from the SCADA system to the Havaria reservoir(s) using an automatic valve. From the havaria basins, water is transferred to the associated equalisation basin by means of 1+1 pumps.

The equalisation and havaria basins are equipped with a common overflow, which ensures that wastewater from one basin can flow into the other at high basin levels. The equalisation basin and the havaria basin are mixed with submersible mixers.

From here, the effluents from the two branches continue to be sent independently to physico-chemical pre-treatment. The equalised effluents are transferred to the coagulation tanks by means of a 1+1 pump with frequency converter. The pumps are controlled either by a level transmitter in the basin or by a flow meter on the pipeline.

Physico-chemical pretreatment

Chemicals can be added to precipitate the main contaminants, which are then removed in the lamella sedimentation tank. The tanks used for the coagulation, neutralisation and flocculation processes detailed below have a volume of 1 m^3 each on the cathode branch and 2,5 m^3 each on the anode branch.

Coagulation tank

The first step in the treatment process is coagulation, where incoming suspended , heavy metals and graphite are precipitated and coagulated. The tank is of PP design and equipped with a vertical shaft agitator.

The coagulant, polyaluminium chloride (PAC), is fed to the two lines from a common PAC tank. Each branch will be fed by separate 1+1 dosing pumps controlled by 4-20 mA. The PAC tank is a 3 m^3 volume double-walled tank made of PP material with level switch and level transmitter. The tank will be filled by an operator employed by the customer, equipped with the appropriate tools. The chemical storage tank is designed for a storage capacity of more than one week. The chemical consumption for cathode effluent is 10 l/day, while for anode branch effluent it is 329 l/day. The actual chemical consumption can be determined during the trial run.

Wastewater flows from the coagulation tank by gravity to the neutralisation tank.

Neutralisation tank

After coagulation, the pH of the effluent in the neutralisation tank is adjusted to 7-8. The tank is made of PP material and is equipped with a vertical shaft mixer and pH meter. 3 l/day NaOH is used on the cathode branch and 14 l/day on the anode branch. The actual chemical consumption can be determined during the trial run.

Chemical dosing is possible for both lines from a common NaOH tank, with separate 1+1 dosing pumps for each branch, with 4-20 mA control. The NaOH tank is a double-walled tank with 1 m^3 usable volume, made of PP material, equipped with level switch and level funnel.

Wastewater flows from the tank by gravity into the flocculation tank.

Flocculation tank

After neutralisation, the wastewater is fed to the flocculation tank, where anionic polyaluminium chloride is added as a flocculant. The tank is made of PP material and is equipped with a vertical shaft agitator.

The chemical is supplied by polyaluminium chloride preparation and dosing units, controlled by 4-20 mA. The anionic polyaluminium chloride is dispensed from 20 l cans.

The polyaluminium chloride solution is prepared by an automatic unit. The system includes a post-dilution panel to produce the desired 0.1% solution. A volume of 90 l/day is used on the cathode branch and 2 946 l/day on the anode branch. The actual chemical consumption can be determined during the trial run.

From here, the wastewater flows by gravity to the lamella sedimentation tank.

Lamella sedimentation

For sedimentation, lamellar sedimentation devices are used, in which the lamellas provide the necessary surface area for the sludge to settle. The settled sludge collects in the lower sludge cone of the lamella. From the sludge cone, the sludge is transferred to the sludge line by means of a pneumatic valve (anode sludge to the sludge homogenisation basin, cathode sludge to the cathode sludge tank). A volume meter is installed on the outlet pipe from the lamella settler.

The wastewater then flows by gravity into the Pretreated Wastewater Buffer Tank.

Pre-treated wastewater interceptor and MBBR equalisation basin

After the physico-chemical pretreatment, the anode and cathode effluents flow into the pretreated effluent transfer tank. The pretreated effluent clarifier has a volume of 3 $m^{(3)\ and}$ is equipped with a level transmitter and two level switches.

The pool is also equipped with a pH meter. The results provided by the meter can be used to determine whether or not the previous cleaning was successful. If not, the effluent can be pumped back to the Havaria tank located upstream of the anode branch physico-chemical treatment.

When the pH is correct, the effluent is pumped to the MBBR equalisation basin. The pumps are of 1+1 design with variable speed drive and are controlled by a level transmitter. A flow meter is also installed in the discharge branch of the pumps. The MBBR equalisation basin is a closed design, liquid tight, chemically resistant, reinforced concrete basin with a double wall coating, equipped with a leak detection minitoring system, and housing a mixer. The basin has a volume of 45 m^3 and a retention time of 0,3 days. From the MBBR equalisation basin, 1+1 pumps push the effluent into the hydrolysis basin.

Hydrolysis pool

The hydrolysis is carried out in a liquid-tight, chemically resistant, double-walled reinforced concrete basin with a mixer of 85 m^3 volume, equipped with a leak detection minitoring system. The basin is also designed to allow the addition of phosphorus (as a nutrient). The hydrolysis is designed to promote the decomposition of complex compounds. The resulting lower molecular weight organic matter is more easily accessible to the micro-organisms used in biological treatment.

Before biological purification, the following parameters can be measured in the hydrolysis basin:

- pH
- flow measurement on the delivery pump discharge

- KOI
- and total nitrogen.

Pre-anoxic pool

The pre-anoxic pool helps successful denitrification to take place if the influent effluent is rich in easily degradable carbon compounds and recirculation of the treated effluent after nitrification is ensured. The use of a pre-anoxic pool upstream of the aerobic compartments is economical when an external carbon source has to be added to the post-anoxic compartments. A mixer for homogenising the sludge will be installed in the pre-anoxic tank, will have a volume of 154 m$^{(3).}$

Wastewater flows into the basin:

- effluent from the hydrolysis basin,
- treated effluent from the outlet side of the membrane filter,
- sludge from flotation sludge
- Recirculation from the MBR oxic pool

Biological cleaning

First step

The technological spaces of the treatment line are designed according to the quantity and quality of the incoming wastewater and the desired removal efficiency. From the MBBR equalisation basin, wastewater flows by gravity to the first stage of the biological treatment plant. A special aerobic biological treatment (MBBR) is used to break down the organic pollutants in the dissolved state.

MBBR cleaning involves placing plastic carriers in the reactor. The microorganisms that degrade the pollutants in the wastewater adhere to these substrates, forming a "biofilm" (a biologically active thin layer of microorganisms). The carriers are extruded pieces of pipe with longitudinal partition walls along their inner surface. The surface area of the substrates is almost one and a half times that of plain bodies of the same size, thanks to their special design. The effluent is passed through the reactors containing the carriers. The carriers are located in 40 to 60% of the total reactor volume and are kept in motion by the air that is fed into the reactor, together with the biofilm that forms on them. A filter prevents the carriers from flowing out of the basin.

In biological thin-film biofilm systems, microorganisms multiply on fixed surfaces in the reactor. The thickness of this layer increases as the micro-organisms grow, and then the layer is partially detached from the surface and replaced by a new biological layer. As the biological layer remains in place and only the effluent to be treated flows, the biomass produced does not need to be returned to the microorganisms, as sufficient new sludge is produced on the surface of the substrates in the reactor.

Two parallel rows of artefacts are to achieve higher cleaning efficiency. A series of works will consist of 2 pools of the same volume (2 x 240 m^3), i.e. 4 pools in total. The pools will have a water depth of 4.5 m. The biological pools will be equipped with aeration systems to break down the pollutants in the effluent and to promote the necessary oxygenation. The basins contain one dissolved oxygen meter each. The system is supplied with air by blowers installed in the process building. Both the operational and stand-by blowers are frequency controlled.

The biologically treated effluent flows into two parallel arrangements of dissolved air flotation plants for phase separation and thickening of the sludge produced. Coagulant and flocculant (anionic polyaluminium chloride) are added to the effluent. The addition of coagulant promotes the formation of fine flocs in the effluent, i.e. coagulation. The flocculant facilitates the separation of the phases in the dissolved air flotator and helps to thicken the settled sludge phase.

Coagulant dosing is possible with 1+1 dosing pump and will be operated with 4-20 mA.

The exact amount of polyaluminium chloride added depends on the quality and contamination of the water to be treated, i.e. the dosage is adjusted on the basis of measurements. The polyaluminium chloride solution is supplied by the polyaluminium chloride preparation and dosing units, controlled by 4-20 mA. Anionic polyaluminium chloride is dispensed from 20 l cans. A post-dilution panel is part of the polyaluminium chloride solution preparation system to produce the desired 0,1 % solution. Daily use: minimum 2,3 m^3/day.

During flotation, a special pump mixes microbubbling air into the wastewater and injects it into the system, causing some of the sludge to float to the surface (light sludge) and the heavy sludge to settle by gravity to the bottom of the unit. The floated sludge is fed by a scraper into the flotation sludge hopper. The heavy sludge collects at the bottom of the unit and is regularly removed through a chute. The removed heavy and light sludge is pumped to the sludge homogenisation basin by a dry pump.

The flotated effluent is discharged into a 2 m^3 DAF transfer tank. From there, the water is released into the anoxic space of the MBR by means of 1+1 pumps. As a result of the purification processes carried out so far, the amount of easily degradable carbon source in the wastewater for denitrification in the anoxic compartment is significantly reduced. For this reason, a carbon source feeding facility will be developed in the DAF transfer station. Coal source feeding from the coal source tank is possible by means of a dosing pump, if necessary controlled by a 4-20 mA signal. The coal source tank is a 1 m^3 volume, PP material and double wall tank. If required, nutrient (phosphorus) feeding is also provided from a nutrient feeding tank, controlled by a pump with 4-20 mA. The phosphorus tank is a 1 m^3 volume, PP material, double-walled tank.

Second step

In the second stage of biological treatment, not only wastewater A and B is treated, but also wastewater C. The second stage consists of an MBR divided into two basins.

The first part of the basin rows is an anoxic basin (165 m^3) and the second is an oxic basin (370 m^3/row). The depth of the basins is 4.5 m. The MBR technology is a continuous operation system combining sludge basins and membrane filtration to maintain high sludge concentrations. The membrane retains the sludge in the system, not only the efficiency of organic matter removal, but also eliminating the need for a final sedimentation system. The resulting sludge is fed to the sludge thickener by means of a 1+1 pump.

In the oxic space, ammonia dissolved in the wastewater is oxidised to nitrite and then nitrate (nitrification), in addition to the decomposition of organic matter. In the anoxic zone, nitrite and nitrate are oxidized by bacteria into elemental nitrogen (denitrification). The nitrate recirculation loop, which moves the effluent from the oxic to the anoxic compartment, ensures that sufficient nitrate is available in the anoxic compartment.

The oxic pool will be equipped with a dissolved oxygen meter, nitrate meter, level switch and level transmitter. The air supply will be provided by blowers installed in the process building and equipped with a frequency converter. Two blowers will operate simultaneously. The spare blower is identical to the spare blower used for the MBBR pool (common spare).

Ultrafiltration

The removal of purified water from the oxic basin space is achieved by 1+1 dry room pumps 4-20 mA control. The pumps are used to send the effluent to the UF membrane system (ultra filtration). The CIP system is connected to the upstream part of the UF membrane system to ensure the proper operation of the membranes by periodic cleaning.

UF is a membrane filtration process that uses hydrostatic pressure to force water through a semipermeable membrane. It physically separates solids from liquid streams based on the principle of size exclusion. The concentrate (sludge), filtered by the system, is partly recirculated and partly discharged into the sludge thickener by means of a pump.

Membrane recirculation tank

From the UF membrane system, the permeate is gravity drained to the Membrane Recirculation Tank. The tank is a 50 m^3 PP material tank equipped with two level switches and a level transmitter. The volume of water leaving the tank and its NTU (turbidity) value are also measured. From here, the path of the purified water is bifurcated. The treated effluent is steered by means of automatic valves. From here, part of the treated effluent flows into the sewer, now complying with the limits for water that can be discharged into the sewer. The recirculated water flows by gravity into the AOP equalisation tank

Permeate water purification

The AOP equalisation tank is a 30 m^3 tank equipped with two level switches and a level transmitter. From here, the purified water is fed by 1+1 dry pumps with 4-20 mA control to a special activated carbon purification unit regenerated on site by electrochemical oxidation.

The AOP process involves electrochemical oxidation and adsorption technology. Adsorption is achieved by a special adsorbent medium which can be regenerated in-situ in the reactor. The process therefore does not require chemical dosing.

The technology used combines adsorption and electrochemical oxidation in one unit. As the water to be purified flows into the reactor vessel, the impurities are concentrated on the surface of the adsorbent medium, which is non-porous and has a high electrical conductivity.

At the same time, a low electric current is passed through the carrier bed so that the adsorbed impurities are completely mineralised as H_2O, H_2 and CO_2 without sludge formation. Unlike conventional activated carbon filters, the special substrate is efficiently regenerated on site and the process can be continued without interruption.

Water is then gravity fed into the 20 m^3 RO equalisation basin. From there, it is pumped by 1+1 dry pumps to a 6 m^3/hour reverse osmosis membrane system. The RO membrane ensures that contaminant concentrations are reduced to below the internal limits. The long-term operation of the RO is ensured by the fact that the pollutants that inhibit its efficiency have already been removed in the previous steps.

The purified water then flows into a 120 m^3 purified wastewater basin equipped with two level switches and a level collector, where it is possible to decide whether the purified water is discharged into the sewer or recycled back into the plant.

The monitoring of the quality of the effluent in the treated water tank is planned by installing the following instruments:

- pH meter,
- conductivity meter,
- KOI analyser,
- NH4-N meter.

Purified waste water quality control basin

The treated effluent from the AOP treatment overflow flows by gravity into the quality control basin. The basin is equipped with various meters that monitor the quality of the treated effluent, such as:

- total phosphorus concentration
- Ammonia, ammonium nitrogen concentration
- KOI concentration
- Temperature
- total suspended solids concentration
- pH

If individual concentrations are above the threshold, the effluent can be returned to the treatment line.

Treatment of other waste water (C)

Under normal circumstances, the wastewater from branch C is sent to the equalisation basin through a separate pressurised pipe, after mechanical treatment (arc screen). The basin has a volume of 75 m^3, is made of reinforced concrete, is liquid-tight, chemically resistant, equipped with a leak detection monitoring system, double-walled, with two level switches and a level gauge.

The equalised effluent is pumped to the MBR anoxic basin by a 1+1 pump with frequency converter. The pumps are controlled by a level transmitter installed in the basin.

From here, the treatment process for the branch C effluents is the same as for the cathode and anode effluents, as already detailed.

Mudline

The cathode sludge tank collects the cathode sludge produced during physico-chemical treatment. The Anode sludge and DAF sludge are discharged directly into the sludge homogenisation tank. The Sludge thickener thickens the UF membrane concentrate, the excess sludge from the MBRs.

The sludge settled in the thickener is designed to have a dry solids content of 2-3 %. The leachate flows by gravity to the leachate interceptor. The thickeners are equipped with level switches.

The compressed sludge is removed by 1+1 variable speed screw pumps, which remove the sludge from the thickener sludge and transfer it from there. In the case of cathode sludge, the compressed sludge is transferred to the sludge dewatering equipment (cathode filter press). In order to achieve a higher dry solids content, polyaluminium chloride is added to the feed cathode sludge by means of a polyaluminium chloride dissolving and dosing system. The dewatered sludge from the cathode filter press is collected in a 4 m^3 container and transported. It must be treated as hazardous waste due to the high concentration of heavy metals.

The anode and DAF sludge and the sludge concentrated in the Sludge thickener are fed into a common Isaphomogenisation Basin. The Isaphomogenisation Basin is a 77 m^3 volume reinforced concrete double-walled, liquid tight, chemically resistant, double-walled coated basin with level switches, level feeders and vertical axis mixers, equipped with a leak detection monitoring system. The sludge is delivered to the filter press by a pump with 1+1 frequency variator. Prior to dispensing, polyaluminium chloride is added to the sludge in the same way as for cathode sludge. The dewatered sludge is collected in a 4 m^3 container and transported from there. The amount of sludge depends largely on the quality of the water and the amount of chemicals used.

The leachate tank is equipped with level switches and a level transmitter with a volume of 5 m^3.
is delivered to the C grid by a 1+1 dry pump with control.

The wastewater pre-treatment plant does not emit any odours during normal operation, but in case of malfunction, odorous substances may be generated from improper decomposition processes. In order to maintain good air quality at all times, an activated carbon filter is used to treat the air extracted from the air in the basins.

Within the PS building, an HDPE film system with a leak detection manhole will be installed under the wastewater treatment section of the building.

In the event of a failure of the specific components of the treatment plant, the need for the transport of waste water as waste is not expected, as follows:

- A final inspection is planned at the discharge endpoint of the treatment plant, and if the treated effluent is not of satisfactory quality, it will be returned to the previous point in the treatment system.
- The biochemical purification systems (MBR and MBBR) were designed in parallel according to the needs of the Permittee. Therefore, if maintenance of a line is required or in case of a possible failure, the effluent can be treated in the parallel treatment line.
- In the event of a failure of the treatment plant, where the above redundancy cannot be applied, the wastewater is stored in a havaria tank and the equalisation tank can be used to retain untreated wastewater if required. The combined capacity of the tanks~ is capable of retaining 3 days' worth of wastewater (~683 m^3 capacity)
- Based on a statement by the permit applicant, if the failure of the wastewater treatment plant cannot be repaired within 48 hours, the process parts that discharge wastewater will be shut down. In this case, the restart of the process is only planned once the untreated waste water stored in the above tanks has been treated at the treatment plant.

A schematic diagram of the operation of the treatment plant is given in chapter 1.26.

4.4.3.6. Waste water after-treatment

The treated effluent from the on-site wastewater treatment plant and the RO concentrate from the RO equipment are combined in a 300 m^3 mixing basin. The mixing basin is double-walled reinforced concrete basin with a leak detection system and a chemically resistant continuous coating. This basin will be used for post-testing of the quality of effluent and, if necessary, for pH adjustment.

4.4.3.7. Technological water preparation

Water preparation for the steam system

The water supplied to the steam boilers is mixed water provided by the service provider and must be properly treated before being supplied to the steam boilers. The mixed water arriving in the right quality first filtered through an automatic backwash filter and then purified through an RO unit. After filtration and also within the RO unit, chemicals are added to the water. The chemicals used are:

- Cillit OptiDOS B207 organic ascorbic acid based oxygen scavenger, dispersant, volatile alkaliser or equivalent compound (Alkaliser)
- Cillit OptiDOS B277 phosphate-based corrosion inhibitor and feed water alkaliser or equivalent compound (Corrosion inhibitor)

Water preparation for the technology

The water required for the technology is also produced from mixed water supplied by the service provider, which is first filtered through an automatic backwash filter. To bind the free chlorine, chemicals are added to the system and the water is then purified through a two-stage RO system. Electrical deionisation equipment (EDI) is used after reverse osmosis to deionise the desalinated water to achieve low conductivity and low silica content. As a final step, the water is passed to a mixing bed for fine purification to achieve the strict parameters required for process water.

The chemicals used:

- Cillit OptiDOS C830 cooling tower inhibitor (against scale, flotation and corrosion) or equivalent compound (corrosion inhibitor)
- Cillit OptiDOS B277 phosphate based corrosion inhibitor and feed water alkaliser or equivalent (Alkaliser)
- Cillit OptiDOS CLO biocide or equivalent (Fungicidal agent)

Water preparation for cooling towers

The cooling water arriving at the cooling towers is bought from a grey water network treated before use. The incoming greywater is first filtered through a parallel connected automatic backwash and then purified through an RO unit. After filtration, chemicals are added to the system to bind the free chlorine, and chemicals are also added to the water within the RO unit. An additional descaler is added to the make-up water upstream of the cooling tower, and biocide is added on the outlet side of the cooling tower.

The chemicals used:

- Cillit OptiDOS C830 Cooling tower inhibitor (against scale, flotation and corrosion) or equivalent compound (corrosion inhibitor)
- Cillit OptiDOS CLO biocide or equivalent (Fungicidal agent)

The chemicals needed for water preparation are stored on a storage tank next to the place of use, and are fed in a closed system with pumps, so there are no emissions from the use of chemicals.

4.4.3.8. Sprinkler system

Water for the automatic extinguishing system and the hydrant network of the plant will be supplied from the engine room on the ground floor of the PS building. The planned design complies with the Hungarian standard for increased operational safety as well as the VdS "Type 4" design. The machine room will house two full-size pumps, one electric and one dieselfor the sprinkler system and two full-size pumps, one electric and one diesel, for the fire water network. Each of these 4 pumps can independently provide the required water volume and pressure to the system.

We expect to provide the necessary water for both the external and internal hydrant network. The sprinkler pumps should be able to provide a flow rate of approximately 7600 l/min, while the firewater pumps should be able to provide a flow rate of approximately 6300 l/min.

The engine room will be equipped with 2 concrete tanks for the sprinkler system, which will store water for the entire operating time. Each of these will have a useful volume of at least 510 m^3 (in addition to the theoretical water volume required, to provide additional water for any watering down that may be required). In addition, a min. 15 m^3 of water will also be provided. For the fire water network, a min. 570 m^3 of concrete tank with a useful volume of at least 570 $m^{(3).}$ All tanks, including the pressure tank, shall be equipped with automatic refilling. Water for filling the tanks shall be provided from the industrial dilution water network.

The machinery space shall be fire-insulated from the rest of the building.

The engine room will be directly accessible from the outside and will kept out of the way of unauthorised persons. The engine room shall provide the necessary ventilation for the diesel pumps. Flue gas discharges from diesel pumps are reportable point sources (P53-P54)

A minimum temperature of 10°C must be maintained in the engine room at all times. The engine room shall also house the alarm valves for the protection of the Supply Station building. From the engine room, water shall be supplied to the sub-centres of all buildings via an earth conduit in the form of a circuit.

4.4.3.9. Havaria treatment

There are no environmental risks associated with the compressed air, nitrogen production and steam systems in the PS building.

The water treatment system uses chemicals that pose an environmental risk if spilled, so the chemical dosages and stored chemicals used for water treatment should always be included in the chemical dosages and stored chemicals is placed on a salvage tray made of a material resistant to the material. Chemical dosing is carried out through a closed system.

In the case of the hot oil system, a private steel buffer is placed under the storage tanks. The room will have a liquid-tight, chemically resistant (oil resistant) floor covering. A floor corridor will be installed in front of the room's doors and around the boilers.

The chillers in the building are filled with cooling tower water, which has the advantage over glycol, which poses an environmental risk, so that there is no adverse environmental impact in the event of a disaster in the building. The chillers use an environmentally friendly low pressure refrigerant (GWP<1).

The building also houses the sewage treatment plant. The wastewater treatment room will have a continuous, liquid-tight, chemical-resistant floor covering, and HDPE film connected to a leakage system will be installed under the wastewater treatment room. The concrete basins will be provided with a continuous, liquid-tight, chemically resistant coating, the tanks will be made of chemically resistant material. A seal will be installed in front of the room's doors to prevent spillage into adjacent rooms.

When used in small quantities (a few decilitres) for cleaning and maintenance purposes, any spillage can be quickly and effectively wiped up. In all places where any kind of cleaning or maintenance fluid is used, a spill emergency spill kit (, rags, etc.) appropriate to the chemical is placed. Only bottles in use may be kept in damage control trays in the area of use. Unopened bottles will be stored in cabinets with their own damage control trays.

The rooms will be fitted with liquid-tight, chemically resistant floor coverings, with a damp-proof drain in front of the doors. There will be no floor drains connected to a public sewer in the process rooms. On the external façade of the building, automatic fire thresholds will be installed on the leading to the outside behind which the use of foam-extinguished hazardous materials takes place, and which are not stored in a fire exit. This will prevent the escape of hazardous substances and extinguishing agents into the environment.

The condensate and leachate from the compressed air system, the steam boiler system, the cooling system are transferred to the on-site wastewater treatment plant as type C wastewater.

4.4.4. RM building

The building is used for the storage of raw materials and the testing of incoming raw materials, for which various testing facilities are installed.

4.4.4.1. Raw material storage

Raw materials are delivered to the site by lorry. The raw materials for production are delivered via 3 industrial dock doors, using a pallet system. After sorting on the ground floor, the raw materials are stored in the 9-position automatic high-bay warehouse. In the warehouse, the various raw materials used in battery production are stored passively on racks. There will be no open unit packs on the premises, the raw materials to be tested will not be tested by opening the unit pack but from samples sent by the supplier.

4.4.4.2. Raw material tests

Raw materials must meet testing requirements before lithium-based batteries can be manufactured. These tests demonstrate that the battery production and the finished product are safe and do not pose a safety risk during transport by air, water, rail or road. These tests take place in the RM building. The building will contain sample storage rooms and test rooms for the following tests on raw materials:

- dimensional control of raw materials
- spectrometric analysis
- microscopic examinations
- chemistry analysis
- physical analysis (water content, particle size, etc.)

The equipment is supplied with cooling water from a cooling tower on the roof of the building. Contaminated air from the equipment is routed to an activated carbon separator on the roof of the building and after treatment is discharged to the environment (P43). Waste water from the laboratories is treated in a closed pipe to the waste water treatment plant in the PS building.

A UPS will be installed in the building, with 16 leadbatteries connected to the uninterruptible power supply.

4.4.4.3. Havaria treatment

In the RM building, large quantities of PAA and CMC are stored in the storage area as liquid bulk material. In all cases, storage is passive in factory packaging in accordance with ADR requirements. Passive storage minimises the risk of an accident occurring, but the storage area is designed to ensure that in the event of an accident, rapid intervention can be ensured and that no environmental damage can result from an accident. Liquids are stored separately from solids and dust. The storage area for liquids shall be designed in accordance with the OCR and the standards applicable to flammable liquids. The storage area shall be designed for damage control in accordance with MSZ 15633-2. A liquid detector will be installed in the containment area to provide an audible and visual alarm in the event of a spill. The signals from the liquid sensors will be integrated into the BMS system and will provide an immediate alarm in the event of a leakage, allowing for immediate intervention. The hazardous material storage areas will be equipped with ppm gas and/or solvent vapour sensors connected to the BMS system, which will be installed for occupational safety purposes, in addition to the occupational safety requirements, as in the event of a leakage, these sensors will also provide an immediate alarm due to evaporation. The damper will be provided with a continuous, liquid-tight and chemically resistant (epoxy) enclosure. The coating has a minimum resistance to stored chemicals of 24 hours. The primary consideration in the design of the containment structure is to provide a suitable containment surface for the epoxy coating to be applied, and accordingly its crack width is a key design parameter, which is always specified on the basis of the crack resistance of the coating. An emergency decontamination kit will be provided in the storage areas.

The raw materials quality control rooms contain small quantities of chemicals, but they are protected by an emergency spillage decontamination kit (, rags etc.) can be managed. Only used bottles may be kept in the use area in a damage control tray. Unopened bottles will be stored in cabinets with their own damage trays. Apart from this, the rooms will be constructed with liquid-tight, chemical-resistant flooring. The primary consideration in the design of the floor covering receptor structure is to provide a suitable receptor surface the floor covering to be used, and accordingly its crack width is a key design parameter, which is always specified on the basis of the crack resistance of the coating. The installation of HDPE under the building is not justified.

Floor drains connected to public sewers are not installed in the process rooms. Automatic fire thresholds will be installed on the external facade of the building for doors leading to the outside behind which the use of foam-extinguished hazardous materials - which are not stored in a fire exit - takes place. This will prevent the escape of hazardous substances and extinguishing agents into the environment. Wastewater from the laboratories is connected to the on-site wastewater treatment plant.

4.4.5. SO building

The building houses the sorting and packaging of semi-finished products and the rack storage of semi-finished and finished products. At the end of the production process, the batteries are sorted, packaged and coded to ensure the conformity of the finished product delivered. Equipment for open circuit voltage measurement of semi-finished products and foreign object detection is located in this building. After the tests have been carried out and the products have been packaged, the finished products are stored in a racking system inside the building.

The exhaust system of the tracers is released to the environment after decoupling (P36).

4.4.5.1. Havaria treatment

The SO building does not contain large quantities of liquid substances. Semi-finished and finished batteries stored in the SO building are sealed, so no spills are expected. Liquid sensors are installed in the storage area as an additional protection element. Signals from the liquid sensors will be incorporated into the BMS system, which will provide an immediate indication in the event of a leakage, so that immediate intervention can be taken. In the storage areas, ppm gas and/or solvent vapour sensors connected to the BMS system will be installed as a cover, which will not only meet the safety requirements but also provide an immediate alarm in the event of a leakage due to evaporation. An emergency decontamination kit will be installed in the storage rooms.

When used in small quantities (a few decilitres) for cleaning and maintenance purposes, any spillage can be quickly and effectively wiped up. In all places where any kind of cleaning or maintenance fluid is used, a spill emergency spill kit (, rags, etc.) appropriate to the chemical is placed. Only bottles in use may be kept in a damage control tray in the area of use. Unopened cylinders will be stored in cabinets with their own damage control trays.

The rooms are fitted with liquid-tight, chemically resistant flooring, with a damp-proof drain in front of the doors. The primary consideration in the design of the floor covering receptor structure is to provide a suitable receptor surface the floor covering to be used, and accordingly to crack width is a key design parameter, which is always specified on the basis of the crack resistance of the coating. Floor drains connected to a public sewer shall not be installed in the process rooms. On the external facade of the building, automatic fire thresholds will be installed on the exterior doors leading to the outside to prevent the escape of extinguishing agents into the environment. Taking into account the materials stored and the protection systems to be installed, there is no justification for the installation of HDPE under building.

4.4.6. MU building

The building has several functions, such as office, kitchen, canteen, meeting rooms, fire brigade, but from a technological point of view, the most important is the test equipment located on the 2nd floor of the building.

Test rooms will be set up to carry out the following tests:

- purity control
- cycle testing

A UPS will be installed in the building, with 16 leadbatteries connected to the uninterruptible power supply.

There are no emissions from the installations and therefore no emission point sources associated with the technologies.

The emission point source from the kitchen is P51.

The building is also home to the facility's fire station. Exhaust gases from the fume cupboards can be vented gravity. The on-site fire station is not an emission point source.

The protective clothing used by establishment firefighters does not require any special cleaning during normal use (drills, maintenance of machinery, etc.). In this case, cleaning is carried out in washing and drying machines located at the fire station and no hazardous substances are discharged into the municipal waste water.

The same applies to the vehicles and intervention equipment used by firefighters, which do not generate hazardous waste during maintenance and cleaning. Oil changes and repairs of vehicles will be carried out by an external service.

If a fire or accident occurs where firefighters' protective clothing, personal protective equipment (e.g. breathing apparatus) and fire hoses are contaminated with hazardous substances, they must be decontaminated with water at the scene of the accident, collected and disposed of as hazardous waste. The equipment is then transported in secure packaging to a licensed specialist company for final disposal. Vehicles are also decontaminated at the scene of the fire or accident by collecting the contaminated water and disposing of it as hazardous waste.

Wastewater from the social rooms used by the firefighters (toilets, showers, etc.) is discharged into the municipal wastewater network.

The reserve fuel (approx. 300 litres of gas oil) and approx. 400 litres of foam agent required for the safe operation of the fire-fighting vehicles will be stored in IBC tanks with 1 IBC with damage protection.

4.4.6.1. Havaria treatment

The MU building does not contain large quantities of liquid substances. There are small quantities of chemicals in the battery testing rooms, but they can be handled with emergency spill kits (softeners, rags, etc.) located in the room. In the use area, only bottles in use may be kept in a damage control tray. Unopened bottles will be stored in cabinets with their own damage control trays.

In places where hazardous vaporising substances are used, ppm gas and/or solvent vapour detectors connected to the BMS system are installed as a cover, which in addition to the safety requirements also serve environmental safety, as in the event of a leakage, these detectors also trigger an immediate alarm due to the vaporisation.

Regardless of this, the rooms will be fitted with liquid-tight, chemically resistant floor coverings. The primary consideration in the design of the floor covering receptor structure is to provide a suitable receptor surface for the floor covering to be applied, and accordingly its crack width is a key design parameter, which is always specified on the basis of the crack resistance of the coating. On the external façade of the building, automatic fire thresholds will be installed on the exterior doors leading to the outside to prevent the escape of extinguishing agents into the environment. Taking into account the materials stored and the protection systems to be installed, there is no justification for the installation of HDPE under the building.

Floor drains connected to public sewers are not installed in the process rooms.

4.4.7. DW building

The building is used as a hazardous waste collection point for the plant and as a storage facility for hazardous raw materials. Ventilation of the entire premises (both normal and emergency) is connected to an active carbon tower (P42), and HDPE foil is installed under the entire building, tied to a monitoring manhole. The DW building will be equipped with a waste collection and storage area covered by Annex 2, point 1 of Government Decree 439/2012 (XII. 29.) on the rules for the construction and operation of certain waste management facilities, which will be fully compliant with the legal requirements of the floor structure layer system for the entire building. In rooms containing flammable and explosive liquids, a latched explosion-proof solvent vapour detector will be installed for the emergency ventilation system. The storage area for liquids will be designed in accordance with the OTSZ and the standards applicable to flammable liquids. The storage area will be designed for damage control in accordance with MSZ 15633-2. A liquid detector will be installed in the containment area to provide an audible and visual alarm in the event of a spill. The liquid sensor signals will be integrated into the BMS system and will provide an immediate alarm in the event of a leak, allowing immediate intervention.

4.4.7.1. Havaria treatment

The building will be used for the storage of various types of hazardous materials, and the floor will have a continuous, liquid-tight, chemical-resistant coating. The primary consideration in the design of the containment structure is to provide an adequate containment surface for the coating to be applied, and accordingly its crack width is a key design parameter, which is always specified on the basis of the crack resistance of the coating.

The installation of HDPE film tied into a monitoring well under the building is justified. Accordingly, the entire building will be covered by a layer system that fully meets the requirements of Government Decree 439/2012 (XII. 29.).

Floor drains connected to a public sewer are not installed in the process rooms. Automatic liquid containment barriers or a raised ramp with a ramp will be installed at the openings of rooms in the building where foam-extinguished hazardous material is used or stored. This will prevent the release of hazardous substances and extinguishing agents into the environment.

4.4.8. BD Building

Waste batteries generated during production and testing are discharged, but some of these waste batteries cannot be discharged and their disposal or storage poses a safety risk. These charged discarded batteries will be dismantled in the BS building. After dismantling, the anode foils, which pose a safety risk, will be vacuum packed and transferred to the BD building. In the BD building, the anode foils are placed in a chemical exothermic incinerator (maximum 5 kg at a time, maximum 120 kg per day). The anode foil spontaneously ignites when exposed to water. Therefore, water is sprayed into the incinerator after the foils are inserted, causing the anode foil to ignite. The burning process takes about 15 minutes. After the combustion process is completed and the equipment has cooled down, the combustion slag is removed manually from the burner.

The combustion process produces flue gas at a temperature of about 700-1000 °C at a rate of about 3000 m^3/h. The flue gas undergoes the following treatment processes before being released to the environment:

1. Washing with a Venturi washer
2. Condensation
3. Dust collection
4. Redundant active carbon screening

Wastewater from the Venturi scrubber and the condenser will be collected in a septic tank adjacent to the building, from where it will be transferred to the wastewater treatment plant. As a result of the flue gas treatment, a polluted air stream below ambient limits will be discharged to the environment at the point of emission (P39). The entire room ventilation (both normal and emergency) will be directed to this point source.

In the BD building, a chained area will be designated for the explosion-proof cabinet for the storage of anode foils from the BD building and for the storage of post-treatment waste. This segregated area is considered as a waste collection and storage site under Annex 2, point 1 of Government Decree 439/2012 (XII. 29.) on the rules for the construction and operation of certain waste management facilities. Accordingly, the entire building will be covered by a layer system that fully meets the requirements of Government Regulation 439/2012 (XII. 29.).

A latched solvent vapour detection system will be installed for the emergency ventilation system in the

building. The entire floor of the BD building is chemical, conductive, non-sparking and liquid-tight.

4.4.8.1. Havaria treatment

The building will be used for anode foil disposal, which will require the application of a minimum amount of water, and the floor will be covered with a conductive, non-sparking, continuous, liquid-tight, chemically resistant coating. The primary consideration in the design of the receptor structure is to provide an adequate receptor surface the coating to be applied, and accordingly its crack width is a key design parameter, which is always specified on the basis of the crack resistance of the coating. The installation of an HDPE film tied into a monitoring well under the building is justified and fully complies with the requirements of Government Decree 439/2012 (XII. 29.).

Floor drains connected to a public sewer are not installed in the process rooms. Automatic liquid containment barriers or a raised ramp with a ramp will be installed at the openings of rooms in the building where foam-extinguished hazardous material is used or stored. This will prevent the release of hazardous substances and extinguishing agents into the environment.

4.4.9. BS building

The building is used for testing batteries, with various test equipment being installed. In addition to the tests, the dismantling of batteries that cannot be drained is also carried out in this building. Within the building there is a sample storage room and rooms for the welding processes required for each test and for the preparation of the batteries for testing.

Test rooms will be set up to carry out the following tests:

- seawater testing
- ARC testing
- triple test
- mechanical damage test
- electrical test
- filling and submerging
- thermal testing
- environmental adaptation study

The dismantling process for spent batteries

Non-submersible waste batteries are transported to a dedicated room in the BS building for dismantling. The dismantling operation consists of cutting the batteries and dismantling their components (anode, cathode, separator). After dismantling, the anode foils, which pose a safety risk, are vacuum packed and transported to the BD building.

Cutting of batteries should be carried out with a non-sparking (e.g. ceramic) knife, with constant suction. Other components of the battery (separator foil, cathode foil, etc.) must be collected separately in a sealed container and transported to the DW plant collection point at least every shift.

Battery disassembly a major safety risk, as a charged battery is prone to spontaneous combustion. A strict low humidity level must be maintained in the room. Disassembly of the battery should only be carried out by local exhaust ventilation can be carried out in compliance with the relevant health and safety regulations. Open cells must be stored under continuous fume extraction. Separate waste storage rooms shall be provided in the building for tested batteries, batteries awaiting dismantling and dismantled battery components. These storage facilities shall be considered as waste collection and storage facilities covered by Annex 2, point 1 of Government Decree 439/2012 (XII. 29.) on rules for the construction and operation of certain waste management facilities. Accordingly, under these parts of the buildings, a stratification system is established which fully meets the requirements of Government Decree 439/2012 (XII. 29.).

In rooms containing hazardous liquid technologies, interlocked solvent vapour detection systems will be installed for emergency ventilation.

In the rooms where flammable and explosive liquids are stored/used, interlocked explosion protection solvent vapour detection systems will be installed.

Emissions from test facilities, local extraction and dismantling room and waste storage ventilation (normal and emergency) are discharged to the environment after activated carbon capture (P40-P41).

4.4.9.1. Havaria treatment

The BS building does not contain large quantities of liquid substances. There are small quantities of chemicals in the battery testing rooms, but these can be handled with a spill emergency decontamination kit (softeners, rags, etc.) located in the room. Regardless of this, the rooms will be fitted with liquid-tight, chemical-resistant floor coverings.

. The primary consideration in the design of the host structure is to provide a suitable host surface the coating to be applied, and accordingly its crack width is a key design parameter, is always specified on the basis of the crack resistance of the coating. In all areas where any kind of cleaning or maintenance fluid is used, a spillage emergency spillage kit (watering up materials, rags, etc.) appropriate to the chemical to be used will be provided. Only bottles in use may be kept in a damage control tray in the area of use. Unopened cylinders will be stored in cabinets with their own damage control trays.

The building will be used for temporary storage of batteries that have already been tested, batteries awaiting dismantling, and for temporary storage of dismantled components after dismantling, and will serve as a waste storage area. These rooms form a group of rooms together with the dismantling room. Under this group of rooms, HDPE film is placed, i.e. a system of HDPE film with a leakage control manhole is placed under the waste storage rooms and also under the dismantling room. The layering system under this group of rooms will fully comply with the requirements of Government Regulation 439/2012 (29.12.2012) in the battery dismantling room and the liquid electrolyte container in the designated storage room will be stored on a damage saver.

Floor drains connected to a public sewer are not installed in the process rooms.

Automatic liquid containment barriers or a raised ramp with a ramp will be installed at the openings of rooms in the building where foam-extinguished hazardous substances are used or stored. This will prevent the release of hazardous substances and extinguishing agents into the environment.

Wastewater from the laboratories is connected to the on-site wastewater treatment plant.

4.5. Water supply

4.5.1. Water supply existing status

In the surroundings of the planning area, under the road 0237/395, there is an existing drinking water pipeline D225KPE, operated by the Debreceni Waterworks. This pipeline will be used by the Municipality of Debrecen (DMJV) to provide the final drinking water supply to the site from road 0237/400, passing through plot 0237/398.

4.5.2. Water supply planned status

The water balance used as a data source includes water requirements for drinking water and process water:

- drinking water demand: 4 m^3/h or 79 m^3/day
- industrial dilution water demand: 53.3 m^3/h or 585.11 m^3/day
- industrial grey water demand: 160 m^3/h, 2981,78 m^3/day

The drinking water needs of the plant can be served by the existing backbone, no network upgrades are required.

In order to supply the technological water needs of the plant, an industrial grey water and industrial dilution water network will be built by the City of Debrecen (DMJV) at separate connection points.

Based on the planning layout and the above data, three separate and independent internal water supply networks are planned to provide municipal and process water: drinking water, industrial dilution water and industrial grey water. In addition, an internal water supply network for heating and sprinkler systems and a sprinkler network will be installed separately within the site. The drinking water network will be used exclusively for municipal purposes. The industrial grey water will the water needs of the cooling towers, while all other process water needs, fire-fighting water needs and sprinkler water needs will be met by the industrial dilution water network.

4.5.2.1. Drinking water network

Access point: from the road 0237/400, on the eastern side of the site.

Internal network: a potable water circulation network bypassing the proposed buildings within the plot, according to the building engineer's outfall data, and used for municipal purposes only.

Metering point design: inside the plot, 1 m from the fence, metering well installation and instrumentation according to specifications, designed according to service provider needs.

Water connection point of service: water meter clock.

4.5.2.2. Industrial dilution water network

Access point: from the road 0237/406, on the west side of the site

Internal network: for further pre-treatment for use in the process, the water is discharged to the PS building; after pre-treatment, an internal network of pipes transports the process water to the consumption points. Filling of the extinguishing water tanks of the plant is provided by the industrial dilution water network and the sprinkler network of the site is also supplied by the industrial dilution water network.

A separate fire water and sprinkler network will be installed within the planning area to provide for external and internal fire water requirements. Based on fire protection data

- water demand of the fire water network (6300 l/min):
    - external extinguishing water demand 6000 l/min
    - internal extinguishing water demand 300 l/min
- sprinkler system water demand 8000 l/min extinguishing water demand.

The demand for extinguishing water is supplied from the extinguishing water storage tanks located within the PS building, using booster pumps, and the industrial dilution water network is only required for filling and maintenance purposes.

Metering point design: inside the plot, 1 m from the fence, metering well installation and instrumentation according to specifications, designed according to service provider needs

Water connection point of service: water meter clock.

4.5.2.3. Industrial greywater network

Access point: from the road 0237/406, on the west side of the site.

Internal network: for further pre-treatment for use in the technology, the treated greywater is discharged to the PS and MU buildings; after pre-treatment, an internal network of pipes transports the treated greywater to the consumption points, which is used exclusively in the cooling towers.

Metering point design: inside the plot, 1 m from the fence, metering well installation and instrumentation according to specifications, designed according to service provider needs.

Water connection point of service: water meter clock.

4.6. Sewerage

4.6.1. Sewerage existing status

A D200 PVC-U gravity sanitary sewer is located under both road 0237/406 and road 0237/400. Both municipal sewers are operated by Debreceni Vízmű Zrt. The urban waste water from the planning area is discharged into the urban waste water sewer under the road 0237/406. No connection to the existing municipal sewer under the road 0237/400 will be made during the project.

Based on the statement of principle of the Mayor's Office of the City of Debrecen, City Management Department, the drainage is constructed on the southern border of the planning area, the parcel 0237/395, within the framework of another project, the final recipient of the stormwater is the Látóképi reservoir marked L- 1. Two connection points to this drainage ditch will be constructed on the southern side of the development site to discharge stormwater runoff from the development site. Based on the Reception Statement, there is another stormwater inlet point on the west side of the site, at 0237/406, but no stormwater connections are planned to this inlet point from the site.

4.6.2. Sewerage planned status

The water balance to be used as a data source includes, for urban and process industrial waste water
the relevant quantities:

- urban waste water: 3 m^3/h or 68.14m^3/day
- industrial process wastewater: 73.4 m^3/h or 1336.87 m^3/day.

The municipal wastewater needs of the plant can be served by the existing backbone, no network upgrades are required.

A new sewerage network will be built by the City of Debrecen (DMJV) to supply the industrial process wastewater generated at the site.

Based on the above, two separate and independent internal wastewater networks are planned for the discharge of municipal and process industrial wastewater. The municipal wastewater network will be used exclusively for the discharge of wastewater of a municipal nature that does not come into contact with the technology. All wastewater in contact with the technology will be discharged to the public process industrial wastewater network as treated process industrial wastewater after the treatment process in the PS building.

The stormwater networks will be developed as separate and independent networks within the site, separate from the municipal wastewater network and the industrial process wastewater network.

Within the area, the following independent and separate networks will be developed:

1. Wastewater:

    1.1. Municipal wastewater (only wastewater of non-technological, municipal nature)

    1.2. Technological industrial wastewater (treated wastewater of an industrial nature in contact with technology)

2. Stormwater

    2.1. Clean rainwater network (falling on roof surfaces)

2.2. Potentially oil-contaminated stormwater network (falling on paved surfaces).

4.6.2.1. Sewage disposal

Urban waste water

Access point: from the road 0237/406, on the west side of the site.

Internal network: a municipal sewerage network bypassing the planned buildings within the plot, according to the building engineer's discharge data, which will only discharge wastewater of municipal origin, in compliance with the regulations on the discharge and use of water pollutants as set out in Government Decree 28/2004 (XII. 25.) KvVM. The MU building will be equipped with an external grease trap adapted to the kitchen technology.

Establishment of a quantity measuring point: a municipal wastewater flow measuring point will be established on the pressurised branch of the municipal wastewater pipeline.

Urban waste water service point: urban waste water flow metering manhole.

Quality sampling point: a sampling well will be installed in a fenced area on the site boundary in front of the point of discharge, which is accessible from the outside. In all cases, the quality of the discharged urban waste water will comply with the requirements of Government Decree 28/2004 (XII. 25.) KvVM.

Technological, industrial waste water

Access point: from the road 0237/406, on the west side of the site.

Internal network: the effluents from the technologies, depending on their quality, are separately discharged via an internal network to the plant wastewater treatment plant located in the PS building (for a more detailed technical description of the wastewater treatment plant, see chapter 4.4.3.5). The treated process industrial wastewater is partly recycled to closed system process streams (gas scrubber wash water) and partly discharged to the external utility process industrial wastewater network.

Establishment of a measuring point: the process industrial effluent discharged will be measured both qualitatively and quantitatively, with a test well being established in a fenced area of the development site, which will be accessible to the operator/authority from outside the site boundary at any time, independently of the operation of the plant. The manhole will also house the meter and the sampling point. In all cases, the process industrial effluent discharged must comply with the limits for process industrial effluent set out in the Waterworks' discharge statement.

Technological industrial wastewater service point: technological industrial wastewater flow

metering manhole. Treatment of wastewater generated in the technology:

- is sent to the treatment plant in the PS building through a closed network and after treatment is either partially reused or discharged to the process industrial wastewater network
- collected in a storage container and then transferred to a third party authorised to handle the waste
    - waste name: aqueous suspensions of paint or varnish containing organic solvents and other dangerous substances
    - waste identification code: 08 01 19*
    - waste name: NMP waste (liquid)
    - expected annual volume: 24 176,95 t/year
    - on-site collection point: NMP tank farm (NT)
    - on-site collection method: tank collection
    - intended treatment: R2 (Solvent recovery, regeneration)
- is collected in IBC containers and then transferred to a third party authorised to handle the waste
    - waste name: other solvent and solvent mixture
    - waste identification code: 14 06 03*
    - waste name: DMC

- expected annual volume: 196,795 t/year
- place of collection on site: DW building
- on-site collection method: barrel/IBC
- intended use: R1 (primarily for combustion, use or other energy production)

The on-site process industrial network for process wastewater is gravity and pressurised, and process industrial wastewater is connected to the pressurised public network via a pressurised branch.

Requirement for technological waste water pipelines to the treatment plant for untreated waste water:

- all underground process wastewater pipelines are considered as potentially contaminant-carrying pipelines, and only stainless (min. material grade 1.4404), min. The pipelines must be made of steel pipe with a wall thickness of series 3 according to DIN EN 10253-2, only welded in covered parts (seamless or longitudinally welded pipe only according to test class TC1), the pipelines must be subjected to a pressure test according to EN13480-5 before covering (minimum test pressure: min. 3 bar(g) or 1,47 times the design pressure); flanged or other pipe connections shall only be made in manholes (manholes shall be provided with a liquid-tight, chemical-resistant coating.
- all above-ground process wastewater pipelines are considered as potentially pollutant-carrying pipelines, and therefore only stainless (min. material grade 1.4301), min. The pipelines must be made of steel pipe with a wall thickness of series 3 according to DIN EN 10253-2, exclusively of welded design (seamless or longitudinally welded pipe only according to test class TC1), the pipelines must be subjected to pressure test for pressure resistance according to EN13480-5 before insulation (minimum test pressure: min. 3 bar(g) or 1,47 times the design pressure); mainly welded fittings to be used, flange joints only in the most necessary places, other joints (e.g. flange, camlock, etc.) should be avoided, cuffs to be used as spill protection at pipe joints in case of flange joints

Requirement for process wastewater pipelines downstream of the wastewater treatment plant for treated process industrial wastewater:

- all underground process wastewater pipelines are considered to be potential pollutant carrying pipelines, however, after the treatment plant, the network will carry treated process industrial wastewater, which, in accordance with the material of the receiving public sewer network, will be made of KPE PE100 material, class SDR11 pipe, with a minimum pressure rating of PN10, marked with the brown colour code as specified. The products to be installed shall comply with the technical requirements laid down in the product standards MSZ EN 12201 and MSZ EN 1555. The watertightness test of the completed manholes, structures, gravity pipelines shall be carried out in accordance with clause 1.4 of the standard MSZ EN 1610:2001, in accordance with the standard MSZ EN 805:2000. Pressurised pipelines shall be subjected to a pressure test with a test pressure of one and a half times the working pressure + 1,0 bar. The material quality of the gravity network shall be PVC-U, the manholes shall be prefabricated reinforced concrete manholes, chemically resistant, with a continuous liquid-tight coating.

4.6.2.2. Stormwater drainage

Based on the declaration of principle of the Mayor's Office of the City of Debrecen, City Management Department, the drainage ditch is the final recipient of the stormwater, which is being rebuilt on the southern border of the planning area, the parcel 0237/395, within the framework of another project, and the final recipient of its waters is the Látóképi-víist Reservoir marked L- 1. Two connection points to this drainage ditch will be constructed on the southern side of the development site to discharge stormwater runoff from the development site. Based on the Reception Statement, there is another stormwater inlet point on the west side of the site, at 0237/406, but no stormwater connections are planned to this inlet point from the site.

In order to reduce the simultaneous hydraulic load of the public stormwater drainage system and the receiving ditch, on-site stormwater tanks are established for the purpose of storing and delaying stormwater, which are designed according to the declaration of principle of the City of Debrecen, the Mayor's Office of the City of Debrecen, City Management Department. All elements of the stormwater collection, drainage and storage system will be designed and constructed in a watertight manner.

Two separate internal stormwater networks will be constructed in the planning area:

- a "clean" stormwater drainage network for the planned buildings, based on the building services discharge and outfall points
- a "potentially oil-contaminated" stormwater drainage network for stormwater runoff from proposed roads and outdoor parking areas, based on the sinkholes and swales depicted on the road construction plans

The "potentially oil-contaminated" stormwater drainage network will be equipped with Pureco ENVIA TNP oil interceptors to ensure that only stormwater of a quality below the required limit is discharged into the public stormwater network. The oil traps will be installed in prefabricated manholes to ensure maintainability, and the manholes will be coated with an oil-resistant epoxy coating to protect the groundwater. The rainwater treated by the oil traps can be combined with clean rainwater.

The internal stormwater drainage system can be disconnected from the public stormwater drainage system, and in case of an emergency, the contaminated stormwater runoff can be discharged to the process industrial wastewater network. A flow metering point will be installed before the connection.

The investor is investigating the possibility of using rainwater to provide make-up water for the cooling towers, which would further reduce the annual water consumption of the factory.

<u>Rational scaling method - Stormwater storage</u>

The sizing procedures and parameters are based on the Government Decree No.147/2010 and the design practice adopted by the Contracting Authorities, Managing Authorities and the National Water Directorate General's Instruction No.1/2021.

<u>Determination of precipitation intensities:</u>

In order to determine the intensity ($_{ip}$) according to the National Hydrological Directorate's Instruction No. 1/2021, the first step is to download from the open database of the National Meteorological Service (NMS) the following data for the planning area intensity data (i_{p-10}, i_{p-20}, i_{p-30}, i_{p-60} (mm/h)) for 10, 20, 30 and 60 minutes for a given return period (p) determined from the data of the 5 nearest rain gauge stations. The average of the data from the 5 stations is converted into l/s*ha to obtain the measured intensities.

Average data for the 5 nearest stations based on OMSZ:

9. Table 3: Measuring rainfall intensities based on average data from the 5 nearest stations

	Intensity - i_p (l/s*ha)			
	10 minute	**20 minutes**	**30 minutes**	**60 minutes**
1 year 100%	113	83	64	38
2 years 50%	172	126	99	58
4 years 25%	214	160	126	76
5 years 20%	**227**	170	135	82
10 years 10%	264	202	161	102
20 years with 5%	299	234	188	125
50 years 2%	346	280	227	162
100 years 1%	382	317	260	199

Determination of return period/frequency:

Based on the standard EN 752:2017, the requirements for the return time for each type of built environment are as follows (Instruction OVF 1/2021, Annex 1, Table 1):

10. Table 1: Measuring rainfall frequency (n) and return frequency

	Measuring rainfall frequency (n) once a year	**Return frequency per year**
Suburban	1	100%
Residential area	2	50%
City centre, industrial area, commercial zone	***5***	***20%***
Underground railway installations, underpasses	10	10%

As required by the OVF, an internal stormwater drainage system will be constructed within the scope of this project to carry the design stormwater runoff from a rainfall event of 227 l/s*ha intensity, defined as a 10-minute duration event with a 5-year frequency.

Taking into account the expected impacts of climate change:

The effects of climate change are taken into account by a safety factor for climate impact (K). This value expresses the extent to which the intensity value for a given probability ($_{ip}$), calculated from statistical processing of past data, should be increased in the future to account for climate change. The longer the lifetime, the longer the return period, the higher the multiplier value that can be used. The choice of the climate impact safety factor (K) is based on the lifetime and vulnerability of the planned installation, as set out in Table 5 of Annex 1, Appendix 1, Instruction OVF 1/2021:

11. Table 3: Taking into account the impact of climate change on rainfall intensity

Return time								
p [year]	**1**	**2**	**4**	**10**	**20**	**33**	**50**	**100**
Internal area	1,1	1,1	1,1	1,1	1,1	1,2	1,2	1,2
Small settlements	1,1	1,1	1,1	1,1	1,1	1,2	1,2	1,2
Urban residential areas	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2
City centres, industrial areas	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2
Suburban	1,1	1,1	1,1	1,1	1,1	1,2	1,2	1,2

In this case, the K-factor is 1.2, as required by the OVF.

Determination of the run-off factor

The runoff coefficient (α) is the ratio of runoff to precipitation falling from the area. Its value is influenced by a number of factors. The value of the run-off coefficient is defined in MSZ 15300 for each type of surface (e.g. roof, seamless pavement, cobble pavement, etc.). Technical Guideline MI-10-167/3: 1975 gives the run-off coefficient in a similar way to MSZ 15300, but describes more surface types. The indicative values of the run-off factors are based on Table 7 of Instruction OVF 1/2021, Annex 1, Table 7:

Felületfajta	Lefolyási tényező
1.	2.
Tetőfelületek	
Fém és palatető	0,95-0,90
Cseréptető	0,90-0,80
Lapos tető	0,80-0,70
Útburkolat	
Aszfalt vagy beton burkolat	0,90-0,85
Kiöntött hézagú kőburkolat	0,85-0,90
Kiöntetlen hézagú kőburkolat	0,70-0,50
Makadám burkolat	0,48-0,25
Kavics utak	0,30-0,15
Egyéb felületek	
Burkolatlan földfelület	0,15-0,10
Park, kert, temető	0,10-0,05
Sportpályák	0,20-0,10
Erdő, rét	0,10-0,03
Üzleti negyedek	
Városközponti	0,70-0,95
Alközponti	0,50-0,70
Lakóterületek	
Családi házas	0,30-0,50
Lakótömbök pontházakkal	0,40-0,60
Lakótömbök összeérő blokkokkal	0,60-0,75
Külváros	0,25-0,40
Villanegyed	0,50-0,70
Ipari településrész	
Laza telepítésű	0,75-0,85
Sűrű telepítésű	0,75-0,95
Vasúti pályák	0,20-0,40
Laza telepítésű	0,75-0,85

In this case, both the paved and the roof surfaces have a runoff coefficient of 0.9, as specified in the OVF:

The size of the catchment areas was taken into account based on the current road construction and architecture data:

- 13,68 ha of built-up (roof) area
- 6,70 ha paved surface (roads and parking)
  total: 20,38 ha

Based on the rational method, the standard water yield was calculated according to the following relationship:

$$Q_m = i_p \cdot \sum(\alpha_i \cdot A_i) \cdot K$$

wher
e:

- i_p - precipitation intensity standard =227 l/s*ha
- α_i - run-off factor for a given area type =0,9

- $_{Ai}$ - sub-catchment =20,38 ha
- K - air conditioning safety factor =1,2
- **$_{Qm}$ - standard precipitation flow rate =4997 l/s**

Based on the above formula, the design rainfall is 4997 l/s, of which 1643 l/s is rainfall on paved surfaces, which may be subject to oil contamination, and 3354 l/s is "clean" rainfall on roof surfaces.

Sizing of a rainwater retention reservoir:

According to the DMJV's stormwater receiving statement with the registration number ÜZEM- 340201-3/2023, ÜZEM - 201609-2/2024, the direct simultaneous discharge of stormwater from the entire site is 1250 l/s. The additional stormwater volume is to be retained on site. Within the scope of the present project, the retention of stormwater will be carried out through prefabricated reservoirs.

The volume of the reservoir was determined in accordance with the OVF specification and the Hungarian-Russian design practice to be capable of retaining a 10-minute rainfall event with a return period of 5 years for 30 minutes.

Determination of reservoir volume:

$$V=\frac{(Q_m-Q_b)*60*30}{1000}$$

where:

- $_{Qm}$ - standardised rainfall for the whole area = 4997 l/s
- $_{Qb}$ - direct rainfall discharge to the receptor = 1250 l/s
- V - volume of the retention reservoir = 6744 m^3

On the basis of the above, a total of 7000 m^3 of reservoir will be constructed. In order to optimise the planned drainage network in the area, two subsurface stormwater tanks, each with a total volume of 3500 $m^{(3),}$ will be constructed, one under the parking area in the southern part of the site and the other under the green area in the south-eastern part of the site. Each stormwater storage tank will be constructed using Pureco type tubular steel elements connected in series and in parallel, or other equivalent technical solution. The reservoirs are designed to allow surface sampling for monitoring purposes.

4.7. Gas supply

4.7.1. Gas supply existing status

The gas supply pipeline and connection point is available within the eastern part of the planning area, within the boundary of the site, from parcel 0237/400. The existing pipeline is DN200 PE 6.0 bar(g) a working pressure of 6.0 bar(g) and has the capacity to meet the gas demand of the plant, no network upgrades are required. The gas distribution pipeline is operated and owned by OPUS Tigáz Zrt.

4.7.2. Gas supply planned status

The gas metering and pressure control station will be located north of the existing gas connection point. From the existing connection point, the primary D200 PE line of the metering and regulating station is designed in a protective conduit so that the protective zone is secured from the porter building and the adjacent property boundary. The planned utilities have been taken into account and the measured protection distances from the utilities have been observed when the primary line is laid out.

The fittings and technical parameters of the gas metering and pressure regulating stations are selected according to the exact gas demand and operating pressure. The pressure control cabinet will be equipped with two pressure regulators, one for low pressure and one for medium pressure gas supply to the consumer gas piping system. The low pressure system will supply the gas equipment, mainly kitchen equipment, designed for the MU building. Low pressure gas metering for this system will be located in the control cabinet. The medium pressure system will supply the gas consuming equipment (steam and hot oil boilers) in the Supply Station (PS) building. The gas metering of this system will also take place in the metering and control cabinet, but still in the primary branch.

In determining the route of the gas pipelines (MU; PS) supplying the two buildings above, the requirements of the technological instructions of the local service provider were taken into account. The planned utilities have been taken into account and the protection distances from them have been respected.

The gas supply to the MU "Multifunctional Building" will be provided by D110 PE SDR17.6 polyethylene piping with a low working pressure (30.0 mbar). In this building, gas will be supplied to the gas-fired kitchen equipment serving the catering.

The gas supply to the PS "Supply Station" building will be provided by D400 PE SDR17,6 polyethylene piping with a medium working pressure (2.0 bar).

4.8. Substation (SU)

A new 132/11 kV transformer station will be built by the Licensee. According to the investor's declaration, the electrical demand of the industrial plant is 69 MVA. The transformer substation consists of 2*132 kV cable receivers, 2*132 kV transformer branch circuits and 1 busbar disconnector compartment. The 2 *126/11 kV transformers are designed for outdoor use, therefore a 132 kV cable connection from the field installation to the open space has to be built, similar to the 11 kV outlets. The 11 kV cable tray of the transformers will be accommodated by an indoor 11 kV air-tight switchgear. The equipment shall be of single busbar design with a single longitudinal breakdown. The 126/11 kV transformers connected to the 132 kV busbar supply half of the 11 kV busbar. The circuit breaker of the 11 kV busbar cannot connect the two transformers, so the transformers can only operate in split mode. The 132 kV neutral point is directly earthed, while the 11 kV neutral point is earthed through a resistor. The auxiliary operation is provided by 2 11/0,4 kV auxiliary transformers connected to the busbar. The 11 kV branches supply additional sub-distributors, 11/0,4 kV consumer transformers or 11 kV capacitor banks. All equipment except the capacitor banks and transformers is located in the central control and switch building. For the 126/11 kV transformers, the industrial plant is equipped with an airtight 11 kV connected via a voltage switchgear. The 2 transformers supply a single enclosure switchgear, longitudinally split.

The equipment used must comply with current Hungarian and international standards. As in the case of the secondary system, in accordance with the connection planned with the primary layout, substation owned by OPUS-TITÁSZ and industrial plant must as independent as possible from each other, but the same principles and equipment must be used at the technological connection points (e.g. 132 kV cable protection, connection between control head-end machines).

Equipment directly connected to the network (the operation of which is directly critical for the safe operation of the municipal network) can only be built with equipment and solutions to which OPUS-TITÁSZ contributes. The connection of the two substations will require the construction of an underground cable network that will provide the connection between the Debrecen Macs 132/22 kV and the Debrecen Eve 132/11 kV transformer substation. (The underground cable providing the connection will be owned and operated by OPUS-TITÁSZ after construction. The assessment of the impact of the off-site infrastructure works was carried in the preliminary study on the establishment and provision of infrastructure for the Debrecen North-Western Economic Belt, which was concluded by the decision HB-03/KTF/00117-2/2019.)

A central switchgear and control building will be constructed on the station site, housing the 126/11 kV transformer, the associated 132 kV combined head and surge arrestor, and all primary equipment except the long earth resistor and capacitor banks, and the protection, control, auxiliary operation and communication equipment serving them.

The following secondary process units will be installed:

- 145 kV encapsulated gas-insulated switchgear and protective and control equipment,
- 11/0.4 kV auxiliary transformers,
- DC and AC auxiliary distributors,
- Continuous distributor,
- Communication equipment,
- 11 kV switchgear,
- building services and building services installation systems,
- Storage
- Social block (bathroom, toilet)

4.8.1. Havaria treatment

4.8.1.1. Transformer base

Hot-dip galvanized walking beam elements are placed on the shoulders of the monolithic reinforced concrete structure and on the hot-dip galvanized hot-rolled steel support structure, which carry the basalt chips for cooling the spilled oil. The basin areas underneath the millings will be insulated with a layer of Carbofol HDPE 2 mm foil oil-resistant insulation board. The slope of the oil compartment under the insulation slab is ensured by a 6-11 cm thick concrete slab prepared on the reinforced concrete slab. The two basin sections are sloped in the middle. At the deepest point, under the insulation slab, a 50 mm diameter PVC pipe will lead to the manholes. After the insulation plates have been cut they are welded together on site. Oil protection of the visible concrete surfaces above the shoulder is provided by KESTON AC primer and KESTON FLEX 2 topcoat. The visible edges of the pool wall shall be formed with Bauplast DFH 30 formwork panels.

4.8.1.2. Hydrocarbon separation manhole

Stormwater contaminated with oil

Oil-contaminated rainwater run-off from the transformer bases being built will be collected in a closed backbone pipe that collects only the transformer rainwater. For the purification of the collected stormwater, it is planned to install an oil separator of type AQUAFIX SK 06/0600/H, from which the purified stormwater will be connected to the internal clean stormwater network of the factory. The stormwater volume was determined on the basis of a 2-year frequency (50%) 10-minute measured rainfall (270 l/s ha) with a runoff coefficient of 0.9.

Drainage areas: transformer bases are basin-trained to ensure that oil dripping from transformers can be captured and managed. Oil-resistant XYPEX surface treatment is used on the internal surfaces of the basins.

Data: transformer area: 77.33 m^2; runoff coefficient: 0.9; rainfall intensity: 270 l/s ha; rainfall volume: 1.91 l/s; Based on the previous data, the rainfall volume falling on the area at 20 minutes intensity 2.30 m3 of water.For 2 transformers, the standard rainfall volume is 3.83 l/s.

Type of hydrocarbon separator: in order to meet the volume of precipitation water generated and the operator's needs (large reservoir space, possibility of expansion), the oil separation unit chosen is AQUAFIX SK 06/0600/H.

KG-PVC pipe is used between the transformer pool and the hydrocarbon separation equipment.

Cable basement design: 2 layers of Mapei Flexo S6 Premium SBS modified flame-melted bituminous sheet waterproofing are applied on horizontal sections under the cable basement slab foundations. One layer of Mapei Flexo S6 Premium SBS modified flame-melted bituminous sheet waterproofing is installed in the ground floor above the cable basement. Two layers of Mapei Flexo S6 Premium SBS modified flame-melted bituminous sheet waterproofing will be applied to the vertical wall surfaces of the basement.

4.8.1.3. Surface management

The visible surface of concrete structures not exposed to oily contamination is covered with KESTON AC primer and KESTON FLEX2 topcoat. On pool walls exposed to oil contamination, XYPEX surface treatment is applied.

4.9. 11 kV - medium voltage systems

4.9.1. General description

The factory will receive electricity at 132 kV from the network owned and operated by OPUS-TITÁSZ Áramhálózati ZRt. Most of the buildings will be supplied from the 11 kV substation, which will be built on the site of the factory, as described in the previous chapter. The other part will be supplied from the 11 kV switchgear of the building supplied from the substation.

4.9.2. Buildings affected by the 11 kV feed-in

- AS - Assembly Plant
- EL - Electrode Plant
- FO - Forming Plant
- SO - Sorting Warehouse Plant
- PS - Supply Station
- MU - Multifunctional Building
- BS - Battery Test Lab
- RM - Raw Material Warehouse
- SU - Base station

4.10. Other electrical systems

4.10.1. Underground electrical equipment

The planned external electrical utility network for the following electrical systems:

- Medium voltage systems
- Low voltage systems, street lighting, electric car chargers
- Low current systems

For the systems listed above, a network of substructures is built to connect the different buildings.

Electricity is supplied via a TN-C system between the transformer station and the planned distribution equipment. A TN-S network will be installed for the area lighting and for the electric car chargers in the parking area, for the cables from the planned distribution points.

4.10.2. Grounding and single-potential system

A grounding and equipotential bonding system will be installed in the foundations of all buildings with an artificial earthing system.

Earthing designed according to MSZ EN 62305 and MSZ 18014.

For buildings, a type B earthing system is recommended. The main earthing point will be located in the main distribution rooms. All transformers will be provided with premises earthing points.

It is connected directly to the main earthing node or by means of protective bonding conductors:

- earthing of the building fault (contact protection)
- the PE/PEN rail of the distributors
- large metal objects in rooms and building structures (cable trays, metal ducts, continuous metal building structures, etc.)
- metal piping for water and domestic hot water supply
- possibly metallic sections of the sewerage network
- metallic sections of central heating pipework
- the possible creation of additional metal channels
- lightning protection earthing of the building

4.10.3. Lightning protection system

Safety clearances are taken into account when designing lightning protection systems consisting of roof-mounted interconnecting conductors and suspension spikes. Metallic installations are only placed in protected zone $_{LPZ0B}$) and are not placed within the safety clearance of the pick-up and drop-off system.

In the building, the drainage points will be located in precast concrete piers, with fixed connection points in precast reinforced concrete columns at the appropriate heights as recommended in the standard. The system will be connected to the lightning protection system at the top and to the grounding of the building at the bottom.

The lightning protection equipment is designed with standard lightning protection (NV) according to the standard series MSZ EN 62305, in accordance with the BM Decree 51/2014 (XII.05.) and the national standard MSZ EN 62305 referred to therein. A risk management calculation is performed for each building to determine the level of lightning protection.

Planned design:

SO building

- LPS III lightning protection system
- LPL Class I power supply surge protection
- Contact voltage protection not required
- Step voltage protection not required
- Magnetic shielding not required

EL-AS-FO building

- LPS Level I lightning protection system
- LPL Grade I coordinated surge protection

RM-MU building

- LPS Level I lightning protection system
- LPL Grade I coordinated surge protection
- Contact voltage protection not required
- Step voltage protection not required
- Magnetic shielding not required

PS building

- LPS Level IV lightning protection system
- LPL I lightning protection level rated lightning protection equipotential bonding (power surge protection)
- Contact voltage protection not required
- Step voltage protection not required
- Magnetic shielding not required

BS building

- Explosive building or outdoor area
- LPS Level I lightning protection system
- LPL I lightning protection level rated lightning protection equipotential bonding (power surge protection)
- Contact voltage protection not required
- Step voltage protection not required
- Magnetic shielding not required

DW building

- Explosive building or outdoor area
- LPS II lightning protection system
- LPL I lightning protection level rated lightning protection equipotential bonding (power surge protection)
- Contact voltage protection not required
- Step voltage protection not required
- Magnetic shielding not required

LO-EM building

- Lightning protection system (LPS) not required
- LPL III-IV lightning protection level rated lightning protection equipotential bonding (power surge protection)
- Contact voltage protection not required
- Step voltage protection not required
- Magnetic shielding not required
- Eve Power Hungary Kft. decides whether it wants to provide a minimum level of protection for its buildings.

4.10.4. Coordinated surge protection

The planned coordinated surge protection system aims to provide a protection system that meets the SPM level required by the lightning protection risk management. It also aims to protect operationally critical, high-value electrical equipment (asset protection) from the harmful secondary effects of lightning strikes.

4.10.5. Low voltage electrical distribution

The low-voltage network is supplied via the main low-voltage distribution equipment for the area concerned. Process equipment and process-related mechanical equipment are supplied with electricity via the encapsulated rail. General installation and other small distribution equipment may be supplied directly via a cable from the main distribution equipment.

4.11. Monitoring systems

4.11.1. Backup lighting system

The central monitoring system of the back-up lighting system provides a display of the current status of the integrated individually addressable luminaires. It runs the test at the required intervals and generates a report, stores the test results for the required time and can be printed out at any time on request. In the event of a problem with the luminaires, it reports the fault event and the source of the problem.

The system provides a visualised indication of the luminaire status in real time, for which the building layout and the luminaires must be digitally positioned in the software. Capable of collecting data on the status of the control gear and battery. The system can be managed remotely with appropriate permissions and identification after login to the operating staff.

4.11.2. Electrical monitoring system

The electrical monitoring system continuously monitors the parameters of the electrical energy supplied by the electrical networks in the building, in order to detect possible overloads and failures in time, thus preventing longer service outages. Monitoring systems can record many parameters simultaneously, and their analysis provides a comprehensive picture of the quality of the electricity service. Using this, and reviewing the results every year of operation, more efficient operation is possible.

4.11.3. Building Management System (BMS)

The complete energy supply, operation, management, control and regulation of the building's mechanical systems (ventilation, heat and smoke extraction, heating, cooling) and the monitoring of the electrical supply systems are provided by a digital building automation and monitoring system.

The BMS system collects the individual emergency signals (gas detectors, solvent vapour detectors, process plant signals, liquid detectors, etc.), which issue the necessary alarms and interventions to avoid emergency situations.

4.12. Low current systems

4.12.1. Fire alarm system

complete, addressable, analogue, intelligent fire alarm system will be installed to protect buildings

The solutions used in the plan meet the requirements of the Decree of the Minister of Interior 54/2014 (XII. 5.) BM on the National Fire Safety Regulations.

The fire alarm system is subject to a separate procedure for approval by the competent disaster management authority. The fire alarm plans are drawn up in accordance with "Government Decree 491/2017 (XII. 29.) on the detailed rules of the official procedure for the approval of the installation, commissioning and removal of fixed fire alarm and fire extinguishing systems".

The fire alarm system service

- Fire detection
- Fire detection

- Fire alarm
- Fire controls
- Support for detection and intervention

4.12.2. IP video system

The IP-based video surveillance system allows the monitoring of events in the object, as well as the recording of these events and the subsequent evaluation of the images.

4.12.3. Access system

The main function of the access controller is to manage the entry/exit of the designated access point, and to receive the reader's signals. At the access point, employees and guests are admitted using cards/TAGs or face recognition.

4.12.4. Structured network

A single LAN network will be installed throughout the facility, serving multiple systems. These are:

- Internal communication/offices/rooms (telephone, computers)
- Security camera system
- Reliable internet connection and infrastructure

4.12.5. GSM Service

User access to the highest level of mobile phone service should be ensured inside and outside the building. The design/construction shall take into account the positioning of external antennas, internal amplifiers and the cable network.

4.12.6. EDR system

The EDR (Unified Digital Radio System) is a mobile radio network providing nationwide coverage, which ensures efficient communication between police, ambulance, disaster management and public safety agencies, and is operated by Pro-M Zrt.

In order to maintain the security level of the building and to effectively deal with emergency situations, it is necessary to install base station(s) in the above and below ground areas to ensure that communications can be maintained even with RF shielding architectural design.

The exact design of the system and the network structure should be determined by measurements after the building structure is ready.

4.13. Solar panel system

Based on the current plans of the applicant, a solar farm with a total installed capacity of 13.2 MW is planned to be built at the facility in order to reduce the electricity consumption of the facility. The electricity generated will be used on-site and will not be fed back into the electricity grid, as a result of the continuous use of electricity. The current

The solar panels are planned to be installed on the roofs of part of the buildings to be constructed, for a total surface area of ~132 000 m^2, as shown in the table below. The solar PV system is tentatively scheduled to be installed by the end of 2026.

12. Table 1: Main data of the planned solar PV system

Name of building	Coverage of areas, where solar panel installation is planned (m^2)	Estimated total installed planned Capacity (MW)	Annual usable sunshine hours (h)	Annual electricity produced (MWh)
Forming Plant	31 133	13,2	1 018	13 445,6422
Assembly Plant	27 392			
Electrode Plant	24 931			
Sorting Warehouse Plant	28 724			
Above parking area	11 068			
Multifunctional Building	2 431			
Raw Material Warehouse	6 400			

4.14. Environmental impacts of technology

The proposed facility will generate traffic for the supply of raw and auxiliary materials and the delivery of product and waste. It should be noted that, as the product to be manufactured will be transported to the BMW site, no significant traffic-generating effects are expected from the transport of the products.

The raw materials and auxiliary materials delivered to the site are received in the Raw Materials Warehouse (RM), the Dangerous Goods Warehouse (DW), the NMP Tank Farm (NT) and the Electrolyte Tank Farm (ET). With the exception of NMP and electrolyte, all supplied raw materials and auxiliary materials are stored in sealed packaging until use. Materials arriving by truck are unloaded in the RM building by automatic loading machines or forklift trucks and then fed into the automatic loading system at the loading point.

For NCMA and NCM dust with hazard characteristics, the big-bag bags are delivered by truck on pallets. The vehicle loads into the dock gate. The pallets are lifted from the vehicle into the receiving area of the warehouse by an automatic loader. If the consignment is not suitable for automatic unloading, it is returned according to internal instructions. If the package arrives damaged, the same procedure must be followed.

The big-bag is placed on a single (1200x1200 m) plastic pallet for internal transport together with the pallet. The removal of raw materials from the warehouse system is a material handling process carried out by automatic systems. In all cases, the removal is carried out per whole storage unit, and the storage units are not split up within the warehouse.

Safety specifications, work instructions and training are planned for the handling of incoming hazardous materials. The automatic conveyor systems used will be equipped with proximity sensors to prevent the unit pack from tipping over due to a collision and the associated material spillage within the building.

These are moved on the conveyor and then the pallets are lifted onto the pallet for internal use by an automatic machine. At this position, the pallets' delivery code and the barcode of the internal pallet are scanned together, and the Warehouse Management System (WMS) records the materials stored in the warehouse, their quantity and their storage location.

An integral part of the technology is the quality testing of the raw and auxiliary materials used, which is carried in the RM building, so no laboratory activities are planned in the DW, NT and ET buildings, and in the DW building, all hazardous materials are stored in sealed packaging. The supply of the quality assurance areas in the RM building will be carried out using dedicated sample packages, which will not require the dismantling of packaging within the RM building to ADR requirements.

The materials to be used will be delivered to the application areas in sealed packaging or, in the case of NMP and electrolyte, in sealed pipelines (for details on the latter, see Sections 3.2.8 and 3.2.9). The thermal oil system that supplies the heat to the technology will also be delivered to the technology in sealed pipelines from the Supply Station (PS) building as described in Section 3.2.7. Pipelines for the transport of hazardous materials will be installed above ground level on dedicated pipe bridges. From the RM building to the application area, the materials will be discharged by means of an automatic conveyor roller system via connecting bridges to the AS and EL buildings. The pallets for transport to the RM building are also conveyed by the automatic system.

The movement of intermediate workpieces to the following process areas and the transfer of raw and auxiliary materials to the application area is also designed with automatic transfer systems (conveyor belt or automatic forklift (AGV)), thus reducing the risk of accidents due to human error. Batteries will be moved to and between the FO and SO buildings on automated roller conveyors and then by robots, and in the SO building to the high storage areas.

The finished product is delivered by automatic loading. The palletised pallets of finished goods are loaded onto the truck either from the finished goods high-bay warehouse or from the packing area on an automatic roller conveyor system. On release from the high-bay warehouse, the automatic loading machines move the WMS-designated pallets from the rack storage areas to the unloading tracks, from where they are transported to the automatic loader. If loading takes place directly from the packing line, the packed finished product pallets are delivered directly to the automatic loading system.

The technology uses materials in closed systems. Depending on the technology used, it is planned to install direct extraction systems for the whole airspace of the room or for the specific process source, connected to separation equipment as described in the relevant subsections of Chapters 4.3 and 4.4 and in Chapter 7.1.3. The associated emissions are associated with air quality control point sources subject to permitting.

The semi-finished and finished batteries go through a multi-stage quality control and grading process, which is planned in the SO, MU and BD buildings. Batteries found to be unsatisfactory during quality control are de-energised using dedicated equipment, thus reducing the risk of waste. If the fault is of such a nature that the battery cannot de-energised by normal methods, the battery will be dismantled in the BS building and then in the BD building de-energising the anode foil. For this activity, the Licensee applies for a waste management permit, information on which can be found in chapter 7.4.3.

Workplace and plant collection points are planned to collect other waste generated by the technology. Detailed information on the planned waste management activities is given in chapter 7.4.2.

Wastewater from the process will be treated in the on-site wastewater treatment plant, which will be installed in the PS building (see section 4.4.3.5). The plant will be supplied with process steam (see section 4.4.3.2) and thermal oil (see section 4.4.3.1) by gas boilers, also planned to be installed in the PS building. Detailed information on the associated air quality point sources is provided in chapter 7.1.3.

The technological water needs of the facility are planned to be supplied from industrial dilution water and grey water supplied by Debreceni Vízmű Zrt. Within the site, the industrial dilution water and grey water received will be subject further treatment, information on which is provided in section 4.4.3.6.

The collection of rainwater in the planning area is planned in a closed system with the construction of stormwater reservoirs. The pollutable water collected in the area will be treated in a Pureco ENVIA TNP type oil trap prior to discharge into the reservoir. Stormwater will be tested prior to discharge. The investor is investigating the possibility of using stormwater to provide make-up water for the cooling towers, which will further reduce the annual water consumption of the factory.

On the basis of the above, the installation will not cause an impact on surface water, groundwater and the geological medium above the limit values during normal operation. The cooling towers with significant water use are planned to be operated with grey water supplied by Debreceni Vízmű Zrt. Information on potential hazard events and their mitigation can be found in the subsections of chapter 4.4 and in chapter 4.14.4.

The cooling of the buildings and the supply of the cooling demand of the technology is planned with the cooling water supply systems mentioned above, connected to cooling towers. The heating needs and the production of hot water for domestic use are planned to be supplied from the steam system supplying the heat to the technology, from the waste heat from the condensate water from the steam system and from the waste heat from the compressed air and nitrogen supply system, so that no additional combustion plant is required. In the EM and LM port function buildings, split-system cooling/heating split units provide winter heating and summer cooling.

Clean room process areas are planned for a large part of the facility, some of which have strict humidity requirements. It is also necessary to ensure that the spaces are ventilated for comfort. Accordingly, a significant number of air handlers are planned to be installed in the facility, typically in mechanical spaces and a smaller percentage on the roof structure of the building. The air handling equipment will generate radiated noise and ductwork for air supply and used air discharge. Other sources of noise include emissions from cooling towers and the compressed air and nitrogen supply system planned to be installed in the PS building, as well as air pollution control point sources and associated separation systems. Noise sources to be investigated include parking areas, internal circulation routes, and facades of buildings where interior noise activities are planned. Detailed information on the noise impact of the installation is given in chapter 7.9.4.

4.14.1. Measures to reduce environmental pressures

The boilers supplying the heat for the technology are LOW-NOx high energy efficiency units. The steam supply for the process will be partly provided by electrically driven steam generators, thus reducing grid losses and flue gas emissions.

In order to minimise air pollutant emissions from the technology, process spaces or process equipment will have direct extraction, which will undergo a multi-stage capture prior to emission. By installing an appropriate capture system, the permit applicant has voluntarily undertaken to comply with an emission limit of 1 mg/m^3 for NMP emissions, which is stricter than the current limit value. In addition, the installation of capture equipment with a 99.99% efficiency is planned to minimise the dust load.

The licensee has also undertaken to construct buildings enclosing the NMP and electrolyte tank farms and the containment area, thus further reducing the potential for accidental impacts.

The installation of a complex wastewater treatment system is planned, as well as the installation of a system for further treatment of the grey water supplied.

Stormwater is collected in a closed collection system to prevent possible pollution.

In areas where large quantities of hazardous liquids are used, the installation of prefabricated structures (as part of the process equipment) or additional containment layers is planned. For detailed information on damage control layers, see section 4.14.1.1.

The renewable energy will be provided by solar panels on the roofs of the buildings and on the scaffolding above the parking areas. Information on the solar PV system can be found in chapter 4.13.

For the NMP to be used in the facility, an agreement is planned to be signed with a specialist company that will purify the used NMP to produce industrial grade NMP. Based on operational experience, the actual annual NMP consumption can be reduced by about 90%.

A plant collection point will be set up for the collection of hazardous waste generated on the site, which will fully comply with the requirements of Article 14 and Annex 2, point 1.2.2 of Government Decree 246/2014 (29.IX.).

4.14.1.1. Mitigation areas and pavement designs

The location and planned layering of the various remedial and groundwater and geological layers is shown on the detailed site plan in Annex 2.3.

The following general considerations have been taken into account in the design of the layering schemes for buildings:

- In the case of passive storage, where the materials are stored in their original packaging, unopened, no spillage is expected, storage is required or planned according to ADR regulations. In addition to this basic principle, all passive storage areas have a minimum of two additional layers of protection to minimise the risk of accidental spillage.

- In all cases, a minimum of double protection is provided against the escape of liquids.
- In all cases, double protection will be provided - primary protection by means of a technically compliant damage barrier (for the whole room or specific to the equipment) or double-wall design; secondary protection by means of a chemically resistant, liquid-tight, continuous floor design with a suitable receiving surface
- The design of the technology is always enclosed, and the primary aspect of its design is to fully comply with environmental, health and safety, fire protection requirements, in addition to the legal requirements, by using the designs detailed in the technology specification (e.g.: protective cuffs, increased performance seals, etc.)
- Small quantities of alcohol and other cleaning products are always stored in a fire-safe cabinet with its own fire protection. Therefore, in the event of an accident, these storage rooms can be used to prevent hazardous substances from being spilled on the floor. These alcoholic and other cleaning agents are used in minimum quantities (~125-1000 ml/h) exclusively for cleaning purposes, the cleaning process is carried out with special soaked wipes, so no spillage is expected. Only the quantity currently in use is stored in the cleaning area in a dedicated space in a damage container.
- The storage/testing/transport of unfinished (unsealed) batteries charged with electrolyte is carried out in trays, and a chemically resistant, liquid-tight, continuous, non-sparking, conductive floor is planned as secondary protection.
- In rooms where liquid leakage may occur in case of an emergency, liquid sensors will be installed to enable automatic detection and intervention.
- Gas and/or solvent vapour detectors will be installed at the relevant locations, also allowing automatic detection and intervention.
- The BMS collects the signals that allow for the prevention of accident situations and automatic intervention in the event of an accident (fire alarm, gas/solvent detection system, liquid sensors, process plant signals), which greatly reduce the possibility of an accident occurring and provide an automatic signal and intervention in the event of an accident
- In the case of hazardous liquids stored in large quantities in waste collection areas, HDPE film is planned to be installed under the building part or the entire building, connected to a leakage monitoring system, which fully complies with the requirements of Government Decree 439/2012 (XII. 29.).

Based on the above, HDPE film protection has been planned in cases where it is justified by the technical design or the volume of liquid, or where required by law (DW, BS, BD building - waste collection, - storage areas). In all cases, the HDPE film is designed with a leakage layer, which allows monitoring of the area and fully complies with the requirements of Government Decree 439/2012 (XII. 29.).

During the design process, the primary consideration was to design the technological systems and buildings in such a way that they would prevent accident situations as much as possible. However, in all areas, protection elements have been designed to ensure that, in the event of a potential disaster, the disaster can be dealt with automatically and immediately as far as possible, and that all possible scenarios can be dealt with safely, thus avoiding environmental damage resulting from the disaster.

For NMP and electrolyte tank farms to be designed as enclosed buildings, the following layering schemes shall be developed
planned:

- NT building; Function: NMP storage (3a layer order)
    - The building has its own damage-resistant design, chemically resistant, liquid-tight, continuous epoxy cladding with a receiving surface to match the cladding
    - HDPE film tied to a monitoring well will be installed under the building
    - HDPE film is also installed under the drainage area (layer 3b)
    - The same layering as in the NT building is planned for the NMP transfer and waste NMP transfer room in the EL building (Layering 3a)
- ET building; Function: Electrolyte storage (3a layer system)
    - The building has its own damage-resistant design, chemically resistant, liquid-tight, continuous epoxy cladding with a receiving surface to match the cladding
    - HDPE film tied to a monitoring well will be installed under the building
    - HDPE film is also installed under the drainage area (layer 3b)
    - The same layering as in the ET building is planned for the electrolyte transfer room in the AS building (Layering 3a)

Under the DW building for the storage of hazardous waste and hazardous substances, under the BD building for the electrochemical treatment of anode foil and under the battery dismantling room group of the BS building, the following stratification is planned (3a stratification):

- Drainage pool with chemical-resistant and liquid-tight resin cover,
- HDPE film tied to a monitoring well will be installed under the building

In the PS building, the following layering is planned under the wastewater treatment room:

- Drainage basin with chemical-resistant and liquid-tight resin liner, with a receiving surface corresponding to the liner
- Under the room, HDPE film is installed on a monitoring well (3a layer system)
- Wastewater treatment basins will be lined with special glass fabric liners (Layer 2b) The

detailed layouts are given below.

- **<u>1.a Floor on soil with chemical resistant resin coating:</u>**
    - stored chemical-resistant continuous, liquid-tight, anti-slip, abrasion-resistant resin cover (non-sparking and conductive in RB zone)
    - industrial flooring - industrial flooring according to plans
    - 2 rtg. 0,2 mm vtg. PE foil sliding layer (e.g. MAPEI MAPEPLAN PE 020), laid 20 cm overlapped, surface reinforced with self-adhesive tapes
    - antifreeze crushed stone bedding - according to structural or civil engineering plans
    - 1 rtg. 125 g/m^2 plastic veil filter layer (e.g.: TYPAR SF 37) loosely laid with 15 cm overlaps, as required - according to structural or civil engineering plans
    - cultivated soil up to the level of coarse landscaping or compacted backfill (stabilized soil backfill if necessary), with load bearing capacity according to foundation design - according to structural or civil engineering plans

- **<u>1.b Ground floor with stainless steel cladding:</u>**
    - stored chemical-resistant, anti-slip stainless steel housing with continuous liquid-tight seams
    - industrial flooring - industrial flooring according to plans
    - 2 rtg. 0,2 mm vtg. PE foil sliding layer (e.g. MAPEI MAPEPLAN PE 020), laid 20 cm overlapped, surface reinforced with self-adhesive tapes
    - antifreeze crushed stone bedding - according to structural or civil engineering plans
    - 1 rtg. 125 g/m^2 plastic veil filter layer (e.g.: TYPAR SF 37) loosely laid with 15 cm overlaps, as required - according to structural or civil engineering plans
    - cultivated soil up to the level of coarse landscaping or compacted backfill (stabilized soil backfill if necessary), with load bearing capacity according to foundation design - according to structural or civil engineering plans
- **<u>2.a Drainage pool with stainless steel cover:</u>**
    - stored chemical-resistant, anti-slip stainless steel housing with continuous liquid-tight seams
    - liquid detection system
    - stored chemical-resistant continuous, liquid-tight, anti-slip, abrasion-resistant resin cover
    - min. 25 cm waterproof reinforced concrete slab - according to structural design
    - 2 rtg. 0,2 mm vtg. PE foil sliding layer (e.g. MAPEI MAPEPLAN PE 020), laid 20 cm overlapped, surface reinforced with self-adhesive tapes
    - antifreeze crushed stone bedding - according to structural or civil engineering plans
    - 1 rtg. 125 g/m^2 plastic veil filter layer (e.g.: TYPAR SF 37) loosely laid with 15 cm overlaps, as required - according to structural or civil engineering plans
    - cultivated soil up to the level of coarse landscaping or compacted backfill (stabilized soil backfill if necessary), with load bearing capacity according to foundation design - according to structural or civil engineering plans
- **<u>2.b Wastewater basin with special glass fibre enclosure:</u>**
    - stored chemical resistant, continuous, liquid-tight, conductive resin coating
    - watertight monolithic reinforced concrete slab (for blocking equipment in the pool)
    - 1 rtg. embossed plate
    - 2 mm glass frame reinforced layer
    - 2 mm special 3D glass fabric for monitoring
    - 2 mm glass frame reinforced layer
    - 0,5 mm primer coat
    - min. 25 cm waterproof reinforced concrete slab - according to structural design
    - 2 rtg. 0,2 mm vtg. PE foil slip layer (e.g. MAPEI MAPEPLAN PE 020), laid 20 cm overlapped, surface reinforced with self-adhesive tapes
    - antifreeze crushed stone bedding - according to structural or civil engineering plans

- 1 rtg. 125 g/m² plastic veil filter layer (e.g.: TYPAR SF 37) loosely laid with 15 cm overlaps, as required - according to structural or civil engineering plans
- cultivated soil up to the level of coarse landscaping or compacted backfill (stabilized soil backfill if necessary), with load bearing capacity according to foundation design - according to structural or civil engineering plans

- **<u>3.a With HDPE insulation and monitoring system:</u>**
  - stored chemical-resistant continuous, liquid-tight, anti-slip, abrasion-resistant resin cover (non-sparking and conductive in RB zone)
  - min. 25cm waterproof reinforced concrete slab - according to static plans
  - 2 rtg. 0,2 mm vtg. PE foil sliding layer (e.g. MAPEI MAPEPLAN PE 020), laid 20 cm overlapped, surface reinforced with self-adhesive tapes
  - ~30-40 cm antifreeze crushed stone leachate layer according to static plans, including HDPE chemical resistant drainage pipes leading into a control well
  - 3 cm of compacted sand or 0,4 mm crushed stone
  - 1 rtg. 400 g/m² non-woven polypropylene geotextile protective layer (e.g. NAUE SECUTEX PP R-401)
  - 1 rtg. 2.0 mm thick acid and alkali-resistant HDPE waterproofing sheet (e.g. NAUE CARBOFOL HDPE 612), surface-fused by waterproof welding, installed 10 cm above the floor line and held in place by mechanical fastening
  - 1 rtg. 400 g/m² non-woven polypropylene geotextile backing layer (e.g. NAUE SECUTEX PP R-401)
  - 3 cm of compacted sand or 0,4 mm crushed stone
  - antifreeze crushed stone bedding - according to structural or civil engineering plans
  - 1 rtg. 125 g/m² plastic veil filter layer (e.g.: TYPAR SF 37) loosely laid with 15 cm overlaps, as required - according to structural or civil engineering plans
  - cultivated soil up to the level of coarse landscaping or compacted backfill (stabilized soil backfill if necessary), with load bearing capacity according to foundation design - according to structural or civil engineering plans
- **<u>3.b Drain with HDPE insulation and monitoring system:</u>**
  - 16 cm non-sparking, chemical-resistant basalt concrete pavement (CP4/2,7) according to the road plan
  - 15 cm road base (CKt-4 cement stabilisation) according to road plan
  - 2 rtg. 0,2 mm vtg. PE foil sliding layer (e.g. MAPEI MAPEPLAN PE 020), laid 20 cm overlapped, surface reinforced with self-adhesive tapes
  - ~30-40 cm antifreeze crushed stone leachate layer according to static plans, including HDPE chemical resistant drainage pipes leading into a control well
  - 3 cm of compacted sand or 0,4 mm crushed stone
  - 1 rtg. 400 g/m² non-woven polypropylene geotextile protective layer (e.g. NAUE SECUTEX PP R-401)
  - 1 rtg. 2.0 mm thick acid and alkali resistant HDPE waterproofing sheet (e.g. NAUE CARBOFOL HDPE 612),
surface-welded with waterproof welding, up to 10 cm above the floor line

- 1 rtg. 400 g/m^2 non-woven polypropylene geotextile backing layer (e.g. NAUE SECUTEX PP R-401)
- 3 cm of compacted sand or 0,4 mm crushed stone
- antifreeze crushed stone bedding - according to structural or civil engineering plans
- 1 rtg. 125 g/m^2 plastic veil filter layer (e.g.: TYPAR SF 37) loosely laid with 15 cm overlaps, as required - according to structural or civil engineering plans
- cultivated soil up to the level of coarse landscaping or compacted backfill (stabilized soil backfill if necessary), with load capacity according to foundation design - according to structural or civil engineering plans

- **3.c Substrate floor above slab-on-grade with HDPE insulation and monitoring system (DW or PS building):**
  - stored chemical-resistant continuous, liquid-tight, anti-slip, abrasion-resistant resin cover (non-sparking and conductive in RB zone)
  - industrial flooring - industrial flooring according to plans
  - 2 rtg. 0,2 mm vtg. PE foil sliding layer (e.g. MAPEI MAPEPLAN PE 020), laid 20 cm overlapped, surface reinforced with self-adhesive tapes
  - ~30-40 cm antifreeze crushed stone leachate layer according to static or civil engineering plans, including HDPE chemical resistant drainage pipes led into a control well
  - 3 cm of compacted sand or 0,4 mm crushed stone
  - 1 rtg. 400 g/m^2 non-woven polypropylene geotextile protective layer (e.g. NAUE SECUTEX PP R-401)
  - 1 rtg. 2.0 mm thick acid and alkali resistant HDPE waterproofing sheet damage protection insulation (e.g. NAUE CARBOFOL HDPE 612), surface flashed by waterproof welding, applied up to 10 cm above the floor line and held in place by mechanical fastening
  - 1 rtg. 400 g/m^2 non-woven polypropylene geotextile protective layer (e.g. NAUE SECUTEX PP R-401) - 1-10 cm of compacted sand or 0,4 mm crushed stone spreading
  - monolithic reinforced concrete slab base - according to structural design
  - 5 cm C10/16 precast concrete - structural design - frost-resistant crushed stone bedding - structural or
    according to civil engineering plans
  - 1 rtg. 125 g/m^2 plastic veil filter layer (e.g.: TYPAR SF 37) loosely laid with 15 cm overlaps, as required - according to structural or civil engineering plans
  - cultivated soil up to the level of coarse landscaping or compacted backfill (stabilized soil backfill if necessary), with load bearing capacity according to foundation design - according to structural or civil engineering plans

- **4.a Upstairs floor with chemical-resistant resin coating:**
  - stored chemical-resistant continuous, liquid-tight, anti-slip, abrasion-resistant resin cover (non-sparking and conductive in RB zone)
  - prefabricated reinforced concrete slab+ concrete slab - according to structural design

- **4.b Upstairs floor with stainless steel cladding:**
  - stored chemical-resistant, anti-slip stainless steel housing with continuous liquid-tight seams

- prefabricated reinforced concrete slab+ concrete slab - according to structural design

- **5. Upstairs floor with chemical-resistant resin flooring (floating layer system in MU building):**
  - stored chemical-resistant continuous, liquid-tight, anti-slip, abrasion-resistant resin cover
  - 9 cm mesh reinforced C20/25 substrate concrete, 5x150x150 B500B (BHB 55.50) with welded mesh (tensile adhesive strength: ≥1,5 N/mm^2 (B1,5), permissible moisture content: ≤2% (NCM2)), with shrinkage reducing additive (e.g. MAPEI MAPECURE SRA25), diluted every 25-30 m^2 and along the walls with 1 cm polyethylene foam strip
  - 1 rtg. 0,2 mm vtg. PE foil technological insulation with surface adhesive, folded along the edge insulation (e.g. MAPEI MAPEPLAN 020)
  - 3 cm EPS T5 crotch sound insulation board with offset laying (e.g. AUSTROTHERM AT-L5)
  - 3 cm EPS150 expanded polystyrene foam insulation (e.g. AUSTROTHERM AT-N150)
  - prefabricated reinforced concrete slab+ concrete slab - according to structural design

- **6. Relief under oil-immersed transformers (SU building):**
  - hot-dip galvanised basalt chips for walking chips
  - gravel
  - 1 rtg. lubricated oil-resistant insulation (e.g. XYPEX Modified)
  - 1 rtg. of the same system primer under field insulation (e.g. XYPEX Concentrate)
  - 25 cm monolithic reinforced concrete transformer designed as a base basin, sloped to the centre, connected to a low point observation shaft - according to structural design
  - 10 cm reinforced precast concrete - according to structural design
  - 15 cm sandy gravel soil improvement layer
  - cultivated soil up to the level of coarse landscaping or compacted backfill (stabilized soil backfill if necessary), with load bearing capacity according to foundation design - according to structural or civil engineering plans

The summary site plan attached in Annex 2.3 and the floor plans attached in Annex 2.4 show the areas with additional protection. The table below provides a justification per building and per site as to why additional protection (e.g. HDPE sheeting) is not required for a particular site, based on design data.

The planned layout of the access roads to the operational collection points (6) and waste storage areas is as follows:

- Plant assembly points I and II and VI and Storage 1 and 2 respectively:
  - 5 cm AC 11 kopó (F)
  - 5 cm AC 16 binder (F)
  - 15 cm CKt-4 cement stabilisation
  - 30 cm sandy gravel
- Plant collection points III and IV:
  - 16 cm CP4/2,7 concrete wearing course
  - 15 cm CKt-4 cement stabilisation
  - 20 cm granular frost protection/repair layer
- Plant collection point V:

- 16 cm CP4/2,7 concrete wearing course
- 15 cm CKt-4 cement stabilisation
- 2 rtg. 0,2 mm vtg. PE foil sliding layer (e.g. MAPEI MAPEPLAN 020), laid 20 cm overlapped, self-adhesive
- surface-continuous with tapes
- ~30-40 cm antifreeze crushed stone leachate layer according to static plans, including HDPE chemical resistant drainage pipes, which
- are led into a monitoring well
- 3 cm compacted sand filling
- 1 rtg. 1200 g/m^2 non-woven polypropylene geotextile protective layer (e.g. EDILFLOOR GEODREN PPST 1200)
- 1 rtg. 2,4 mm thick acid and alkali resistant HDPE waterproofing sheet (e.g. AGRU HDPE), waterproof welded
- surface leveled, up to 10 cm above the floor line
- 1 rtg. 1200 g/m^2 non-woven polypropylene geotextile backing layer (e.g. EDILFLOOR GEODREN PPST 1200)
- 3 cm compacted sand filling

Based on the data provided by the designers, the above-mentioned layering systems will comply with the requirements of the Government Decree 246/2014 (29.IX.), if properly maintained.

- In the case of an operational assembly point, the access road is planned to be uniform and continuous and to be paved with a watertight solid surface, in accordance with Article 14(3) of the Regulation.
- The road leading to the waste storage areas will be of a uniform and continuous design, as well as impermeable and solid surfacing, as specified in § 18(1).

Rainwater collection and drainage will be ensured. Leachate drainage is not required for access roads due to the enclosed storage.

13. Table 1: Main characteristics of the areas concerned by liquid storage

Building	Premises	Type of fluid	Located at	Design
EN	EL_A101 - Cathode mixer	NMP NMP based liquid (CNT) Slurry	NMP tank: double-walled, leak detection design CNT's own steel damage salvage will be placed in a salvage yard Mixing vessels double-walled, outer jacket water-filled Installation of increased performance seals required Liquid sealing at specified locations cuffs are placed	The floor is stainless steel plate The weld seam is liquid tight, 100% penetration testing is required, liquid sensors are placed into the room, which in the event of a spillage sound and light signals
	EL_A105.1 - Quality control 1	Slurry	Small amount of sample material (lab volume) Sample storage, storage of laboratory chemicals in your own safety cabinet	Stainless steel cladding
	EL_A105.2 - Quality control 1	Slurry	Small amount of sample material (lab volume) Sample storage, storage of laboratory chemicals in your own safety cabinet	Stainless steel cladding
	EL_A108 - Anode mixer	Slurry	Barrels of additives are placed in their own steel damage salvage in the salvage; Liquid feedstock tanks are of double-walled, leak detector design Mixing vessels double-walled, outer jacket water-filled Installation of increased performance seals required Liquid-tight cuffs are placed in specified locations	The floor is stainless steel plate The weld seam is liquid tight, 100% penetration testing is required, liquid sensors are placed in the room to give an audible and visual alarm in case of spillage

Building	Premises	Type of fluid	Located at	Design
	EL_A111.1 - Quality control 2	Small amount of sample material (lab volume) Sample storage, storage of laboratory chemicals in your own safety cabinet		Stainless steel cladding
	EL_A111.2 - Quality control 2	Small amount of sample material (lab volume) Sample storage, storage of laboratory chemicals in your own safety cabinet		Stainless steel cladding
	EL_A115 - Cathode coating applicator	Slurry storage stainless in steel tanks	Slurry tanks: double-walled, leak detection design	The floor is made of stainless steel sheet
	EL_A116 - Anode coating applicator	Slurry storage stainless in steel tanks	Installation of increased performance seals required	The weld seam is liquid-tight, 100% penetration testing is required, liquid sensors are placed in the room to give an audible and visual alarm in case of spillage
	EL_A121 - Cathode coating applicator	Slurry storage stainless in steel tanks	Liquid-tight cuffs are placed in specified locations	
	EL_A122 - Anode coating applicator	Slurry storage stainless in steel tanks		
	EL_A127_Cathode calendaring QC	Small amounts of liquid for cleaning purposes only - Quality control		Chemically resistant liquid tight, continuous epoxy cladding
	EL_A128_Anode calendaring QC	Small amounts of liquid for cleaning purposes only - Quality control		Chemically resistant liquid tight, continuous epoxy cladding
	EL_A201_Cathode powder dosage	Small amounts of liquid for cleaning purposes only		The floor is made of stainless steel sheet
		SBR/PAA water-based	Barrel additives for own steel are deposited in a salvage yard	The floor is stainless steel plate
			to the salvage yard; Liquid raw material tanks are of double-walled, leak detector design	

	EL_A203_Anode powder administration	suspension + cleaning small amount of liquid	Mixing vessels double-walled, outer jacket water-filled Installation of increased performance seals required Liquid sealing at specified locations cuffs are placed	The weld seam is liquid-tight, 100% penetration testing is required, liquid sensors are placed in the room to give an audible and visual alarm in case of spillage
Building	**Premises**	**Type of fluid**	**Located at**	**Design**
	EL_A207_Anode unpacker	SBR/PAA water-based suspension passive storage	passive storage	The floor is made of stainless steel sheet
	EL_B101_CNT warehouse	CNT NMP-s suspension passive storage	passive storage	Chemically resistant liquid tight, continuous epoxy cladding
	EL_B103-EL_B104_NMP buffer	Temporary storage of NMP	NMP is stored in stainless steel tanks	damage-resistant room, with HDPE film, chemically resistant liquid tight, continuous epoxy cladding
	EL_B114_Waste storage	CNT	liquid-based waste only are stored in a damage tray	Chemically resistant liquid tight, continuous epoxy cladding
	EL_B135_Ion-free water storage	Water treatment products	liquid-based waste only are stored in a damage tray	Chemically resistant liquid tight, continuous epoxy cladding
	EL_B141_Tool warehouse 6	Small amounts of liquid for cleaning purposes only		Chemically resistant liquid tight, continuous epoxy cladding
	AS_A136_Laser cutting and rolling workshop	Use of small amounts of liquid for cleaning purposes only		-
	AS_A138_Assembly room	Use of small amounts of liquid for cleaning purposes only		-
	AS_A138.1-5_Quality control room	Small amounts of liquid for cleaning purposes only		Chemically resistant liquid tight, continuous epoxy cladding
	AS_A141 - Quality control room 4	Small quantities of liquids for cleaning purposes only Small quantities of laboratory chemicals		Chemically resistant liquid tight, continuous epoxy cladding

AS	AS_A142 - Electrolyte Injection 1	Electrolyte injection, DMC, Electrolyte storage	The storage tanks and injection equipment with their own damage limiter with a capacity to hold the total storage volume	Chemically resistant liquid tight, continuous epoxy cladding
	AS_A144 - Quality control room 5	Small quantities of liquids for cleaning purposes only Small quantities of laboratory chemicals		Chemically resistant liquid tight, continuous epoxy cladding
	AS_A145 - Electrolyte Injection 2	Electrolyte Injection, DMC, Electrolyte storage	The storage tanks and injection equipment with their own damage limiter with a capacity to hold the total storage volume	Chemically resistant liquid tight, continuous epoxy cladding
	AS_A146 - Quality control room 6	Small quantities of liquids for cleaning purposes only Small quantities of laboratory chemicals		Chemically resistant liquid tight, continuous epoxy cladding
Building	**Premises**	**Type of fluid**	**Located at**	**Design**
	AS_A148 - Electrolyte Injection 3	Electrolyte injection, DMC, Electrolyte storage	The storage tanks and injection equipment with their own damage limiter which has the entire storage capable of absorbing volume	Chemically resistant liquid tight, continuous epoxy cladding
	AS_A150.1-3 - Soldering and riveting	Battery		Chemically resistant liquid tight, continuous epoxy cladding
	AS_B129 - Electrolyte transfer	Electrolyte	damage-resistant room with HDPE film, chemically resistant liquid barrier, continuous epoxy cladding	damage-resistant room, with HDPE film, chemically resistant, liquid-tight, continuous, non-sparking, conductive epoxy coating
	AS_B132 - Battery disconnection room	Small quantities of liquids for cleaning purposes only Small quantities of laboratory chemicals		Chemically resistant liquid tight, continuous epoxy cladding
	AS_B168 - Tool warehouse 8	Small quantities of liquids for cleaning purposes only Small quantities of laboratory chemicals		Chemically resistant liquid tight, continuous epoxy cladding
	FO_A101_RT Agitator 1-1	Battery storage	Batteries are delivered on a tray for storage	Chemically resistant liquid tight, continuous epoxy cladding
	FO_A102_Degasifier 1-1	Battery storage	The degassing equipment has its own damage limiter	Chemically resistant liquid tight, continuous epoxy cladding

FO	FO_A103_Drill welder 1-1	Battery storage Small amounts for cleaning purposes only fluid	The batteries are stored on a tray	Chemically resistant liquid tight, continuous epoxy cladding
	FO_A106_ HT Agitator 1-1	Battery storage	The batteries are stored on a tray	Chemically resistant liquid tight, continuous epoxy cladding
	FO_A107_RT Agitator 1-2	Battery storage	The batteries are stored on a tray	Chemically resistant liquid tight, continuous epoxy cladding
	FO_A108_Classifier 1-1	Battery storage	The batteries are stored on a tray	Chemically resistant liquid tight, continuous epoxy cladding
	FO_A109_RT Agitator 2-1	Battery storage	The batteries are stored on a tray	Chemically resistant liquid tight, continuous epoxy cladding
	FO_A110_Degasifier 2-1	Battery storage	The batteries are stored on a tray	Chemically resistant liquid tight, continuous epoxy cladding
Building	**Premises**	**Type of fluid**	**Located at**	**Design**
	FO_A112_Drill welder 2-1	Battery storage	The batteries are stored on a tray	Chemically resistant liquid tight, continuous epoxy cladding
	FO_A113_Mass spectrometry room 2-1	Battery storage Small amounts for cleaning purposes only fluid	The batteries are stored on a tray	Chemically resistant liquid tight, continuous epoxy cladding
	FO_A114_ HT Stirrer 2-1	Battery storage	The batteries are stored on a tray	Chemically resistant liquid tight, continuous epoxy cladding
	FO_A115_RT Stirrer 2-2	Battery storage	The batteries are stored on a tray	Chemically resistant liquid tight, continuous epoxy cladding
	FO_A116_Classifier 2-1	Battery storage	The batteries are stored on a tray	Chemically resistant liquid tight, continuous epoxy cladding
	FO_A117_RT Stirrer 3-1	Battery storage	The batteries are stored on a tray	Chemically resistant liquid tight, continuous epoxy cladding
	FO_A118_Degasifier 3-1	Battery storage	The degassing equipment has its own damage limiter	Chemically resistant liquid tight, continuous epoxy cladding

	FO_A120_Drill welder 3-1	Battery storage	The batteries are stored on a tray	Chemically resistant liquid tight, continuous epoxy cladding
	FO_A121_Mass spectrometry room 3-1	Battery storage Cleaning only small amounts of liquid for	The batteries are stored on a tray	Chemically resistant liquid tight, continuous epoxy cladding
	FO_A122_ HT Stirrer 3-1	Battery storage	The batteries are stored on a tray	Chemically resistant liquid tight, continuous epoxy cladding
	FO_A123_RT Stirrer 3-2	Battery storage	The batteries are stored on a tray	Chemically resistant liquid tight, continuous epoxy cladding
	FO_A124_Classifier 3-1	Battery storage	The batteries are stored on a tray	Chemically resistant liquid tight, continuous epoxy cladding
	FO_B109_Quality control	Battery test	The batteries are stored on a tray	Chemically resistant liquid tight, continuous epoxy cladding
	FO_B126_Tool warehouse 4	Small amounts of liquid for cleaning purposes only		Chemically resistant liquid tight, continuous epoxy cladding
Building	**Premises**	**Type of fluid**	**Located at**	**Design**
	FO_A201_OCV and bowl cleaning	Battery test	The batteries are stored on a tray	Chemically resistant liquid tight, continuous epoxy cladding
	FO_A202_OCV and bowl cleaning	Battery test	The batteries are stored on a tray	Chemically resistant liquid tight, continuous epoxy cladding
	FO_A203_OCV and bowl cleaning	Battery test	The batteries are stored on a tray	Chemically resistant liquid tight, continuous epoxy cladding
	FO_B408_Space	Small amounts of liquid for cleaning purposes only		Chemically resistant liquid tight, continuous epoxy cladding
	SO_A101.1-2_OCV 4	Battery test		
	SO_A102_ Storage of semi-finished products	Battery storage		
	SO_A103_ Storage of semi-finished products	Battery storage		

SO	SO_A104_ Storage of semi-finished products	Battery storage	Only finished batteries are installed, no liquid leakage presumably	Chemical resistant and liquid barrier resin cover
	SO_A105_ Storage of semi-finished products	Battery storage		
	SO_A106_ Storage of semi-finished products	Battery storage		
	SO_A107_ Storage of semi-finished products	Battery storage		
	SO_A108_ Storage of semi-finished products	Battery storage		
	SO_A109_ Finished product storage	Battery storage		
	SO_A110_Sorting table	Battery storage		
	SO_B108_Offline CT	Battery test		
RM	RM_A102_Nyersmaterial warehouse	Raw material storage	Passive storage	Chemically resistant liquid tight, continuous epoxy cladding
	RM Laboratory room	Small quantities of liquids for cleaning purposes only Small quantities of laboratory chemicals Small quantities of raw material samples		Chemically resistant liquid tight, continuous epoxy cladding
Buildin g	**Premises**	**Type of fluid**	**Located at**	**Design**
	RM_A303_Tool storage	Storage of small quantities of laboratory chemicals		Chemically resistant liquid tight, continuous epoxy cladding
MU	MU_B114, B116, B117, B124-B128 Facility fire station, laundry room and warehouses	hazardous substances used to extinguish fires in small quantities	in the assembly and associated maintenance and cleaning premises	Chemically resistant liquid tight, continuous epoxy cladding
	MU_B306_Sanitary laboratory	Battery test	Ready sealed batteries are tested	Chemically resistant liquid tight, continuous epoxy cladding

	MU_B307_Mint Manager	Battery storage	Small amounts of liquid for cleaning purposes only	Chemically resistant liquid tight, continuous epoxy cladding
	MU_B322-B323_Ciklusteszt room	Battery test	Ready sealed batteries are tested	Chemically resistant liquid tight, continuous epoxy cladding
PS	PS_A101.1_Room	Heat transfer oil	Damage flumes will be installed around boilers	Chemically resistant liquid-tight, continuous epoxy, non-sparking, conductive coating
	PS_A103_Oil tank	Heat transfer oil	The oil tanks have their own steel buffer have	Chemically resistant liquid tight, continuous epoxy cladding
	PS_A104_1-2_Szilard waste storage	RO filter	Waste containing liquids may only be disposed of on a salvage yard	Chemically resistant liquid tight, continuous epoxy cladding
	PS_A105, B109-B111 Waste water treatment centre and ancillary facilities	Waste water and chemicals used for waste water treatment	Treatment vats, collection containers (sewage sludge) or or other closed containers (used chemicals)	chemically resistant, liquid tight, continuous epoxy cladding
				HDPE film
				waste water treatment basins and tanks design with special glass fabric lining
	PS_A203_Purified water storage	water treatment chemicals	floor drain connected to the wastewater treatment plant	chemically resistant, liquid tight, continuous epoxy cladding
	PS_A214_Chiller room	Glikol	floor drain connected to the wastewater treatment plant	chemically resistant, liquid tight, continuous epoxy cladding
SU	Outdoor 132/11 kV transformers	transformer oil	Transformer base designed as a basin	Hot-dip galvanized walking beam elements are placed under transformers, basalt chips are used to cool spillage oil they carry. Underneath the pavement (with gravel
Building	**Premises**	**Type of fluid**	**Located at**	**Design**
				backfilled) reinforced concrete pool decks with XYPEX lubricated oil-resistant insulation are treated. The basin sections in the middle sloped down. At the deepest point, a 50 mm diameter KG-PVC pipe leads to the

				observatory in mines.

4.14.2. From possibly environmental impact causing environmental damage Accidents, malfunctions, the resulting impact factors

For detailed information on potential accidents in industrial technology and how to protect against them, see subsections 4.3 and 4.4 (Emergency management). In general, in all premises where the storage or use of hazardous substances in liquid form is planned, a covering resistant to the chemical properties of the substances stored will be provided (, where appropriate, HDPE sheeting and a monitoring leakage layer). Floor drains connected to a public sewer will not be installed in the process rooms. Automatic fire thresholds will be installed on the external facades of the buildings to prevent the escape of extinguishing agents into the environment. Discharge areas associated with the NMP and electrolyte tank farms will be of a damage containment design with adequate capacity slop tanks. Given that all loading is planned to be dock-connected, forklift or automatic loader, the possibility of other contaminants escaping to the outer envelope is unlikely, subject to technical discipline. The collection of stormwater run-off from the site is planned to be in a closed collection system. In view of the above, the release of pollutants to groundwater, groundwater and the geological medium is unlikely. An exception to this is the possibility of a road accident within the site, for which a maximum speed of 10 km/h is recommended. There is also a risk from the transport of hazardous waste to the DW building and hazardous substances from the DW building to the RM building, which should be prevented by the use of appropriate containers and packaging and by respecting the speed limit mentioned above. The automatic material handling systems to be used will be equipped with proximity and obstacle detection sensors, so that no accidental material spillage is likely to occur during the transport of materials by the automatic systems.

In the areas with higher volume liquid storage or use, it is planned to install liquid sensors on the floor, which will be connected to the BMS system, providing an immediate signal (sound/light) in case of leakage or liquid spillage. In addition, the signal transmitted by the sensors will control automatic valves via the BMS system to automatically shut off the lines and prevent further spillage. The rooms for the storage/use of hazardous liquids will be equipped with a full-coverage solvent vapour detection system (ppm or LEL), which will immediately detect any leakage of liquid and allow local signalling and immediate intervention. All safety signals (fire alarm, liquid sensor, solvent vapour sensor, etc.) and process operating signals will be connected to the central BMS system. The BMS system combines the incoming signals and implements automatic signals and interventions.

The prevention of accidental or fugitive emissions of air pollutants from the process is achieved by the use of direct extraction systems covering the entire working area, or designed for the specific process step, and high-efficiency dust collection systems in the process areas where the air is recirculated. As in the subsections 4.3 and 4.4, the filters of the air pollution control point sources are designed to be installed redundantly, so that no change in the emission concentration of pollutants or fugitive emissions can be assumed to occur during filter replacement. Differential pressure sensors will be installed on the dust collectors to detect clogging of the filter fabric and provide a central signal for technology about the need for filter replacement or malfunction. The technology is automatically shut down if the filters do not function properly (e.g. filter fabric tears, etc.). The filters have a built-in flushing system and a post-cleaning function. All exhausts are redundant, so that in the event of a failure, the airflow is automatically diverted to the redundant side.

The emergency ventilation of areas affected by a potential accident will also be routed to isolation equipment, so no emissions above the limit value are expected in the event of an accident.

As described in chapter 4.14, the raw materials and auxiliary materials supplied are stored in sealed packaging until use. The supply of the technology with basic and auxiliary materials is planned in a closed system or in closed rooms with adequate extraction and containment, so that fugitive emissions associated with the manipulation of the materials are unlikely.

The facility will a dual electricity feed-in, so that it will be linked to power outages.
accidents and spills are .

However, the risk of accidents related to fires should be highlighted in relation to the establishment. The batteries to be manufactured will be charged and discharged several times as part of the manufacturing process and subsequent testing. During these activities, in the case of defective batteries, a so-called thermal runaway[1] cannot be excluded, which may result in an increase of the internal temperature of the and its subsequent ignition. Such an event can occur during the forming process and subsequent manufacturing and testing steps. Automatic quenching equipment and automatic robotic technology are planned to be used during the forming process. The system monitors data from temperature sensors and, in the event of an undue change in temperature, the robots automatically remove the battery trays from the forming bins and place them in the dip trays available on the premises. The cabinets are also equipped with a fire extinguishing system, with additional fire water collection trays under each tray. In the other process areas, in addition to the built-in extinguishing systems, adequate extinguishing is ensured in part by automatic extinguishing systems built into the process equipment. In addition to the automatic extinguishing system, the above-mentioned submersion basin will be available in the BS and BD buildings to deal with any fires that may occur during the dismantling of the failed batteries. As mentioned above, the release of fire-fighting foam into the environment will be prevented by the use of appropriate layering or damage containment in interior spaces and emergency mobile thresholds in rooms with doors to the outside. In water extinguished spaces, containment is achieved in the same way, except in rooms with doors to the outside, where contaminated fire water may be discharged to external finishes outside the building. In this case, the facility fire department planned to be voluntarily operated on the premises by the Permittee shall be responsible for protecting storm drain garbage and collecting contaminated fire water. To minimize the contamination of stormwater runoff accumulating within the premises, automatic interlocks activated by a signal from the fire protection system or self-inflating balloons may be installed in the storm drain system to automatically close the storm drain section. Given that the collection of stormwater is designed as a closed system and only discharged after testing, any contamination of the collected stormwater should not cause the

[1] Heat run-up is a general term for a process where a rise in temperature changes conditions in such a way as to cause a steady further rise in temperature. In the context of lithium-ion batteries, thermal runaway can occur when the battery is overcharged, overheated or physically damaged.

off-site pollution of the stormwater network. In order to prevent contamination of the stormwater network, firefighters will fence off the area affected by the intervention and seal off the drainage pipes in the area with drain covers. After the intervention, the contaminated water will be pumped into IBCs or sludge tanks in the area. Further actions will be specified based on the assessment of the conditions on site (e.g. soil replacement, disconnection and cleaning of the stormwater network, etc.).

As mentioned above, the for accidents and breakdowns that could cause environmental pollution is very low. As summarised above, the escape of pollutants from buildings and on-site tank farms is unlikely, except for the escape of contaminated fuel water from the building. The contaminated fuel water can be collected on the paved surface or, if discharged to a closed stormwater system to be constructed within the site, treated without contaminating the external environment.

There is a potential risk of contaminant spillage onto the pavement during the use of the discharge areas, but the potential for significant contamination from electrolyte or NMP discharge is also unlikely as described below:

- The new NMP is delivered to the plant by road. During delivery, the transport vehicle drives to the unloading station where the new NMP is pumped into one of the new NMP storage tanks.
- The contaminated NMP is transported from the plant by road. During the delivery, the transport vehicle drives to the unloading station where the contaminated NMP is transferred from the contaminated NMP storage tanks to the ISO tanker truck by means of pumps.
- Hazardous liquid containers are located within a containment building, adjacent to which is a discharge area. A steel frame roof structure will be constructed over the entire discharge area to minimise the amount of stormwater entering the areas. The stormwater run-off and, in the event of a disaster, the contaminated liquid from both the remediation and the discharge areas will be discharged into a 40 m^3 underground sludge tank. The discharge area is connected to the slop tank by a gravity underground pipeline, so that the area is automatically drained without external intervention. The underground pipeline a double-walled stainless steel pipeline with a glycol interspace and a leak detection system to prevent soil contamination. The 40 m^3 column tank will be located in the southern part of the remediation. The tank is double-walled and equipped with a leak detection instrument according to MSZ 9910-3 3.3.7, so it will be installed without a containment area. The interstitial space of the slop tank will be filled with antifreeze and a leak detector will be installed to monitor the double wall and alert the operator in case of leakage.
- The inner surface of the walls and flooring of the damage shelter will be waterproof and designed to withstand the chemical properties of the stored material (NMP). HDPE sheeting bonded to the monitoring well will be installed under the entire containment and discharge area. Along the perimeter of the discharge area, a river will be constructed and discharged into a sump, from which any contaminated liquid will be gravity drained to the slop tank via an underground double-walled stainless steel pipeline as described above.
- In the event of leaks or breaks in the connections, the transfer pumps will automatically stop in response to a signal from the built-in sensors
- In addition, a work instruction will be drawn up for the unloading operation, according to which the unloading must always be carried out by two people, one of whom will be responsible for the emergency stop only, while the

the other is responsible for monitoring the unloading. Leaks are therefore immediately detected and the pumps can be stopped.

On the basis of the above, in the event of an accident, the actual amount of pollutant released could be spread over an area of a few m^2 in the vicinity of the discharge stub, where it would not cause groundwater or geological contamination, taking into account the multiple protection systems mentioned above.

The discharge of this amount of pollutant, given that the collection of the pollutant by the operator staff will commence immediately after discharge, and will be completed by the facility fire department arriving on site shortly the failure report, is not expected to result in significant air pollutant loading at the NMP. In the case of electrolyte, because its constituents are more susceptible to evaporation (higher vapour pressure of constituents than NMP), the air pollution impact will be elevated for a short period of time in the environment following the release of the pollutant. Considering that the immediate intervention of the operating personnel and the decontamination activities of the plant fire brigade can be considered as a factor for load reduction, the area affected by the increase in pollutant concentration is not expected to extend beyond the boundaries of the plant.

This conclusion is supported by the results of the disaster management modelling carried out for the facility, which covered the following potential events:

- Electrolyte tank farm - tank damage
- Discharge of electrolyte tanker - Pond fouling that can be calculated in the event of damage to the tanker
- NMP tank farm - tank damage
- NMP Tanker Discharge - Calculated ponding in the event of an NMP puddle in the event of tanker damage
- Truck transporting finished batteries - unforeseen fire hazard caused by batteries transported on a truck
- Damage to natural gas pipeline at PS building
- Gas receiving station - natural gas pipeline rupture at gas receiving station
- DW warehouse - Assessment of the fire risk of various flammable liquids in the DW warehouse
- RM building - warehouse fire
- EL building - "warehouse" fire

Taking into account the results of the calculation carried out for the above events, none of the potential accidents at the installation will have an impact on inhabited areas. Based on the calculation results, an internal domino effect can be excluded. The tanks in the NMP and electrolyte tank farm are located in a separate fire compartment. In the event of a ponding fire resulting from damage to one tank, the other tanks in the tank farm could also be damaged. However, this has been taken into account in the frequency calculation. The detailed calculation results are attached in Annex 1.24.

4.14.3. Description of potential external triggers and their resulting impact factors, independent of the activity of the environmental user

The BMW facility currently under construction is located in the immediate vicinity of the planning area. According to information provided by the relevant emergency management directorate, the BMW site is licensed as a hazardous establishment below the threshold. Based on experience with similar installations, the potential presence of substances (paints and solvents, oils, potentially flammable refrigerants) may present an environmental or fire and explosion risk, but, assuming adequate technical protection is in place, a significant disaster risk is unlikely. The BMW industrial safety protection zone does not extend beyond the site boundary.

At a greater distance, after consultation with the disaster control authority and taking into account the regulatory plan, there are other high-risk facilities with disaster control permits, but the boundaries of their protection areas are located at a considerable distance from the proposed facility, so that no external industrial triggers are identified on the basis of the available information. The occurrence of accidents due to environmental disasters is unlikely, as indicated in section 5.5.3.

4.14.4. Demonstration of the extent of the risk of accidents and breakdowns, with particular regard to the materials used and the technology employed

As discussed in Section 4.14.2, taking into account the planned protection measures, no accidental or malfunctional releases are likely to occur under normal operating conditions, assuming technical discipline is maintained.

Assuming the occurrence of a hazard event, the release of hazardous liquids (NMP and electrolyte) in higher quantities as indicated in Table 3 and the release of wastes in higher quantities as described in Section 7.4.2 can be assumed. However, given that both NMP and electrolyte are stored and used in a closed system and that the materials (NMP, waste NMP, electrolyte) are discharged from the tanks in a discharge area with a HDPE sheeting with a baffle, it is unlikely that contaminants will be released to groundwater or the geological environment. Care should be taken when moving waste around the site to reduce the risk of contaminants escaping.

4.15. A for this activity required load- and passenger transport the volume and the transport requirements

4.15.1. Construction period

The expected traffic increases during the construction period have been determined by taking into account the Investor's data.

The total expected quantities of materials in the larger volumes for the proposed development are given below.

The construction of the buildings and the preparation of the base course therefore generates lorry traffic during construction. The simultaneous occurrence of these processes cannot be ruled out given the scale of the project, so we have based our calculations on the maximum possible traffic load, as follows.

The expected increase in traffic related to the supply of **concrete:**

- 10,000 m^3/ 8 m^3 / 300 days / 12 hours = 0.5 tgk/hour, which double on the roads concerned, so the expected load is 1 tgk/hour and 12 tgk/day.

The expected increase in traffic is related to the supply of **precast concrete elements:**

- 108,904 m^3/ 20 m^3 / 300 days / 12 hours = 1.75 tgk/hour, which is double on the roads concerned, so the expected load is 3.5 tgk/hour and 42 tgk/day.

The expected increase in traffic related to the supply of **gravel:**

- 5,000 m^3/ 12 m^3 / 300 days / 12 hours= 0.25 tgk/hour, which doubled on the roads concerned, so the expected load is 0.5 tgk/hour and 6 tgk/day.

The expected increase in traffic related to the supply of **asphalt:**

- 15,000 m^3/ 8 m^3 / 300 days / 12 hours= 0.75 tgk/hour, which doubled on the roads concerned, so the expected load is 1.5 tgk/hour and 18 tgk/day.

The expected increase in turnover related to the supply of **steel:**

- 8 000 t/ 20 t / 300 days / 12 hours = 0.25 tgk/hour, which is doubled on the roads concerned, so the expected load is 0.5 tgk/hour and 6 tgk/day.

The expected increase in traffic related to the supply of **cement:**

- 2 000 t/ 20 t / 300 days / 12 hours = 0.25 tgk/hour, which is doubled on the roads concerned, so the expected load is 0.5 tgk/hour and 6 tgk/day.

The expected increase in traffic related to the supply of **stabilising material:**

- 14,376 m^3/ 12 m^3 / 150 days / 12 hours = 0.75 tgk/hour, which is double on the roads concerned, so the expected load is 1.5 tgk/hour and 18 tgk/day.

The expected increase in traffic related to the supply of **rebar:**

- 8 000 t/ 20 t / 300 days / 12 hours = 0.25 tgk/hour, which is doubled on the roads concerned, so the expected load is 0.5 tgk/hour and 6 tgk/day

The **prefabricated columns, beams, elements and slab slabs** must be delivered to the site by semi-trailers. One or two of these elements can be placed on a single assembly, either because of their weight or their dimensions. Based on grid layout of 12x12 m, 144 m^2 are delimited by 4 piers each, 2 beams, to which are added the small additional elements to be installed.

140 036 m^2 / 144 m^2= cca 1000 pillars and 2000 elements, beams, additional 1000 small elements.

- 1000 pillars / 1 piece / tgk= 1000 tgk,
- 2000 batteries / 2pcs / car= 1000 pcs,
- 1000 batteries / 4 pcs / battery = 250 pcs.

A total of 2250 trailers in 180 days.

- 2250 tgk / 180 days / 12 hours= 1.25 tgk/hour, which double for the section concerned, i.e. expected load 2.5 tgk/hour x 12 hours= 30 tgk/day.

Total 210 000 m^2 wall element supply. Average saddle loading area 2.4 m wide, 13.6 m long, 2.0 m high. Based on this, 1 saddle can accommodate 2.4 x 13.5 x 10 rows of panels (0.2 thick wall panels), which is roughly 300 m^2 panels per tgk.

- 210,000 m^2 / 300 m^2/tgk= can be carried by 700 trailers, which, calculated over 100 days of construction time, is an additional 700 trailers / 100 days = 7 tgk/day, which is doubled on the section concerned, i.e. 14 tgk/day.

The expected increase in turnover related to the supply of **flooring elements:**

- 550 m^3 / 10 m^3 / 100 days / 12 hours = 0.25 tgk/hour, which is doubled on the roads concerned, so the expected load is 0.5 tgk/hour and 6 tgk/day

The expected increase in traffic related to the supply of **pipes and cables**:

- 597.3 km / 12 km / 100 days / 12 hours = 0.25 tgk/hour, which is doubled on the roads concerned, so the expected load is 0.5 tgk/hour and 6 tgk/day.

The expected increase in traffic due to the supply of **other elements to be installed** (doors, windows, lighting, etc.):

- 200 tgk / 50 days= 4 tgk/day, which doubled on the section concerned, so the expected load 8 tgk/day.

During construction, assuming a worst case scenario, the various construction materials are expected to be delivered in parallel, so the cumulative maximum load occurring at the same time as described above is assumed to be the maximum lorry/day for the proposed development in subsequent calculations:

- 178 tgk/day

During the construction period, special attention should be paid to the continuous cleaning of the roads of any mud accumulation caused by transport vehicles, to reduce the subsequent diffuse dust pollution and to avoid the risk of accidents.

4.15.2. Operation during

Taking into account the maximum capacity during the operation of the facility, the following traffic is expected at each time of day.

14. Table 1 Breakdown of additional traffic generated by the installation

	Time of day	Hourly peak	Total
Passenger car	06:00-14:00	170	468
	14:00-22:00	170	468
	22:00-06:00	170	340
Solo bus	06:00-14:00	7	14
	14:00-22:00	7	14
	22:00-06:00	5	10
Lorry	06:00-14:00	11	88
	14:00-22:00	11	88
	22:00-06:00	-	-

During the period of operation, the Investor will transport the finished product to the BMW car factory located on the opposite side of BMW Boulevard in the amount of 20 tgk/day (double this amount due to the return traffic). This stock will be used exclusively on the northern section of BMW Boulevard. The remaining freight traffic will access the facility from the M35 motorway. It is expected that the passenger car and bus traffic generated during the operational period will be distributed between the different directions. The estimated distribution of traffic generated is detailed in section 5.11.2.

4.16. Related operations for installation, implementation, abandonment

The DMJV is responsible for the implementation of road and utility improvements in the planning area and its immediate vicinity, and therefore the development does not require related operations.

The electricity supply of the installation will be ensured by the connection to the 132/22 kV Debrecen Macs 132/22 kV substation operated by OPUS-TITÁSZ, as described in chapter 4.8. The connection of the two substations will require the construction of an underground cable network to connect the Debrecen Macs 132/22 kV substation to the Debrecen Eve 132/11 kV transformer substation, to be designed and constructed by the investor. The underground cable for the connection will be owned and operated by OPUS-TITÁSZ after the construction. The development is the responsibility of the Contracting Authority. The assessment of the impact of the off-site infrastructure works was carried out in the preliminary study on the establishment and provision of infrastructure for the Debrecen North-West Economic Belt, which was concluded by the decision HB-03/KTF/00117- 2/2019.

The Permittee does not plan to continue the installation of a trail beyond the planning area after the development is completed. Based on the above, there are no plans to construct any trail facility as part of the implementation of the development that would be the responsibility of the Permittee and its environmental impacts have not been previously investigated and evaluated or as part of this permit application.

The construction of the planned facility does not require any other operations during the constructionoperation or decommissioning phases.

There are no plans to close down the facility or cease operations in the near future. Future planned remediation will involve the demolition of buildings and pavement, utilities and other underground infrastructure. Construction noise and air pollution are expected during demolition activities. Large quantities of demolition waste are expected to be generated during demolition, but most of this is expected to be recycled. In order to avoid environmental pollution, the utilities and tanks will be drained and, if necessary, the sections of the utilities will be plugged before the demolition work starts.

No noise impacts beyond the noise impacts of construction activities are expected during the decommissioning of the installation. The nature of the pavement design is such that it is unlikely to cause significant pollution in the area.

Once the entire facility has been demolished, the site must be restored. However, given that the facility will be located in an industrial park, the only challenge will be to prevent the future proliferation of invasive plant species.

4.16.1. Establishment and operation of a mine, target extraction site or disposal site opened as a result of the installation, landscaping or excavation of the bed required for the installation

The project does not require the establishment of a mine or landfill.

The necessary raw materials can be obtained from the construction facilities currently in operation. There is no waste on the site and no material is expected to be removed from the site, given that the site preparation works are being carried out under the permits referred to in Chapter 0, during which humus extraction has taken place. The materials and construction materials to be supplied are specified in detail in Chapter 4.15.1.

The proposed investment does not require the implementation of a dredging operation.

4.16.2. Transport, storage, warehousing, water management for installation and implementation

The transport capacities required for installation are given in chapter 4.15.1.

The preliminary plan is to carry out the installation on a tight schedule, so no major storage is planned and no storage will be required during construction. No dewatering will be required in connection with the installation.

4.16.3. Waste management and waste water treatment during implementation

Waste water is expected to be generated in the planning area during the construction period, i.e. during the implementation of the facility, due to the presence of workers. The municipal waste water generated will initially be collected by mobile or installed tank toilets, and the contents will be regularly removed for disposal.

For a detailed description of the waste generated during construction, see chapter 7.4.1.

4.16.4. The energy and water supply, if the own energy supply or is done by water extraction

The heating demand and the production of hot water for domestic use is planned to be supplied from the steam system, the waste heat from the condensate water from the steam system and the waste heat from the compressed air and nitrogen supply system, so no additional combustion plant is required. In the EM and LM port function buildings, split-system cooling/heating split units provide winter heating and summer cooling. No private wells are planned for the site.

In the surroundings of the planning area, under the road 0237/395, there is an existing drinking water pipeline D225KPE, operated by the Debreceni Waterworks. This pipeline will be used by the Municipality of Debrecen (DMJV) to provide the final drinking water supply to the site from road 0237/400, passing through plot 0237/398.

Separate on-site grey and dilution water supply networks will be required between the connection points and the water treatment plant to meet process water needs. These networks must be capable of receiving the long-distance grey and dilution water networks built by the City of Debrecen (DMJV), and to use. Industrial dilution water connection point: from road 0237/406, on the west side of the site. Industrial grey water access point: from road 0237/406, on the west side of the site.

The connection points are shown on the attached site plan 2.10.

A separate grey water and a separate dilution water network will be installed in the planning area and in public areas outside the planning area. Within the planning area, pre-treatment is required and only then will it be used for operational purposes.

The installation of a solar system is planned for the area as described in chapter 4.13.

During the design of the facility, the use of a hybrid cooling tower was investigated as an alternative to an open cooling tower. The hybrid cooling tower can operate without water consumption until the external temperature set by the manufacturer is reached, and then provide additional cooling capacity by evaporation, as in open cooling towers, to increase the cooling capacity. Based on the results of the test, the following can be highlighted:

- The open cooling tower
    - water demand is almost continuous, less dependent on external temperature
    - the peak water consumption is about 160 m^3/h
    - The water the cooling tower, which enters due to circulation and evaporation (blowdown water), the quality and quantity of waste water is almost the same throughout the year
    - Electricity demand ~500 kW
    - Lower noise emissions thanks to the noise-damped design
- The hybrid cooling tower:
    - Its water demand peaks depending on the outside temperature.
    - Compared to an open cooling tower, the consumption in the slide tower is about 4 times higher (~660 m^3/h)
    - The quantity and quality of blowdown water ranges between extreme limits, for which sewer capacity is difficult to scale
    - Electricity demand is about 10 times higher (~5240 kW)
    - Noise emissions are significantly higher.

Averaged over 5 years (taking into account outdoor temperatures), the annual water consumption of a hybrid cooling tower is ~30-40% of the annual water consumption of an open cooling tower, but the peak load is three times higher for a hybrid cooling tower.

The widely varying water demand of the hybrid cooling system could result in stagnant water conditions in both the pre-site boundary supply system and the internal supply and storage system, which would require the use of large amounts of additional chemicals to reduce health risks. Significantly higher electricity demand would place additional strain on the electricity grid.

Overall, taking into account that the cooling towers are designed to be supplied with grey water, there is no technical justification for a switch to a hybrid cooling tower. From a technical, environmental and health point of view, the open cooling tower to be used is preferable.

5. Baseline status of the planning area and its surroundings

5.1. Presentation of the urban environment

The planning area is located in the north-western part of Debrecen, in the North-Western Economic Belt. In the immediate vicinity of the planning area, there are accordingly industrial, economic and agricultural areas, as well as roads and commercial and service areas. In the wider area there are residential areas.

<u>The wider and narrower environment of the facility can be described as follows:</u>

- Agricultural land to the north;
- To the E, there are general economic areas for industrial activity, the North-West Economic Belt supplier park and the M35 motorway;
- To the D, the BMW investment area, agricultural land, a railway terminal and residential area
- In a westerly direction there is agricultural land, followed by residential

areas. The nearest dwellings to the site are summarised below:

- In a northerly direction, 8.06 km from the site boundary, there are residential buildings in Hajdúböszörmény, Bíró Lajos Street.
- In west-north-west direction, at a distance of 11.06 km from the site boundary, there are residential buildings in Újvilág Street, Balmazújváros.
- In a westerly direction, at a distance of 1,71 km from the site boundary, there are residential buildings of Debrecen-Nagymacs, Nagyhát street.
- In a south-westerly direction, at a distance of 3.04 km from the site boundary, are the residential buildings of Debrecen-Péterfiadűlő, Puli utca.
- In a south-easterly direction, the residential buildings of the Debrecen-Kismacs district are located at a minimum distance of 2,81 km from the site boundary.
- In a north-easterly direction, at a distance of 1,49 km from the site boundary, there are residential buildings in Debrecen-Józsa, Elek street.
- In an easterly direction, at a minimum distance of 1.63 km from the site boundary, there is the property parcel 0237/258 (Ágnes farm).

Based on the above list, the minimum distance from the site boundary of the installation to the nearest object to be protected is
can be marked at 1.49 km.

5.2. Topography conditions

The small area, with an altitude of 97.9-179.3 m a.s.l., is a wind-blown sand-covered alluvial conglomerate. The northern part of its surface is a medium-altitude dissected plain with a relative relief above 8 m/km^2, the southern part is a less vertically dissected (relative relief 5-8 m/km^2) and more horizontally dissected undulating plain. The surface is dissected by valleys with a NE-DNW dip. The slope direction is D-DNW. In the northern part of the small area, wind scarps and small deflation depressions have developed in a wide band, while in the southern part large parabolic and marginal humps (sometimes 2 km long and 15-18 m high) are typical. The moderate risk of deflation is a limiting factor for agricultural production.

5.3. Climate, Meteorology

Moderately warm, dry, but moderately dry on K. The area enjoys about 1950-2000 hours of sunshine per year, of which about 800 hours in summer and 170-175 hours in winter. The annual mean temperature is 9.6-9.8 °C (10.0 °C in D), the summer half-year 16.7-17.1 °C. The number of days with a mean temperature above 10 °C is 95-197, with the spring crossing days being 3-6 April and the autumn cut-off day 18-19 October.. and 19-21 Oct), but 190-192 days in the West (10 Apr to 19-21 Oct).

The average annual absolute maximum temperature is 34.0 °C, with a minimum of -18.0 °C on the K, but only around -17.0 °C on the W. The spatial distribution of precipitation is very variable. The annual precipitation totals range from 550 to 580 mm, but slightly exceed 590 mm in the K areas, while in the NW it is only around 550 mm. During the growing season, 340-350 mm of rain is likely. Most precipitation in one day was recorded in Debrecen (104 mm). In the winter half-year, 40-42 snow-covered days are expected, with an average maximum snow thickness of 18 cm.

The aridity index is 1.24-1.28, and 1.16-1.18 in E. The prevailing wind direction is NE. In 2nd and 3rd place in the frequency ranking, the winds from N and S are almost equal. The average wind speed is slightly below 3 m/s. Precipitation is scarce in some areas and its distribution is erratic. This mainly determines the crop varieties suitable for cultivation.

5.4. Air quality protection

To present the baseline air quality status of the City of Debrecen, we used the "Air Quality Plan for the Improvement of Air Pollution in the Area of the Debrecen Neighbourhood Zone Group", prepared in November 2020 by the Department of Environment and Nature Protection of the Hajdú- Bihar County Government Office.

According to the Air Quality Plan, the following causes are responsible for air pollution in Debrecen:

5.4.1. Transport

The population growth of the municipalities in the agglomeration of Debrecen is driving extra traffic onto the city's access and internal roads, and the number of cars in Debrecen has increased by 19% in 2019 compared to 2010. The increase in traffic has resulted in a significant load of traffic-related pollutants (ozone, nitrogen oxides) along the roads.

5.4.2. Residential heating

The proportion of gas-fired appliances in Debrecen is more than twice that of solid fuel appliances, but of detached houses, the population uses coal or wood for gas heating and materials that are considered waste (furniture board, treated wood, plastics, etc.) are burned in addition to or instead of commercially available solid fuel. Solid emissions from wood combustion are significantly higher than from gas combustion, has a negative impact on air quality, especially in terms of particulate matter and nitrogen dioxide.

5.4.3. Ipar

After 31 October 2007 emissions limit value exceeded point source not operated. A
The Air Quality Plan concluded that no significant, substantive changes compared to the years before 2020

in terms of the amount of air pollutants emitted, thanks to the introduction of greening techniques, the continuous tightening of limits by legislation and mandatory compliance with BAT.

5.4.4. Agriculture

Much of the western part of the city is intensively farmed and mechanised. The city is exposed to pollution from agricultural cultivation (NO_2, NO_x, NH_3, N_2O, settling dust) and these pollutants can contribute to the formation of secondary inorganic particles such as PM_{10} and $PM_{2.5}$.

Planning area, Decree 4/2002 (X.7.) of the Ministry of Transport, Building and Urban Affairs on the designation of air pollution agglomerations and zones
Annex 2, the air pollution zone 9 - "Designated cities - Debrecen area".

Based on the available assessment data, the typical background pollution of the municipality can be summarised as listed or tabulated below.

- For **sulphur dioxide**, air pollution levels do not exceed the lower assessment threshold.
- For **nitrogen dioxide**, the air pollution level for one or more air pollutants is between the air pollution limit value and the tolerance limit.
- For **carbon monoxide**, air pollution levels do not exceed the lower assessment threshold.
- For PM_{10}, the air pollution level for one or more air pollutants is the upper assessment threshold and the air pollution limit value.
- For **benzene**, the air pollution level for one or more air pollutants is between the upper and lower assessment thresholds.
- For **ground-level ozone**, the air pollution level exceeds the target value.
- For **PM_{10}(As), PM_{10}(Ni), PM_{10}(Pb)** the air pollution level does not exceed the lower assessment threshold meg.
- **(PM_{10}) (BaP)**, the air pollution level for one or more air pollutants is the upper assessment threshold and the air pollution limit value.

15. Table 1: Typical background pollution in Debrecen

Polluting substance	SO_2	NO_2	CO	PM_{10}	Benzene	Ground-level ozone	PM_{10} Arsenic (As)	PM_{10} Cadmium (Cd)	PM_{10} Nickel (Ni)	PM_{10} Lead (Pb)	PM_{10} benz(a)-pyrene (BaP)
Zone Group	F	C	F	D	E	O-I	F	F	F	F	D

In the municipality of Debrecen, there are automatic measuring devices belonging to the National Air Pollution Protection Measuring Network, the nearest of which is the Debrecen-Klinika (Nagyerdei krt. 98.), so the data of this device were taken into account.

The baseline data to be taken into account in the study will be determined on the basis of the measurement results of the measurement container in 2022.

16. Table 3: Background pollution at Debrecen - Clinic based on automatic measuring equipment

	SO_2	NO_2	NO_x	CO	PM_{10}
Background pollution (µg/m³)	1	11,6	17	408	20

17. Table 1: Emission limit values for air pollutants (Decree 4/2011 (I. 14.) VM)

Pollutants	Air pollution limit value - 60-minute (µg/m³)	Air pollution limit value - 24 hours (µg/m³)	Air pollution limit value - annual (µg/m³)
Carbon monoxide	10 000	5000	3000
Nitrogen dioxide	100	85	40
Solid non-toxic powder	-	50	40
Sulphur dioxide	250	125	50

In the context of the changes in the air quality protection status in the period 2018-2022, we collected data on the air quality of the air quality protection status of Debrecen, Nagyerdei krt. 98.

For the Nickel parameter, the aggregated assessment of the OLM annual particulate matter $_{PM10}$ and $PM2_{.5}$ sampling programme was used. Since the measuring station at Debrecen-Klinika (Nagyerdei krt. 98.) not measure Nickel, the data from the automatic measuring station at Kalotaszeg Square, Debrecen were used.

The index score is given in the table below.

18. Table 1: The Debrecen, Nagyerdei krt. 98.

	SO2	NO2	*NOx*	PM10	**CO**	**Nickel***
2018	Excellent	Good	Good	Good	Excellent	n.a.
2019	Excellent	Good	Good	Good	Excellent	Excellent
2020	Excellent	Good	Good	Good	Excellent	Excellent
2021	Excellent	Good	Good	Good	Excellent	Excellent
2022	Excellent	Excellent	Excellent	Good	Excellent	Excellent

**Index evaluation of the environment of the automatic measuring station under the square of Kalotaszeg, Debrecen.*

An index-based assessment of the environment of automatic metering stations in Debrecen:

- Air quality is excellent for $_{SO2}$, CO and Nickel;
- Air quality is good for $_{NO2}$, $_{NOX}$ and $_{PM10}$.

The table below shows the results of the assessment of the last 5 years of hourly sulphur dioxide data, which indicate that the presence of sulphur dioxide in the vicinity of the monitoring station is unlikely to result in loads approaching the limit value.

19. Table 3: The Debrecen, Nagyerdei krt. 98.

	SO2							
	Annual average	**Maximum**	**Percentile**				**Data availability**	**Exceeding the threshold**
			50%	**75%**	**98%**	**99,9%**		
2018	3,7	47,1	3,2	4,8	8,9	21,6	80,4°%	0 db
2019	3,7	31,9	3,6	4,4	9,3	19,3	92,1%	0 db
2020	1,5	21,3	1,2	1,6	5	11,6	94,7%	0 db
2021	1,1	17,5	0,8	1,2	5,6	15	99,4%	0 db
2022	1	20,2	0,8	1,1	4,2	13,2	86,6%	0 db

The table below shows the results of the assessment of the last 5 years of hourly nitrogen dioxide data, which show that the annual average load of nitrogen dioxide is well below the limit value.

20. Table 3: The Debrecen, Nagyerdei krt. 98.

	NO2							
	Annual average	**Maximum**	**Percentile**				**Data availability**	**Exceeding the threshold**
			50%	**75%**	**98%**	**99,9%**		
2018	25,5	147,7	19,1	32,1	88,2	132,2	88,6%	77 units
2019	40,1	143,6	37,2	53,2	93,1	135	97,5%	114 pcs
	NO2							
	Annual average	**Maximum**	**Percentile**				**Data availability**	**Exceeding the threshold**
			50%	**75%**	**98%**	**99,9%**		

2020	23,5	154,2	17,9	29,2	75,9	123,3	92,9%	41 units
2021	25,3	177,6	18,5	31,3	87,5	140,7	90,2%	89 units
2022	11,6	101,3	8,3	17,6	40,8	62,9	81,8%	1 pc

The table below shows the results of the assessment of the last 5 years of hourly data for nitrogen oxides, which show that the annual average load for nitrogen oxides is significantly below the limit value.

21. Table 1: The Debrecen, Nagyerdei krt. 98.

	NOx						
	Annual average	**Maximum**	**Percentile**				**Data availability**
			50%	**75%**	**98%**	**99,9%**	
2018	31,4	396,1	21,8	36,9	122	274,6	88,6%
2019	29,4	331,4	19	35,9	133,1	239	93,3%
2020	29,5	257,5	21,3	35,5	110,4	211,8	92,9%
2021	31,4	403,8	20,7	35,5	135,1	295,1	90,2%
2022	17	219,1	12,8	24,1	60	156,7	81,8%

The table below shows the results of the assessment of the last 5 years of 24-hourly data for particulate matter, which indicate that PM10 concentrations in the vicinity of the monitoring station are unlikely to approach the limit value.

22. Table 1: The Debrecen, Nagyerdei krt. 98.

	PM10							
	Annual average	**Maximum**	**Percentile**				**Data availability**	**Exceeding the threshold**
			50%	**75%**	**98%**	**99,9%**		
2018	23	57	21	28	49	57	91%	7 pieces
2019	25	80	21	30	66	80	74,2%	21 pieces
2020	21	77	18	25	49	77	97,3%	5 pieces
2021	19	79	17	23	45	79	94%	5 pieces
2022	20	62	17	24	41	62	74,8%	4 pieces

The table below shows the results of the assessment of the last 5 years of hourly data on carbon monoxide, which indicate that the presence of carbon monoxide in the vicinity of the monitoring station is unlikely to result in loads approaching the limit value.

23. Table 3: The Debrecen, Nagyerdei krt. 98.

	CO							
	Annual average	**Maximum**	**Percentile**				**Data availability**	**Exceeding the threshold**
			50%	**75%**	**98%**	**99,9%**		
2018	385	2550	329	448	994	1711	83,3%	0 db
2019	377	1936	338	444	915	1548	78,1%	0 db
2020	421	1182	401	511	778	1108	54,2%	0 db
2021	436	2447	384	544	1034	1850	99,3%	0 db
2022	408	1647	419	544	874	1238	79,1%	0 db

The table below shows the results of the assessment of the last 5 years of nickel hourly data, which indicate that nickel is unlikely to be present in the vicinity of the monitoring station at loads approaching the limit value.

24. Table 3: Nickel results from the environment of the automatic measuring station under the Kalotaszeg square in Debrecen

	Nickel						
	Annual average ng/m³	**Maximum ng/m³**	**Percentile**				**Data availability**
			50%	**90,4%**	**98%**	**99,9%**	
2018	na	na	na	na	na	na	na
2019	1,12	5	1	1,07	2,48	4,86	100%
2020	1,09	3,54	1	1	2,15	3,46	100%
2021	1,28	8,36	1	1,5	1,52	7,98	100%
2022	1,5	1,5	1,5	1,5	1,5	1,5	100%

An assessment based on the results of the mobile measuring van in the vicinity of the planning area was not considered appropriate, as at the time of preparing the permit application, there was extensive construction work underway in the vicinity of the facility due to infrastructure improvements related to the development of the industrial park, BMW and other facilities being constructed in the planning area.

Based on the time series information, the measurement results considered, which are representative of the wider environment of the automatic monitoring network, indicate that in 2019, concentrations above the limit values were detected for NO_2 and PM_{10} in 1.3% and 0.2% of the year, respectively. The number of exceedances was significantly lower in the other years studied. The annual average concentrations are significantly below the limit value. According to the legal requirements, the air quality of the ambient air quality in the vicinity of the monitoring station (suburban background) is good to excellent.

5.5. Groundwater and geological medium

5.5.1. Talaj

5.5.1.1. Geological features of the area

The basement is carbon-paleogene flis, overlain by series of middle Miocene volcanics (rhyolite, dacite, andesite) several hundred metres thick. The major part of the near-surface sediments is quicksand, developed in thicknesses of 1-25 m, formed at the end of the Würm. No directional grain compositional regularity can be discerned in its evolution. A characteristic feature silicification. Its last phase of movement is late glacial. A relatively large area is covered by river sands ('washed sands'), calcareous sands, 1-5 m thick, associated with shearwaters. These were formed in several stages during the Holocene. Pleistocene loess (eQp^{il}) and infusional loess (hQp^{il}) are found in and around the study area.
3 3

5.5.1.2. Soil characteristics[2]

Sandy soils dominate the mosaic (80%). 56% of the area is dominated by quicksand, 16% by humic sandy soils and 8% by siliceous brown forest soils. Their use is, in order, 35-55-40% as arable land, 20-15-20% as pasture, 5-0-5% as vineyards and 40-30-35% as forest

[2] REGISTER OF SMALL LAKES IN HUNGARY (2010)

happens. Farming on sandy soils is possible by keeping livestock of an appropriate size and/or by manure application. The forest area on the agricultural sandy soils has been reduced, which increased the risk of deflation and damage. On the loamy surfaces (1%) of the margins of the small area there are meadow, deep saline meadow pondweed, stony meadow solonyec and soloncac soils.

The loess depressions, however, contain only small patches (<0.5%) of saline soils with near-surface water table water. 60% of the chernozem soils are used as arable land and 30% as meadow pasture. They have a low forest cover (max. 10%). The saline soils can be used as pasture. The deep depressions are covered with sandy loam, carbonate to slightly acidic meadow soils with a water table depth of 70-100 cm, with a surface carbonate or slightly acidic chemistry, and a water table depth of 70-100 cmThe meadow soils with low fertility (int. 30-45) can be used 40% as arable land, 30% as meadow pasture and 30% as woodland. In places with a water table depth of 40-70 cm, 3% of the area is covered by marshy meadow soils. Despite the high accumulation of organic matter, their fertility class is 25-35 (int.) because of the excessive moisture. Half of it is used as arable land and 25-25% as pasture and woodland. The agricultural potential of the landscape is low, the value lies in the flora and fauna of its specific habitats.

Based on the AGROTOPO online interactive map database, the planning area contains a calcareous chernozem genetic soil type.

Previous surveys:

Based on the 'Red Flag' report prepared by Deloitte Ltd. for the Client, in March 2022 BIOCENTRUM Ltd. carried out 4 borehole (M1-4) soil and groundwater quality investigations on the planned property near its corners. The boreholes were drilled to a depth of 10 m below groundwater level. The characteristic stratigraphy revealed by the boreholes, based on the M2 borehole, is as follows:

25. Table 2 Characteristic sequence of strata revealed by drilling M2

Depth	Layered description
0,0-1,0 m	Humus topsoil
1,0-2,7 m	Brown, silty sand
2,7-4,6 m	Brown clay
4,6-7,0 m	Brown sandy loam
7,0-7,5 m	Brown silty clay
7,5-10,0 m	Brown silty sand

Fugro Consult Ltd. (hereinafter referred to as Fugro) prepared a geotechnical design report supplemented by soil quality and groundwater quality investigations on behalf of the Client in September 2023. The related field investigations were carried out between 6 and 20 July 2023, in the course of which the following tasks were performed:

- 64+ 7 static pressure soundings (25 m and 6 m deep)
- 2 seismic static pressure soundings (30 m deep)
- 15+ 9 boreholes (6 m, 12 m and 25 m deep)
- surveying of soil explorations
- laboratory tests on soil mechanics and water chemistry.

Based on the soil analysis report, 8 layers were identified up to a depth of 30 metres:

After the humus layer, the first layer was a loose sandy silt/coarse silt layer up to -2.60 m. Below this, loose clay/silty clay to -7.6 m. The excavation continued with a medium dense silty sand/sand layer up to -16.80 m, which was replaced in places by silt or clay layers. The next layer was kneadable silty clay/clayey silt, extending to -20.3 m below ground level. Between -20.3 m and -24 m, very compact sand was , followed by medium compact sand/silty sand to -26.0 m. Finally to the bottom of the excavation,
- Up to 30.00 m, there is a hard silty clay/coarse silt layer, occasionally replaced by clay layers.

The baseline survey included the construction of 10 shallow (6-10 m) sampling boreholes between 24-26 April 2024, with a diameter of 130 mm, using the dry spiral technique. During the field work, the original ground surface was already excavated in several stages over a large part of the area. Due to the size of the area, the sampling boreholes will involve several field trenches. One sampling point (EF-2) was established on the original field surface, so this is the only one where humic topsoil (80 cm) was identified. The shallow geology of the area is illustrated in Table 26 with the stratigraphic sequence of borehole EF-6 from the central part of the area. The stratigraphic sequence is in good agreement with the results of the Deloitte tests.

26. Table 3: Stratigraphy of sampling well EF-6

Depth	Layered description
0,0-1,6 m	Light brown, silty sand
1,6-3,7 m	Light brown, slightly silty clay
3,7-4,2 m	Light brown, sandy silt
4,2-5,7 m	Reddish brown clay
5,7-7,0 m	Light brown, silty sand

5.5.1.3. Soil contamination status

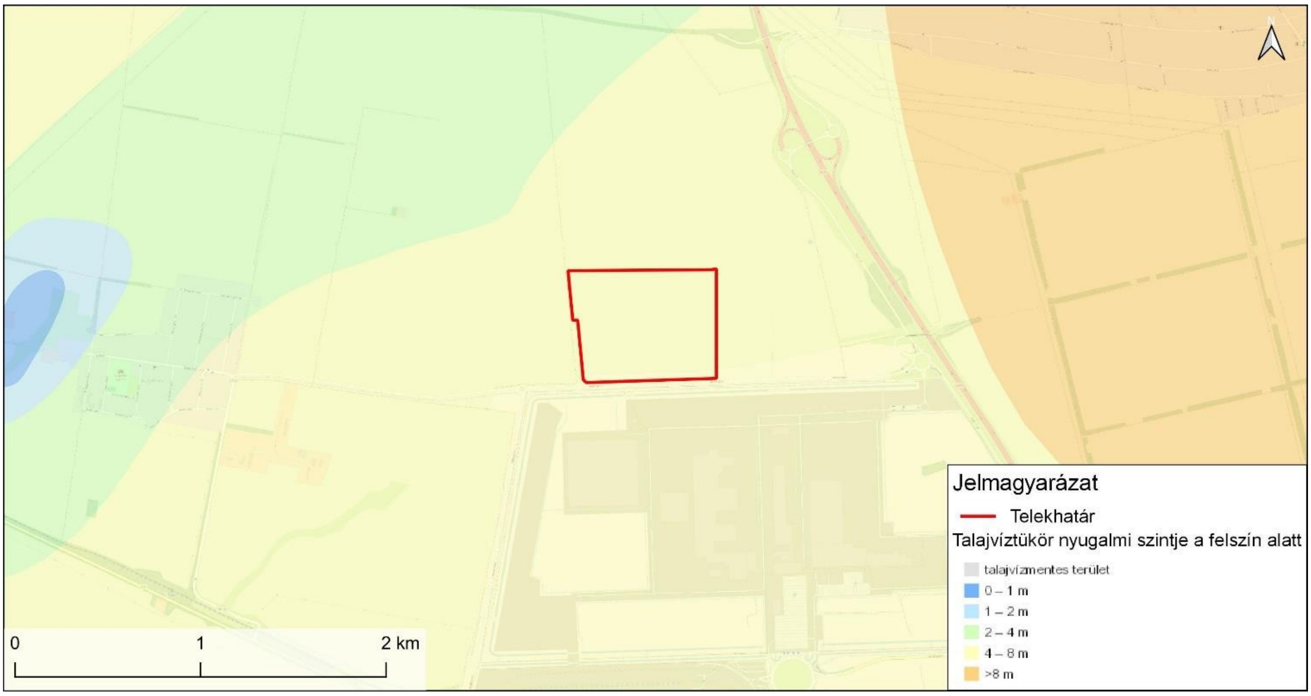
During the survey carried out by Biocentrum Ltd. in March 2022, an accredited laboratory test (Bálint Analitika Ltd.) was performed on 2 soil samples (2.0 and 6.0 m) per point at each of the 4 drilling points. In the course of the survey, the soil was tested for the presence of VOC and TPH components, but the laboratory results showed that the concentration of no component exceeded the 'B' contamination limit value specified in the joint decree 6/2009 (IV.14) of the Ministry of Agriculture, Forestry, Environment and Water Management.

Within the framework of the baseline report (April 2024), which is part of the present documentation, a total of 52 soil samples were taken from 10 sampling boreholes, of which 30 samples were analysed in the accredited laboratory of Eurofins Analytical Services Hungary Kft. The tests included all substances present in the technology that can be measured from environmental samples using current laboratory practice. None of the tested components with contamination limit values according to the joint decree 6/2009 (IV. 14.) KvVM- EüM-FVM were detectable in the cultivated soil and natural sediments. A detailed contamination assessment, including the demonstration of components without contamination limit value 'B', is presented in the baseline report, which is attached as Annex 1.8.

5.5.2. Groundwater

Based on the groundwater level map of the Hungarian Mining and Geological Survey (MBFSZ), the shallow groundwater table in the study area is expected to have a water table at a depth of 4-8 m below the surface. A local minimum is to the west of the property, where the groundwater table is between 0-1 m (12).

minimum may be caused by the Sight reservoir located west of the project area and an unnamed intermittent watercourse (HTVR H-1/1 transmission line).



12. Figure 1: The study area on the groundwater depth map (MBFSZ)

The groundwater bodies located at deeper levels below the project area, as defined in the River Basin Management Plan (RBMP3), are:

27. Table 1: Groundwater bodies at deeper levels below the investment area

Name of groundwate r body	Type of website	Water body code	Average roof depth [m]	Average depth of the deck [m]	Average thickness [m]	Reporting to
Southern Nyirség, Hajdúság	Shallow porous, crumbly, cold, downstream	sp. 2.6.1	3,5	33,5	15	• feeding wetlands, • groundwater evaporation • FAVÖKO Contact
Southern Nyírség, Hajdúság (stratified water)	Porous, crumbly, cold, downstream	p. 2.6.1	4	420	416	• between bodies of groundwater water circulation
Northeastern Plain porous and fissured thermal	Friable, thermal, upstream	pt. 2.4	400	3000	2600	• between bodies of groundwater water circulation

5.5.2.1. Characteristics of the groundwater table

During Biocentrum's survey in March 2022, the water table at the 4 test points was 7 m below the ground level of each borehole, while the measured still water levels varied between 6.5 and 6.8 m below the surface.

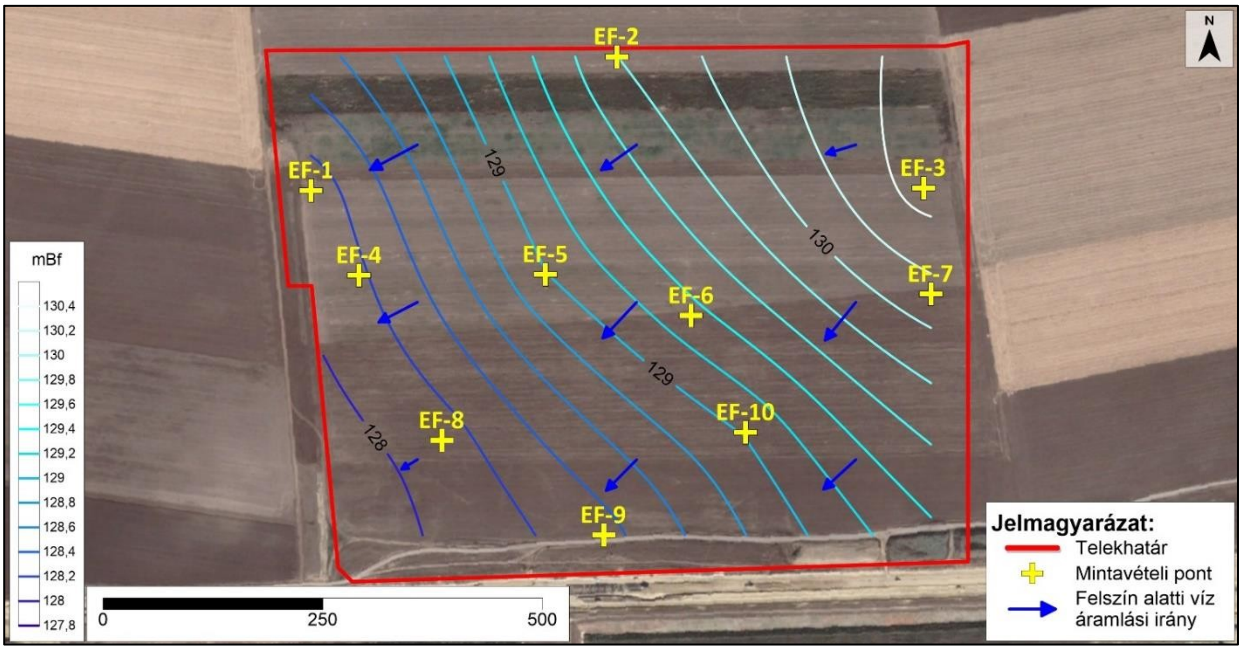
According to the Fugro report of September 2023, the shallow groundwater table slopes from east to west following the natural ground surface. The measured groundwater table ranged from 127.54 to 129.4 mBf absolute elevation. The maximum groundwater level estimated for the entire area was 129.5 mBf, while the maximum groundwater level was 130.5 mBf. As groundwater levels vary throughout the area, the relevant groundwater level for each building must be examined individually.

A baseline report, prepared as Annex 1.8 to this document, was also carried out in April 2024 to determine the water level in the 10 temporary sampling boreholes deepened and to measure the water level at rest. During the simultaneous water level measurements (26.04.2024), the values of the resting water levels ranged from 2.21 to 6.21 m below the field levels of each borehole point, with absolute heights ranging from 128.07 to 130.49 mBf (Table 28).

28. Table 1: Groundwater levels at rest measured in temporary boreholes in the area in April 2024

Drilling point	EOV Y	EOV X	Z ground level [mBf]	Groundwater table at rest from ground [m]	Retirement groundwater level [mBf]
EF-1	835240,16	251604,26	132,14	4,07	128,07
EF-2	835588,14	251756,23	135,85	6,06	129,80
EF-3	835937,12	251606,91	136,70	6,21	130,49
EF-4	835294,83	251507,74	132,94	4,77	128,17
EF-5	835507,14	251508,84	132,36	3,37	128,99
EF-6	835672,87	251462,05	132,28	2,95	129,33
EF-7	835945,67	251486,40	132,34	2,21	130,13
EF-8	835389,00	251320,26	132,14	4,72	127,42
EF-9	835573,15	251212,60	133,58	5,26	128,32
EF-10	835734,79	251329,49	132,28	2,21	127,42

Based on the isovalley groundwater level map constructed from the still water level data, the direction of the local flow is southwest. This correlates well with the orientation found in previous studies (local low point: L-I Viewpoint - towards the reservoir, see Figure 13)



13. Figure 1: Groundwater level map of the area based on measurements in April 2024

5.5.2.2. Groundwater contamination baseline status

The groundwater quality analyses carried out by Biocentrum Ltd. in March 2022 covered concentrations of SVC, toxic heavy metals and TPH. The accredited tests were performed by Bálint Analitika Ltd. A laboratóriumi eredmények alapján a vizsgált 4 db vízmintában nem tártak fel a 6/2009 KvVM–EüM–FVM együttes rendeletben meghatározott ’B’ szennyezettségi határérétket meghaladó koncentrációkat, kivéve a nitrát esetében, ami 3 vizsgált vízmintában volt magasabb, mint a ’B’ határérték (max. TPH was present in all samples at detectable levels (28.7-54.8 µg/l) but below the pollution limit value (100 µg/l).

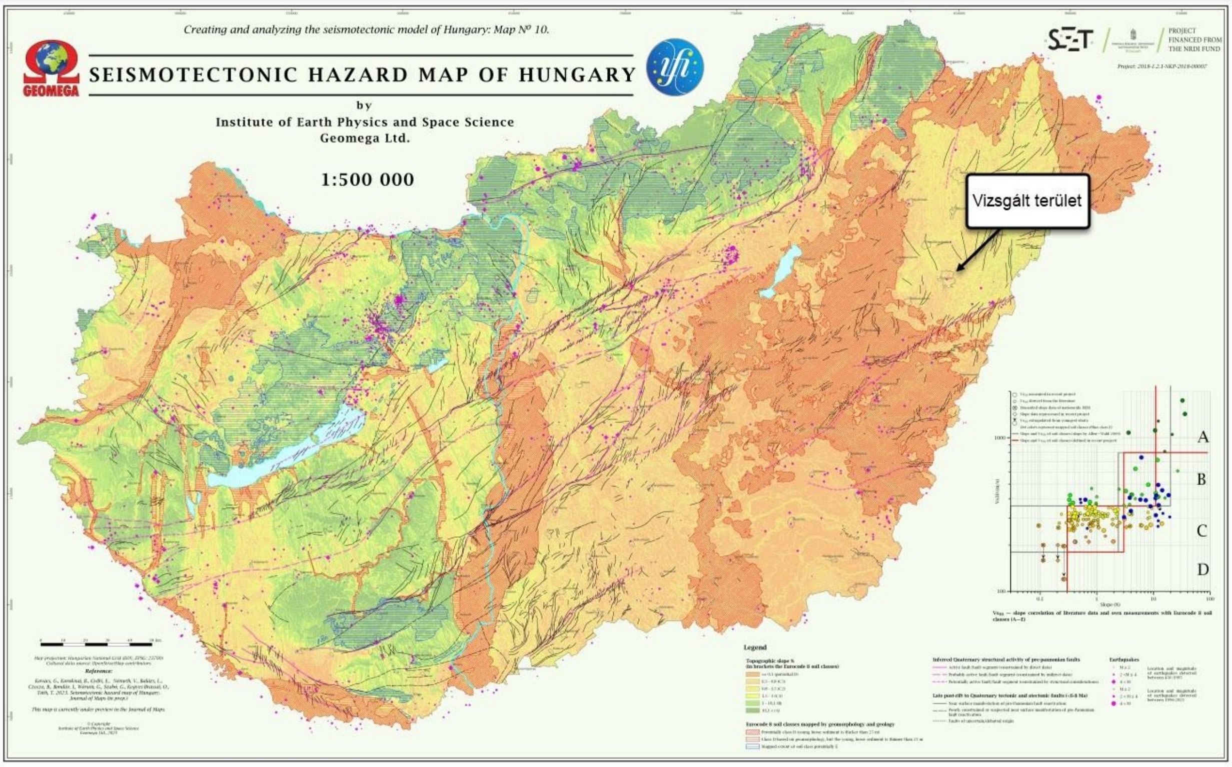
In the Fugro (September 2023) geotechnical report, the groundwater was analysed for corrosion, but no contamination assessment was carried out.

During the baseline study (April 2024), detailed analyses of 10 water samples were carried out. Based on the results, some of the components with pollution limit values (sodium and nitrate), aluminium and chromium (VI) were found in concentrations slightly above the 'B' pollution limit value. None of the organic pollutants tested showed elevated concentrations. The other substances analysed were below or below the legal limit value ('B' contamination limit).

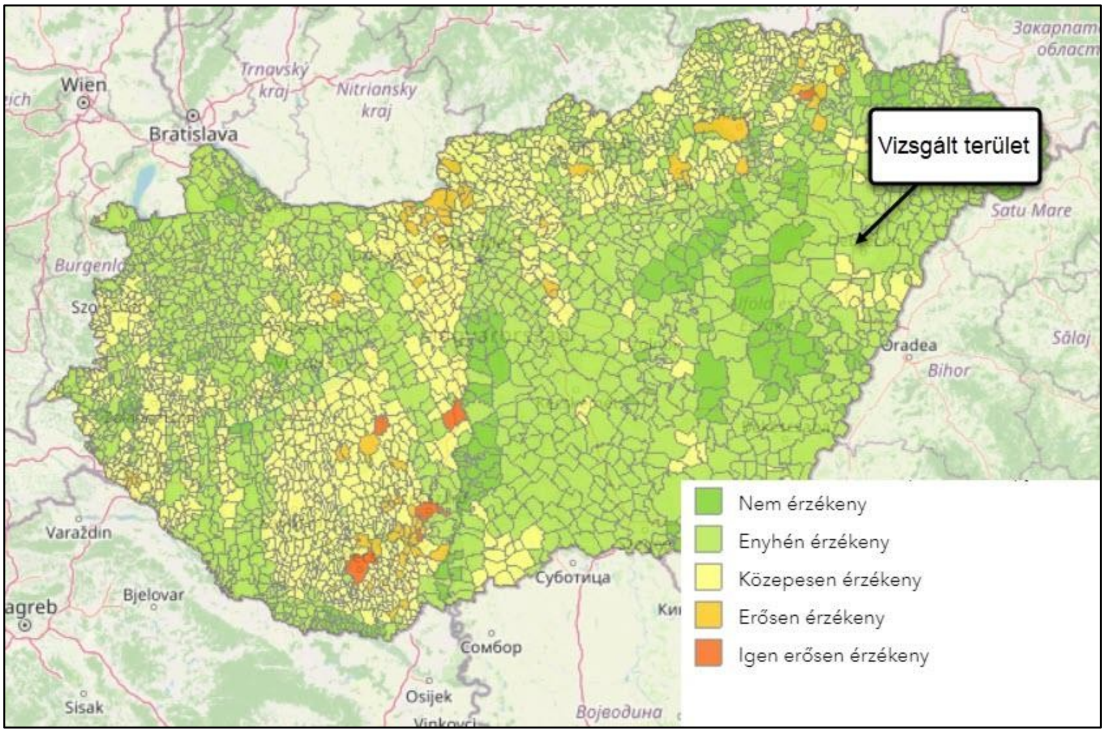
A detailed description of the extensive analytical work carried out within the scope of the study on the substances present in the technology and currently measurable (including components without 'B' contamination limits) is presented in the baseline report attached as Annex 1.8.

5.5.3. A natural disasters (especially earthquakes, water damage) exposure

The seismicity of the area is low and its seismological situation is shown in Figure 14.

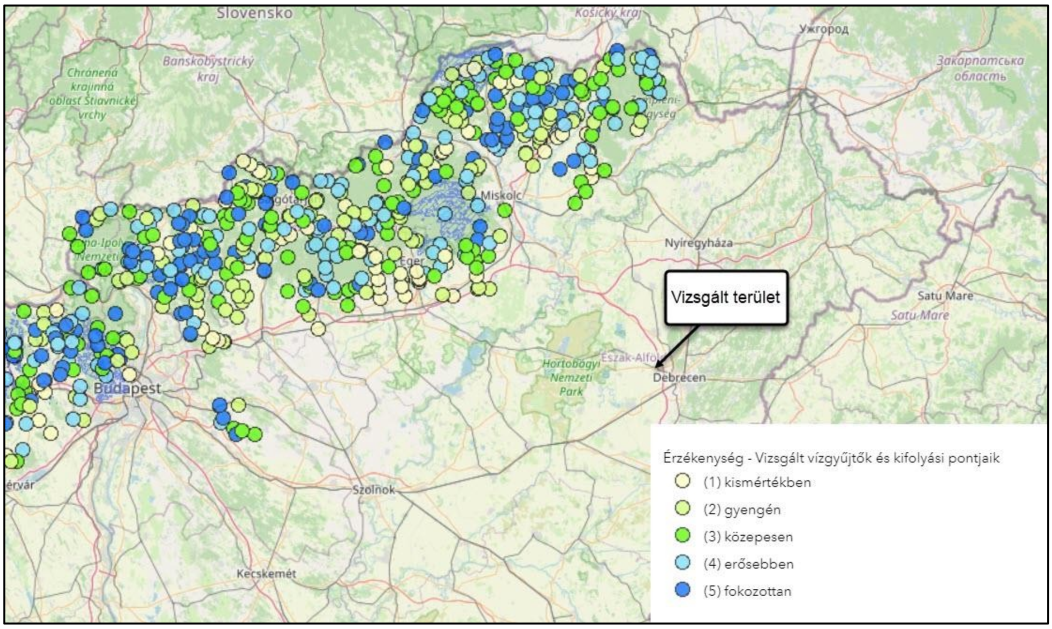


14. Figure 1: Earthquake vulnerability of the planning area



15. Figure 1: Groundwater exposure of the planning area

The planning area is not exposed according to the NAG database, based on the geological formations affected by surface movement, slope and the damage events within the administrative boundaries of the municipalities.

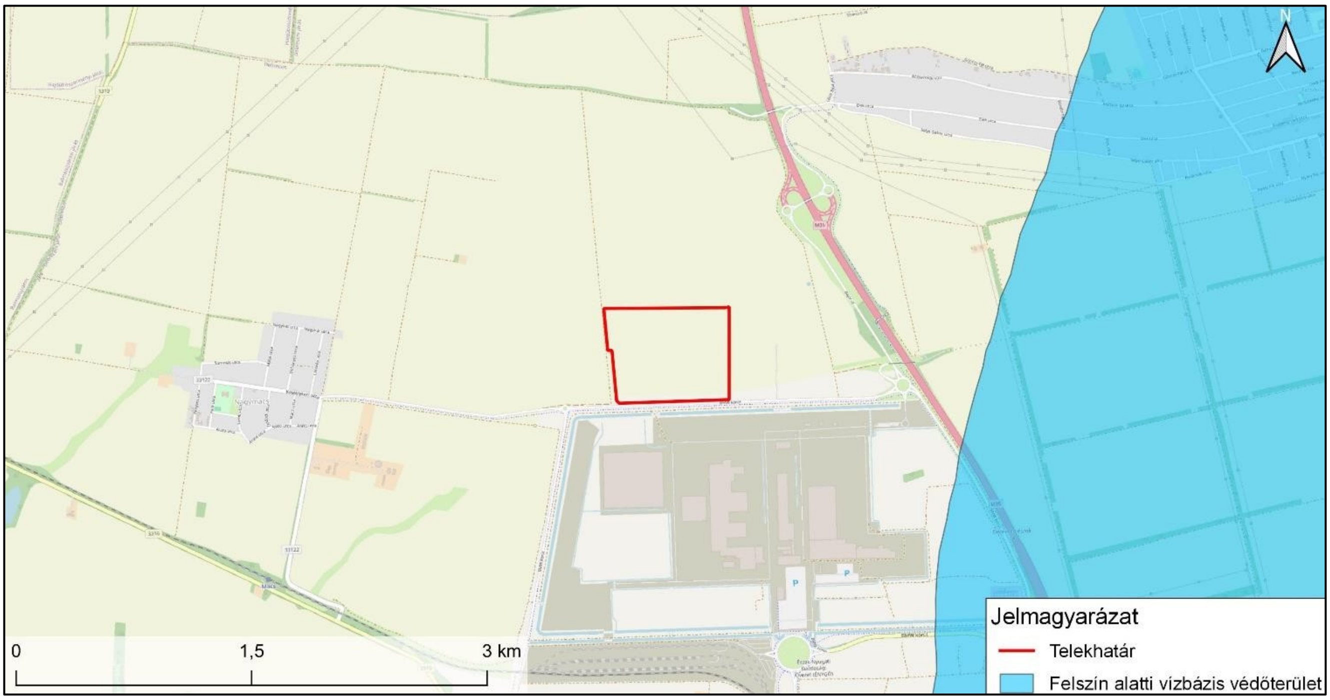


16. Figure 1: Area at risk of flash floods based on NAGR data

According to the National Water Directorate General, Debrecen and its surroundings are not at risk of flooding. In the absence of a watercourse in the planning area, the risk of flash floods can be excluded.

5.5.4. Aquifer protection protection areas

The study area does not affect priority groundwater quality protection areas and aquifer protection areas. The nearest vulnerable aquifer to be protected is located to the east of the site, at a minimum of 2 100 m (upstream, based on experience to date), which has been identified in connection with the production wells of the Debrecen I waterworks.

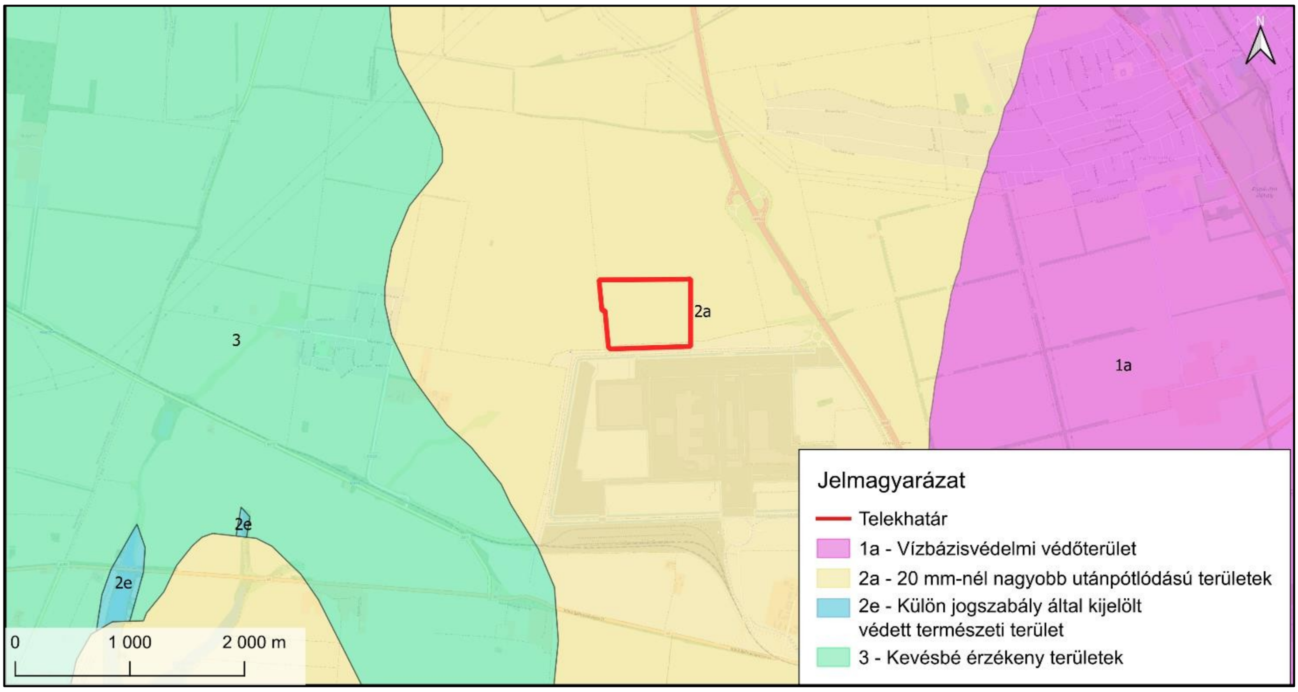


17. Figure 1: Aquifer protection areas in the vicinity of the planning area

5.5.5. Groundwater sensitivity

The planning area and its surroundings are classified as sensitive according to the provisions of the Decree 219/2004 (VII.21)
As required by the Government Decree. Area classification: 2a, areas with a recharge of more than 20 mm.

The area is a category B nitrate sensitive area according to the *FVM Decree 43/2007 (VI.1.) and* the *Government Decree 27/2006 (II. 7.)*.



18. Figure 1: Groundwater sensitivity classification of the area

5.6. Surface waters

According to the National River Basin Management Plan, the study area is located in the Tiszántúli Water Management Directorate, in the
It is located *in the Hortobágy-Berettyó sub-basin.*

There are no bodies of surface water within the project area and within 4 km of the project boundary.

The nearest bodies of surface water to the planning area are the following standing waters:

- View of the lake bath 3 880 metres
- Visual Image Reservoir (L-I reservoir) 3 770 metres
- Tócó-I reservoir 5 080 metres
- Tócó-II reservoir 4 960 metres

Note that the surface water body marked on the map as the "Agricultural University drainage pond" has been filled, the
does not exist.

The nearest watercourses to the study area are the Pece Lake, which connects the Látóképi Lake Baths and the Látóképi Reservoir with the Eastern Main Canal. The watercourse is located 3 900 m to the DK of the project area. The largest natural watercourse within a 5 km radius of the investment area is the Tócó Canal, located 4 800 m to the west, which is also the most important watercourse in the area.

The site is located in the south-eastern part of the area of sub-unit 2-17 Hortobágy-Berettyó for the classification VGT. The area is located in the catchment area of the Hortobágy-Berettyó main channel, sub-catchment of the Tisza, in the eastern part of Hajdú-Bihar county.

According to the description of sub-unit VGT3, surface water use in the sub-unit is dominated by agricultural (irrigation, fish pond use, ecological) and industrial and municipal water use. Groundwater abstraction is dominated by industrial water use after drinking water and agricultural abstraction.

In the catchment, industrial loads account for one third of municipal loads. High nutrient levels and stagnant water are a source of serious water quality problems.

After crop and livestock production, the sub-unit is dominated by chemical and food industry emitters. Therefore, pesticides and pharmaceutical residues are a problem, but there is little information available on their extent due to lack of monitoring. Wastewater from industrial plants is most often discharged to municipal wastewater treatment plants.

The most important task identified by the Tiszántúli Water Management Directorate is to keep the water collected in the area in the possible quantity and to provide the necessary water replenishment through existing and future systems to meet the demand. There is a strong emphasis on integrated stormwater management both in the periphery and within the municipalities. In the open countryside, a significant proportion of the inland water channels serve not only to drain runoff but also to meet irrigation needs.

A significant and intractable problem is the regular drought caused by climate change, the regular lack of snow cover, and the prolonged summer heatwaves.

The Sightseeing Reservoir (VGT designation: Reservoir L-I, code: ANS521) is a standing body of water with permanent water cover for recreational purposes.

VGT assessment of the water body

- moderate (3) for biological elements - the score is determined by the macrophyton-macroscopic aquatic vegetation parameter (moderate, 3), phytobenthic algae not scored due to lack of data, phytoplankton scored good (2);
- physico-chemical elements are excellent (1);
- moderate according to hydromorphological elements (3);
- specific pollutants, both without with persistent, bioaccumulative and toxic (PBT) elements (2).
- ecological status with and without PBT components is moderate (3);
- chemical condition is good (2).

The overall assessment of the water body is moderate (3). The integrated status assessment is determined by the biological-ecological and hydromorphological status.

VGT proposes the following measures to improve the status of the water body:

- improving the ecological moderate (3) rating to achieve a good (2) rating.

- Improving the physico-chemical status is a task that extends beyond 2027 and is therefore exempted with code T1 (Recovery of water quality of surface water body will take longer). The following packages of measures are proposed to reduce diffuse pressures:
    - to reduce nutrient pollution from agriculture:
        - 2.1 Reducing nutrient pollution from agricultural sources by promoting good farming practices (nitrate sensitive areas)
        - 2.2 Additional measures to reduce nutrient loads and losses agricultural production and to increase nutrient use
        - 2.3 Other soil improvement and soil protection interventions
        - 2.4 Land conversion (field-grassland, field-forest, field-wetland conversion) and maintenance of existing grassland, forest and wetland areas
        - 2.7 Filtration of inland waters from agricultural land before discharge the receiving water body
    - reduce sediment and pollutant loads from soil erosion and/or surface run-off:
        - 17.1 Pollutant and sedimentation and leaching through the use of crop production technologies
        - 17.2 Soil erosion control by planting vegetation
        - 17.3 Soil erosion against technical installations, landforms construction of structures (gully bunds, sediment barriers, etc.)
        - 17.4 Establishment of water protection strips and buffer zones along watercourses and lakes
    - other general measures to reduce diffuse pollution
        - 12.1 Advice on sustainable nutrient management and use of plant protection products
        - 12.2 Water-saving crop production methods, irrigation advice
        - 12.3 Regional water retention, landscape management advice
        - 12.4 Erosion control, soil conservation advice
- aims to improve the hydromorphological status after 2027, and therefore proposes ecological exemption T2 (Hydromorphological conditions will take longer to recover);
- chemical status good, the objective is to maintain it; no action proposed;
- nature conservation: no measures proposed

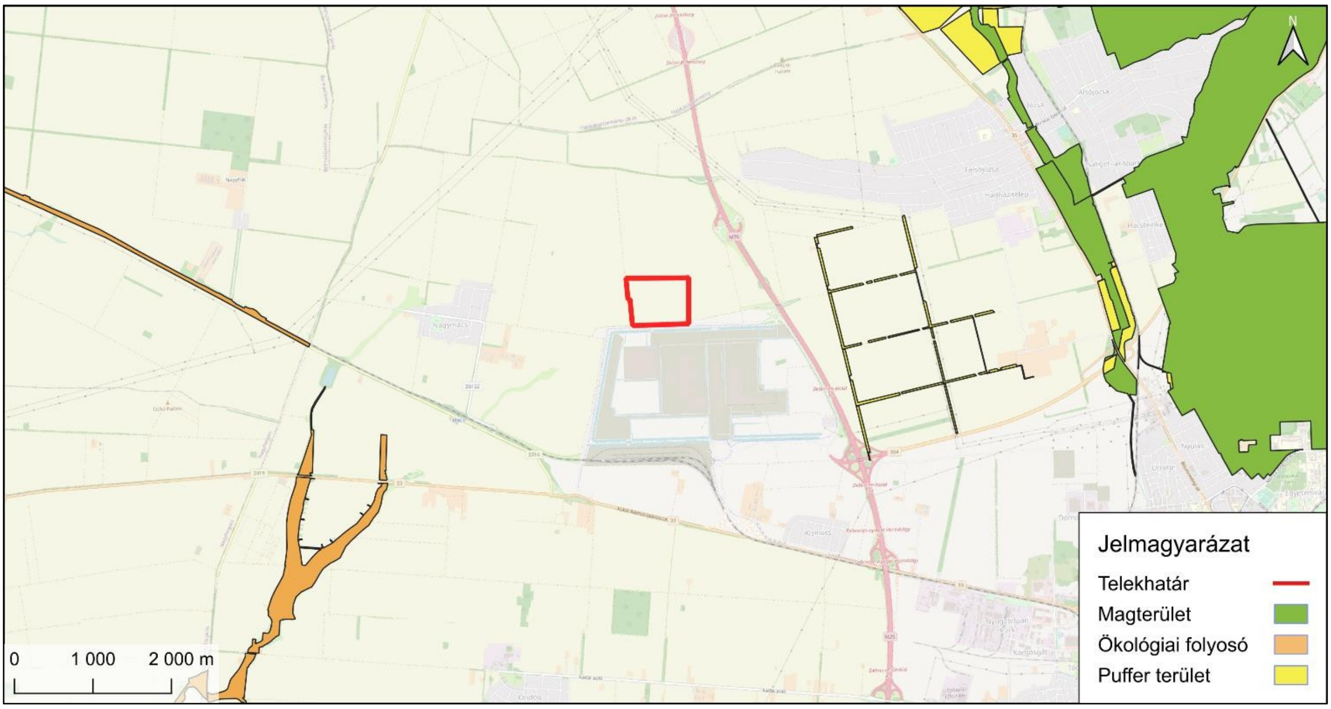
19. Figure 1: Location of surface waters in the vicinity of the planning area

5.7. Nature and landscape protection

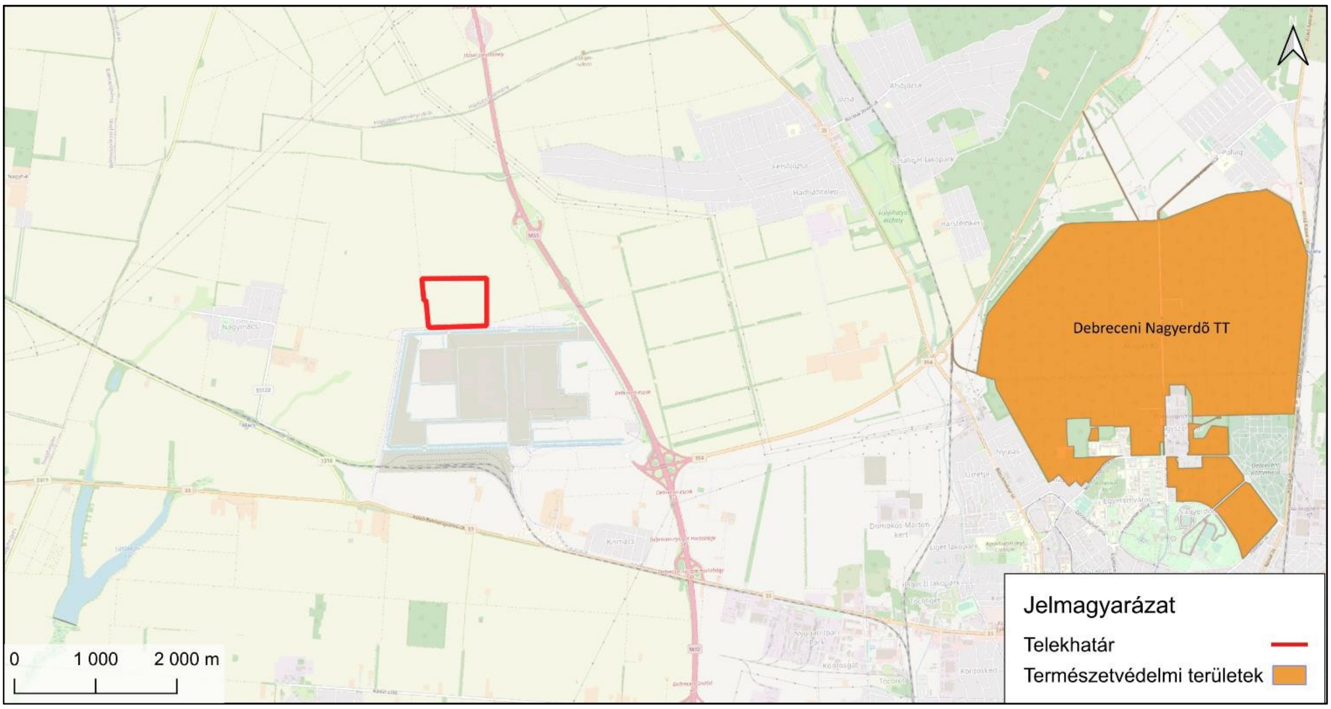
There are no areas of nature conservation and landscape value in the immediate vicinity of the facility. The location of the nearest sites of nature conservation interest are shown in the following figures, and their distances are listed below.

- Distance between elements of the national ecological network:
  - Nearest ecological corridor: 3 445 metres
  - Nearest ecological buffer area: 1 790 metres
  - Nearest core area: 4 804 metres
- Protected and specially protected natural area of national importance:
  - Nearest protected natural area (Debrecen Nagyerdő TT): 6 089 metres
- Minimum distance to Natura 2000 sites:
  - Special Area of Conservation (Tócó Valley): 4 913

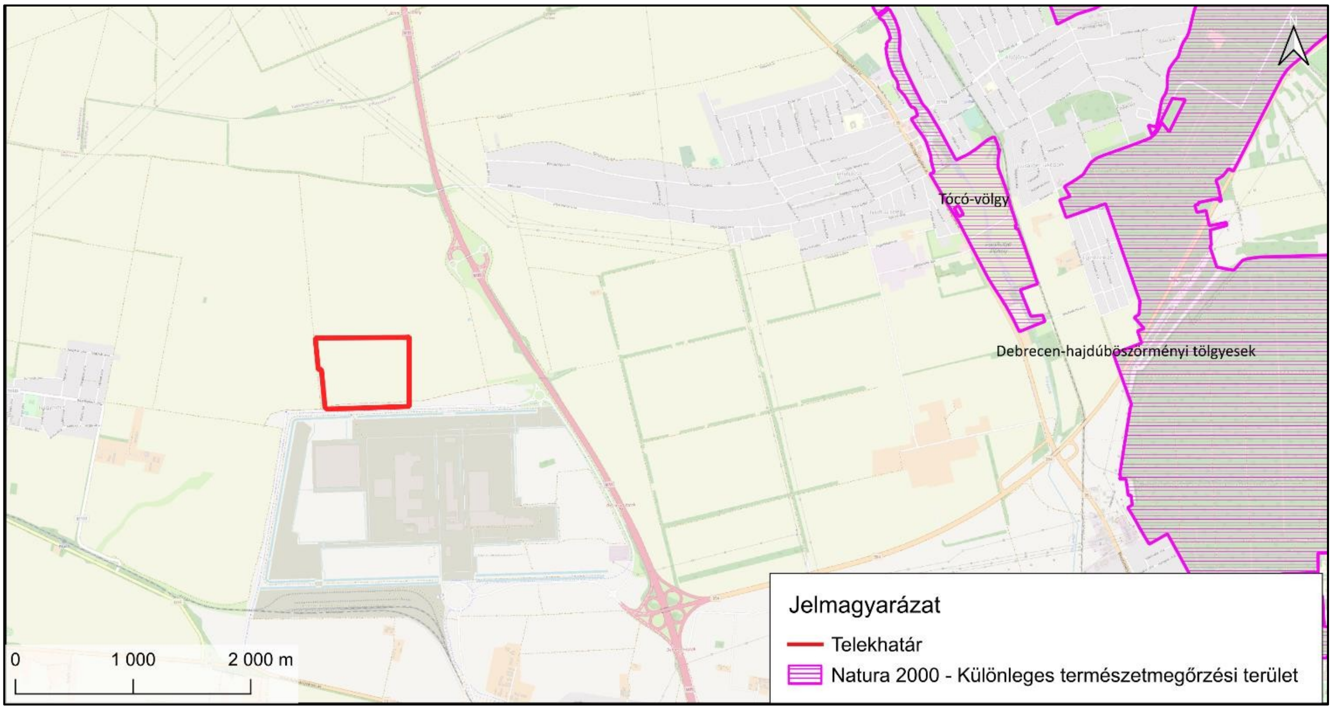
metres No locally protected natural value is affected by the project.



20. Figure 1: Location of the elements of the ecological network in the vicinity of the planning area



21. Figure 1: Location of protected and specially protected natural areas of national importance in the vicinity of the planning area



22. Figure 1: Location of Natura 2000 sites in the vicinity of the study property

5.7.1. Delimitation of the study area for the conservation of wildlife

The land of Debrecen 0237/405 which was affected by the establishment of the battery manufacturing plant of Eve Power Hungary Kft., was registered as intensively cultivated arable land for many decades before the withdrawal. The area, which was made up of several medium sized plots, was used as a cultivated area a few years ago. The property is currently zoned for commercial use in accordance with the planned industrial use, The planned factory area covers an area of 45 ha. The planned building density within the plot is approximately 33.35%, and the biologically active areas, i.e. the areas left as green space, will account for almost 53% of the total area. The remaining open areas within the site will be for other uses, mostly paved, and will be used mostly for loading, transport and car parking. The spaces between the factory buildings in the part of the site to be developed will be grassed, landscaped patches, paved with paving stones or asphalt, according to their function (Fig. 23).

The planning area is located in an established industrial-commercial environment in the north-western outskirts of Debrecen. The industrial area is located directly adjacent to the BMW factory site to the north. The EVE site is located in a 100 ha supplier park on a 45 ha site. Other facilities are being built on the adjacent 55 ha site. These areas are adjacent to the EVE site. The site is located approximately 1,5 km north-east of the main streets of the Debrecen-Józsa district. In a westerly direction, about 1,7 km away, the eastern streets of Nagymacs begin. The residential areas of the city of Debrecen are about 6 km away to the south-east. In the vicinity of the planned plant, about 700 m east of the plant, the M35 main road runs alongside the North-Western Economic Belt suppliers' park. To the south-east is the 3316 road, about 2 km away, and the 33 main road 2,3 km away. To the south-west is the Kismacs district, and the Debrecen-Balmazújváros railway line and a railway terminal run along the south (Figure 23).

In the planning area, as well as in the surrounding area, the natural conditions typical of the intensive arable land of the region have been maintained. Only in the field of the Debrecen-Balmazújváros road and the access road to Nagymacs and along the railway is there a sparsely disturbed, strip-like wooded area, the lower level of which is characterised by sparse shrub and herbaceous vegetation, defined by weed communities. In arable land intensively cultivated with agro-technology and in the surrounding area, there is a complete absence of natural or semi-natural communities of organisms, in accordance with the land use and function. The uncultivated fields and the dried-up, ploughed-up remnants of the Pece valley have completely lost their original natural character. In the approximately 2 km zone of the planning area, in a predominantly treeless environment, there is no breeding of even the most common bird species typical of the area. At the most, they are found in the vicinity of the indirectly affected Big Mach and in the wooded areas along roads and railways.

In terms of landscape and nature conservation, there are some areas and habitats of some importance in the broad surroundings of the planning area, mainly along the Debrecen-Balmazújváros road and railway, and on the Látóképi-reservoir in a south-westerly direction. The Tócó valley, the oak forests of Debrecen-Hajdúböszörmény and the Debrecen Nagyerdő, which are relatively isolated from the planning site, start about 6 km away. No habitats of major conservation importance or protected natural values are known or expected to occur within several kilometres of the planned plant site. It can be provisionally concluded that in the industrial, transport and agricultural environment concerned, no natural habitats and natural values of higher importance are foreseeable to be affected by the impacts associated with the planned construction and subsequent operation. Human influences, both past and present, which are very intense, are a fundamental determinant of the landscape functions and ecological characteristics of the area. Even the remaining patches or strips of semi-natural areas in the area are not immune to anthropogenic influences and their capacity to sustain significant natural values is very limited.

In the light of the above, it can therefore be concluded that the delimitation of the site of the proposed plant and its service facilities is not of nature conservation significance due to the environmental condition of the area concerned.

The studies and analyses carried out in the garden of the landscape and nature conservation findings for the planning area focused on the general character of the wildlife, but mainly on its qualitative baseline condition. The landscape and nature conservation analyses in the documentation covered first and foremost the directly affected land parcel and its immediate surroundings (estimated general wildlife conservation impact area).

23. Figure 1: Location of the study area as a planning area (outlined in red), its surroundings in the existing landscape structure and the layout of the planned development (inset).

In terms of nature conservation and wildlife protection, the study area has a fairly homogeneous structure. The surrounding intensive ploughland, the very large building area to the south, the more distant paved and built-up areas and the inter-urban strips between them, and the remnants of the permanently dry bed of the Pece stream, can at best be classified as biologically active areas to a limited extent. There are currently no biologically active surfaces that have stabilised to a certain extent in the planning area and the boundary area. There are currently no wooded or other landscaped areas in the areas associated with the car park under construction, but at most sparsely grassed, but rather weedy areas along the developed building complexes and constructed internal roads. The latter have no wildlife conservation value. There are no areas of potential habitat value for wildlife in and around the proposed factory site. In the vicinity of Nagymacs, the wooded shrubland along the railway and the Debrecen-Balmazújváros road and the Látképi reservoir are not part of the study area, they are well outside the estimated range of predicted impacts of relevance to nature conservation (Figure 23,

29. Figure)

survey covered the general characteristics of the habitat, but mainly the qualitative baseline condition, in particular of the study area and its immediate surroundings (estimated general habitat conservation area).

During the establishment of the plant and its subsequent operation, the impact factors resulting from the expected high levels of use and the highly disturbed character will continue to be dominant, which can also be generally observed for the condition of existing habitats in the area. In the study area and its surroundings, the intensive plough fields, the built-up area and the surfaces between the parts of the area not yet built up or paved over are at most composed of so-called 'specifically sinanthropic' representatives of the natural fauna of the area, but even these are not significant and stable. The more distant stands of trees, mainly planted for conservation purposes, outside the perimeter, are dominated by Turkestan elm, sparsely stumped oak, native ash, acacia, yew and other poplar species, but also include a significant number of spontaneously planted silver fir and some idol woods. Along the edges of wooded areas and other small patches of long disused woodland, and along transport routes, there is a colonisation of bramble, black elder and wild rose. These latter areas have been occasionally or regularly mown, with uncharacteristic ruderal vegetation and patches of tall weeds in the ditches. There are also no patches of relatively stable vegetation in the area of influence, with no woody vegetation that might be considered remnants of the loess grassland vegetation originally characteristic of the area. In the grass strips or patches between the field parcels, which are permanently unused but regularly disturbed, there is a vegetation of heathland with a characteristic vegetation of habitats of similar characteristics in the area, without any trace of natural communities.

The field observations of the studies also covered the more remote tree stands, scrub margins, and the drying, weedy reedbeds and tall fescue habitats of the remnant Pece Lake, and their biota, although they are outside the estimated general wildlife protection area, but could be affected by a potential disaster event, albeit in an unforeseen way and to an unforeseen extent. In addition to assessing the baseline status of flora and fauna in and around the study area, the data generated can be used to analyse the impact of impact factors on living systems, both in the directly affected area and in the estimated general biosphere reserve. The analysis of the expected impacts on the nature conservation relevance of the near-natural and protected areas of the wider area and the wider area of the study area has been carried out, mainly in terms of the species of flora and fauna of high conservation importance and habitat types in these areas.

For the more valuable and sensitive wildlife species, the highly degraded habitats in the area of influence, defined by secondary vegetation, ruderal or weed vegetation, subject to disturbance and intensive use, are of little conservation importance. In the study area itself and its surroundings, there are no patches of stabilising vegetation even along the established routes, and the only vegetation remaining in the area of influence is ruderal vegetation. Based on the available data and field experience, it is clear that the study area and its immediate surroundings have been subject to intensive land use for a long time, resulting in the persistence of the poor natural conditions that still prevail today. In the wider area of the study area, in habitats that are at most potentially (disaster situation) and indirectly exposed to indirect impacts, in areas that are not otherwise protected - railway and road fields, remnants of the Pece valley - but which of some landscape and nature conservation importance, habitats and animal species, mainly birds, are also mentioned in the analysis.

5.7.2. Principle and objectives of the landscape and nature conservation assessment

The purpose of the surveys is to assess the biota of the study area and the estimated general biogeographic impact area, to carry out landscape and conservation analyses, and to establish a baseline status from a general biogeographic point of view and an analytical assessment of the likely impacts.

The data collected during the studies focused on a general description of the natural and semi-natural habitats and their biota in the directly affected area and the indirectly affected area of influence, the presence of species of special interest (protected or rare species, species on which the designation of sites of European Community importance for nature conservation in the area is based) and an estimate of their impact. A primary consideration was the identification of habitats and species likely to be affected by the activities in the planning area. For areas in the vicinity of the proposed plant site that are not directly affected, elements of landscape and nature conservation importance were also the object of analysis.

5.7.3. The methodology under review

During the field observations carried out in the framework of the study, in accordance with general scientific and conservation practice, the preliminary classification and assessment of the sites concerned from a wildlife conservation point of view was primarily based on the examination of habitats and vegetation, supplemented by monitoring data on fauna. The defining characteristics of the habitats and vegetation of the study area were defined on the basis of the condition of the autumn and spring aspects. The site visits in November 2023 and April 2024 focused the identification of specific recognisable habitat types, with an emphasis on documenting vegetation-habitat characteristics and characteristic species. Topographic maps and satellite imagery *(Google Earth)* were used as background material to assist in the fieldwork to delineate the area and habitats.

For the landscape and conservation characteristics of the habitats in the study area, the following criteria were used account:

- naturalness,
- coverage,
- the extent of the anthropogenic impact,
- risk factors,
- biological activity value.

The fauna of the planning area and the indirect impact area was surveyed using standard, easily applicable sampling methods in addition to individual observations made during the field survey of a group of animals, mainly arthropods.

In addition to comparisons of species assemblages, the survey of the sites concerned focused on taxa under conservation protection (protected and specially protected species and taxa listed in international conventions). The results are evaluated and used in accordance with the provisions of *Decree 100/2012 (IX. 28.) of the Ministry of Agriculture and Forestry of the Republic of Hungary Decree 13/2001 (V. 9.) of the Ministry of Agriculture and Forestry of the Republic of Hungary on protected and specially protected plant and animal species, the scope of specially protected caves and the publication of plant and animal species of conservation importance in the European Community and Decree 43/2010 (IV. 23.) of the Ministry of Agriculture and Forestry of the Republic of Hungary on plant protection activities.*

and the provisions of the *European Community's Nature Directives (Council Directive 79/409/EEC on the conservation of wild birds, Birds Directive; Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora, Habitats Directive, Bern Convention (1990/7 International Treaty of the Minister of the Environment, Convention on the Conservation of European Wildlife and Natural Habitats).*

5.7.4. Landscape and nature conservation findings of the study

5.7.4.1. General natural features and vegetation of the study area

The botanical classification of the habitats affected by the change of land use and the relevant findings are based primarily on the likely natural state and the original state prior to the project, and on the comparison with the areas in the wider environment that are not affected by the activity.

On properties that have been intensively farmed for many decades in and around the planning area, the vegetation has been dominated by the land use that prevailed before and after the industrial zoningThe planning site itself was also a long-standing ploughed property. The relatively high altitude (130 mbf), loess plateau character of the area has seen radical changes in the land and its surroundings after the industrial zoning. While the original small and medium-scale arable cultivation in the surrounding area of the planning area has remained, the industrialisation and the activities related to the construction of the BMW factory and the infrastructure already in place have completely changed the natural state and the landscape structure of the ~500 ha area. Planned green spaces are being created in the unpaved and unbuilt spaces between the industrial properties and the infrastructure elements. Although these will eventually contain elements of the natural plant communities typical of the area, the regular mechanical treatment that is expected will not allow for the maintenance of plant communities with a greater diversity in the long term. The Tócó valley, which is of great conservation importance and is mainly located to the east, will be affected by the changes that will take place, at most only very indirectly from a botanical point of view, due to the isolating effect of the intervening agricultural land, roads and other urbanised areas, and the influx of natural vegetation from these areas is unlikely. The Pece valley (Figure 24), which starts more than 1 km from the south-western corner of the planning area, will also be unaffected by the indirect effects of the planned plant, if it is operating normally, due to the separating effect of the BMW plant and the service road that circles the plant site. The vegetation of the heavily silted and long-drained riverbed has long lost its natural character under the strong effects of chronic desiccation and agrochemicals, and is of little botanical significance.

24. Figure 1: The dried out, heavily weedy, patchy remnant of the Pece Lake, with its closed reedbeds, as the only area of the wider planning area with some natural character.

The fact that the planning area and its surroundings were originally and still are completely devoid of semi-natural habitats and thus of natural vegetation is due to the persistent and very intensive impact of the anthropogenic factors detailed above. The habitat of the area, which was previously predominantly used as arable land and was not then covered by habitats of high conservation value and was mainly affected for feeding and migration purposes, has been further negatively affected by industrial and transport investments in recent years. Plant species or communities that require stable habitat conditions are unable to survive even in the narrow field margins between plough fields, due to ploughing and the drift of agrochemicals. There are no areas of botanical value within at least 5 km of the planning area. One such area is the Tócó Valley to the east, towards which the M35 motorway and the 35 motorway form a barrier to expansion. Given the situation of the study area as described above, there therefore no suitable habitat conditions for natural vegetation either within the estimated general wildlife protection area in the wider area. In the arable and set-aside habitats the west and north of the site, which are at most exceptionally and rather indirectly exposed to the expected impacts, as well as on similarly used surfaces in the area, there is a strong degradation due to increasing stress and chronic moisture deficit. The unpaved and uncultivated surfaces of urbanised habitats and trail facilities are defined by ruderal or other weedy vegetation and predominantly by a weakening landscape of alien woody vegetation, with scattered stands of pedunculate oak, native ash and elm species, and some native poplar, as well as birch, wild rose and black elder in lower elevations and on edges. The fields of recently constructed or under construction roads near the planning area are either exclusively covered with annual weed flora or are still completely bare. Secondary habitats created by future revegetation and landscaping in the plant area could provide habitat for urbanised, disturbance-tolerant species.

The ploughed fields in the area of influence are not considered to be habitats for species of conservation importance in this area due to the land use that is typical of them. Due to the permanent heavy use of these habitats, they have practically no conservation value. At most, in periods of prolonged rainfall and short periods of no cultivation, mud plants of floristic value may appear on the waterlogged, bare patches.

The dry and largely ploughed up remnant of the Pece Marsh, which is not within the estimated general wildlife area of conservation, but close to it, is the only area in the area that still retains some natural features. In the upper part of the stream, closer to the proposed plant, the bedrock has also almost completely disappeared and has been ploughed up many decades ago. In the lower part of the river, the riverbed is still preserved as a 30-40 m wide strip, but the banks are heavily ploughed, with no woody shrub vegetation or other shelter zones. There is a high level of chemical pollution from the surrounding fields, which has caused extensive degradation of the vegetation. The observed diversity and naturalness of the vegetation is low, which is certainly due to the degradation effects of pesticides inputs, in addition to chronic drying. The highly homogenised and impoverished herbaceous flora, dominated by the common reed canarygrass *(Calamagrostis epigeios), which* is found in similar habitats in the region, is relatively rare here, but there are patches of nettle *(Urtica dioica),* field asparagus *(Cirsium arvense)* and in some places a large cover of ash blackberry *(Rubus ceasius)* in the wetter areas. In the deeper parts, obviously flooded and somewhat better watered during the wetter periods, there is a dense, fully enclosed stand of reed *(Phragmites australis)* and small patches of invasive Canadian goldenseal *(Solidago canadensis).* Along canals and in ore residues, the common horsetail *(Amorpha fruticosa)* is very common in the area, being restricted to small stands. In the nutrient-enriched beds closer to the railway, in addition to the weeds already mentioned, spotted knapweed *(Conium maculatum),* burdock *(Arctium sp.)* and roadside thistle *(Carduus acanthoides)* are typical. In the drier areas along the banks, the invasive species narrow-leaved silver fir *(Eleagnus angustifolia)* is widespread, but only scattered specimens have survived due to ploughing. In the widening part of the upper part of the riverbed, which has not yet been ploughed, degraded meadow vegetation remains. The vegetation in this grassland patch is also rather featureless and of low diversity. Small patches of terrestrial reed are present and typical species of semi-arid degraded grassland such as *Elymus repens, Ambrosia artemisiifolia, Anchusa officinalis* are more dominant*, Apera spica- venti, Bromus inermis, Bromus mollis, Bromus tectorum, Erodium cicutarium, Eryngium campestre, Picris hieracioides, Tragopogon dubius* and *Cirsium arvense* in weedy patches. The former species are dominant in the stabilized stand, but the associations have lost their character due to prolonged drying and weed species are dominating (Figure 24).

The formerly intensive arable land directly affected by the project and unpaved, trampled or occasionally treated surfaces around the BMW factory under construction are dominated by other disturbance-tolerant annual weed species in addition to the weed flora accompanying the former cultivated crops. The most typical are the broad-tolerant bush and ruderal species resistant to pesticides and permanent human disturbance of the habitat. The most abundant weed species that are intermittent are those that occur in masses and sometimes form closed stands, such as roadside thistle (*Carduus acanthoides*), medical somnip *(Meliotus officinalis*), wall goosefoot *(Chenopodium urbicum),* wild carrot *(Daucus carota)* and spotted knapweed *(Conium maculatum).* Along recently established unpaved paths and ditches, there is some masses of paraye grass *(Rumex patientia).*

On the wide road and railway field leading to Balmazújváros, which is at most exposed to exceptional habitat impacts, planted groups of trees, solitary trees and shrubs can be found in a mosaic with grass patches, which differ significantly from the natural state in their species composition. No significant botanical value is expected in these areas from a conservation point of view. These stands of trees, established for conservation purposes but dying as a result of drought, are of landscape rather than nature conservation importance. In this section, too, there are frequent instances of plantation

Turkestan elm *(Ulmus pumila)*, the American ash (*Fraxinus pennsylvanica),* known as a spontaneously spreading invasive species, the green sheep *(Acer negundo)*, but also the white poplar *(Populus alba)*, planted poplar hybrids (*Populus x canadensis*), as well as acacia (*Robinia pseudacacia)*, silverwood (*Eleagnus angustifolia), alianthus glandulosa* and strawberry *(Morus sp.,*Trees that can be considered as valuable are the considerable size of *Populus nigra 'Italica'*, *Quercus robur (Quercus robur), Fraxinus angustifolia pannonica (Fraxinus angustifolia pannonica*) or *Fraxinus excelsior (Fraxinus excelsior).* Cherry plum *(Prunus cerasifera)* is very common on the edges and lower levels, but wild rose *(Rosa sp.),* stonecrop *(Prunus spinosa)* and black elder *(Sambucus nigra) are* also present. Tree and shrub species are completely absent in the perimeter and in the planning area. Even the rapidly spreading invasive woody species mentioned above are absent due to the high pressure on the area, as the processes resulting from human activities have completely eradicated all species typical of a stable state.

Under current conditions, the permanent establishment of protected or particularly valuable plant species or plant communities in the planning area and its immediate surroundings can be ruled out.

The area of influence does not preserve habitats in a semi-natural state typical of the region, and there are no traces of natural vegetation. The types of vegetation that can be categorised according to the General National Habitat Classification System are present in the boundary area and , while the vegetation types found in the wider environment are of no conservation importance. The types T1 - Annual large-scale arable crops, U4 - Sites, junkyards and landfills, U11 - Road and rail network, which can be identified within the planning area and the estimated general habitat conservation catchment area, are of no conservation importance. The more remote, more stabilised vegetation habitats are located several kilometres away from the road and railway , and their potential impact is limited to exceptional situations, but
As discussed in Section 4.14.2, significant impacts beyond the site boundary are unlikely. For this reason, detailed analysis of these mainly wooded, scrubby patches is not considered justified. The latter types are OC - Uncharacteristic dry or semi-dry grassland and tall fescue (highly degraded along the Pece River), OF - Tall fescue ruderal weed vegetation, S7 - Tree groups, woodland strips and tree belts (wooded areas).

In conclusion, human activity in and around the area to be developed has already permanently altered the vegetation structure in previous decades. Plant communities typical of natural forests and grasslands in the area have disappeared. No species or associations of plants of conservation or special conservation interest have been found or are known to occur in the study area or in the estimated general area of wildlife conservation.

5.7.4.2. Zoological classification of the study area and the catchment area

There are no semi-natural habitats in the study area where a higher diversity of fauna can be expected to persist. In the originally intensive fields, only very small assemblages of species and individuals could have existed, which were able to tolerate agro-technology. These include a few species of ground-dwelling spiders and ground beetles, as well as phytophagous species living on crops and classified as pests. With the conversion of the site into a building site and its subsequent development as an industrial area, the conditions for fauna may be improved to some extent, at most by the landscaping of green areas, although no greater diversity of assemblages can be expected. The planning area and its surroundings, as in habitats within the estimated general area of conservation, the fauna structure has been entirely shaped by direct or indirect human impact, due to decades of use of these areas. In the study area and its wider surroundings of at least one and a half kilometres, there are no habitat conditions, even in patches, that could be relevant as animal habitats. In the more distant roadside strip described above, the scrubby tree stands, which are indirectly affected by indirect impacts at most in the event of a major incident or disturbance, provide habitat for low numbers of species that are common in the area. Even in the less intensively used areas in and around the planned plant, the potential habitat conditions are not fulfilled. The spider and beetle species, which are not present in a high abundance in bush habitats and are typical of terrestrial invertebrates, are of no conservation importance. There are no bird habitats or breeding sites in the area of influence. The dry remnant of the Pece Vein and the remote wooded scrub roadside strips are of rather limited suitability as bird habitats, and are more likely to be occupied temporarily by small, common species of woodland and scrub habitats and by the more common species of highland reed and reed canary grassland.

Generally speaking, for fauna, habitats modified by human activity, regular or permanent human presence and associated disturbance determine the maintenance of essentially unfavourable living conditions in the affected habitats.

As explained above, the most likely and potentially affected tree stands and woody-shrub patches, which are not in a good natural state, are likely to be inhabited by birds that are common in the area. Birds breeding in this area may also temporarily occur in the area of influence as transient fly-overs and occasional feeders. The typical species include some protected species, but they are widespread and common even in urban habitats. Breeding populations in wide habitats are unlikely to be significant. The more important protected species typical of the grasslands of the area do not find habitat in the current state of the boundary. The permanent establishment of species of special conservation interest in grassland patches, field margins and woody shrub habitats is unlikely. Potentially, in exceptional situations, woody-shrub, tall fescue or scrub habitats may be occupied by bird species that are common, especially in human habitats: Eurasian collared dove (*Columba palumbens*), Balkan pigeon (*Srteptopelia decaocto*), black thrush (*Turdus merula*), song thrush (*Turdus philomelos*), house sparrow *(Passer domesticus)*, field sparrow *(Passer montanus),* Common Bunting (*Sylvia communis*), Thorn-backed Sparrow (*Lanius corullio*), Magpie (*Pica pica*), Common Tengelic (*Carduelis carduelis*), Yellow Wagtail *(Motacilla flava),* Fieldfare *(Alauda arvensis),* Wheatear *(Galerida cristata).*

Depending on the pace of the works, it is foreseeable that a number of temporary habitats may be created during the works, such as smaller larger pits that create waterlogged wetland habitats during wet weather. Mounds of earth and excessively steep embankments may be suitable for the breeding of cavity-nesting birds (shore swallows, gyrfalcons). Bird colonisation can be prevented by covering steep banks that remain open for long periods during the breeding season. Steeper than 45º, there is a risk that hollow-roosting birds may colonise. If, for any reason, the gradual harrowing of the slope does not take place at this angle and the species of ratites become established, provision shall be made for their protection. In the latter case, the nature conservation authority may suspend work on the sites concerned until the end of the breeding season. In this case, within 10 to 10 metres of the nesting sites, from the start of the breeding season until the end of the breeding season

- between 15 April and 15 August - no excavation or covering work may be carried out. Once the plant has been built, the presence of the smoke flycatcher *(Hirundo rustica)* and the presence of the miller's swallow on the buildings cannot be excluded.

(Delichon urbica) may also breed. If there is a problem with the colonisation of swallows, the relocation of nests, if necessary, can only be carried out with the permission of the nature conservation authority of the area, as provided for in Act LIII of 1996.

Among mammals, small mammals are most likely to be present on grassy field margins and the edges of tree stands. The field sow (*Microtus arvalis*) and the field shrew (*Crocidura suaveolens*) are found. The presence of the protected mole (*Talpa europaea*) can also be expected in the wider field margins. There may also be temporary occurrences of ferrets (*Mustela putorius*), weasels (*Mustela nivalis*) and martens *(Martes foina),* as well as the presence of ubiquitous species of huntable mammals such as the brown hare (*Lepus europaeus*), fox (*Vulpes vulpes*) and roe deer (*Capreolus capreolus*). The habitats affected by the plant construction works and the technology used in its operation are of minor importance for these mammals, and therefore the plant is not expected to have a negative impact on the conservation of this group of species of high conservation importance. Bats are unlikely to move into the buildings during operation. In such a case, the problem should be resolved with the involvement of the conservation manager.

To summarise the impacts on fauna, it can be concluded that the conservation impact of a small number of species that are widespread and occur in the study area and the estimated general wildlife conservation area is not relevant.

5.8. Protection of artificial elements

In the immediate vicinity of the facility, there are general economic areas associated with agricultural and industrial activities. A preliminary archaeological documentation was prepared for the planning area as a first step in the context of the "Debrecen North-West Economic Belt - Development of a supplier park of approx. 100 ha and the internal infrastructure supplying it, as well as the t-2 stormwater reservoir" (work no. 404711, 26 May 2022), which is an ERD I. In a second step, ERD II (work number 405476, 13 July 2023) was preparedfocusing on the planning area of the present investment. The information contained therein is summarised below. The two archaeological files are attached in full as Annex 1.9 to this document.

The site of the planned investment is located in Hajdú-Bihar County, outside Debrecen, between the settlements of Kismacs and Nagymacs, on the north-western side of the North-Western Economic Belt, and the area affected by the change is 45 ha. The area affected by the change has been the subject of several archaeological excavations by the Déri Museum and the National Archaeological Institute of the Hungarian National Museum. In June 2018, Déri Museum staff carried out a field survey in the area under investigation during the preparatory works of the Debrecen North-Western Economic Belt. A
In the framework of the project "Construction of infrastructure and utility lines for the supply of Debrecen, North-Western Economic Belt", a preliminary archaeological documentation based on the results of geophysical survey and test excavation was prepared on 25 June 2019. The full surface excavation of the infrastructure development trail proposed in the preliminary archaeological documentation was carried out by the Déri Museum in 2019. On 19 April 2019, a preliminary archaeological documentation based on the results of geophysical survey and test excavation was prepared for the project "Debrecen North-West Economic Zone 15 ha Northern Extension Area". The project "Debrecen North-Western Economic Zone - approx. 100 ha of the Supply Park and internal infrastructure and T-2

on 26 May 2022, a preliminary archaeological documentation based on the results of a field survey and geophysical measurements was carried out in the framework of the project "Construction of a stormwater reservoir". Data were collected from the public register of archaeological sites, museum archives, literature and cartographic research, in the area and 200 m wide zone of the proposed project, for 3 known (recorded) archaeological sites.

29. Table 1: Archaeological sites identified during the archaeological assessment within 200 m of the project

Name	Registration Number	Source of information	Where to find nature of	Age of the site	Position of
Debrecen-Rózsa-dűlő	58424	site inspection, excavation trial excavation geophysical measurement trial excavation full surface excavation	Surface teleprom settlement settlement skeletal cemetery	Neolithic Sarmatian cheetah, new age Sarmatian	concerned
Debrecen-Mács-puszta I.	99187	geophysical measurement	colonial phenomena	Migration of people age	concerned
Debrecen-Mács-puszta II.	99189	geophysical measurement	colonial phenomena	Migration of people age	concerned

5.9. Description and characterisation of the activities of establishments dealing with hazardous substances in the vicinity of the installation site, and possible links with them (in particular technological, utility and service links)

According to the data issued by the Hajdú-Bihar Vámegyei Katastrofavédelmi Directorate under the registration number 35900/3455-1/2024.pseud., there are several hazardous substances plants and plants below the threshold level in the municipality. Of the listed plants, the TEVA Pharmaceuticals Ltd. and the "Crystal-99" Environmental Management and Services Ltd. have a protection as indicated in the regulatory plan. The protection zones are limited to the wider surroundings of the installations, which are not close to the proposed site of Eve Power Hungary Ltd. The closest plant to the site, which has a disaster prevention permit, is the site of BMW Manufacturing Hungary Kft.

1. TEVA Gyógyszergyár Zrt.: 4042 Debrecen, Pallagi út 13. Classification: upper threshold hazardous substances plant. Activity: production of active pharmaceutical ingredients, production and packaging of pharmaceutical preparations and generic pharmaceutical research. Hazardous substances: The pharmaceutical plant may contain large quantities of flammable liquids (methanol, ethanol, etc.) and substances hazardous to the aquatic environment. Smaller quantities of toxic substances, typically in solid form, and flammable gases (propane-butane, acetylene) in small (cylinder) containers may be present. Distance from the Eve Power Hungary Kft. site (as the crow flies): approx. 18 km.
2. "Kristály-99" Environmental Management, Services Ltd. Debrecen, 15007 - plant dealing with hazardous substances of lower threshold level Activity. Distance from the site of Eve Power Hungary Kft. (as the crow flies): approx. 10 km.
3. BMW Manufacturing Hungary Kft., 4002 Debrecen, BMW körút 1. Classification: plant below threshold. Scope of activity: Motor vehicle manufacturing plant. The site will be used for the production of electrically powered passenger cars, including the installation of a paint shop

happened. The emergency authorisation of the facility is justified by the storage of materials to be used in the painting plant and the storage of air conditioning gas to be used in the cooling system of motor vehicles, among other things. Distance from Eve Power Hungary Kft: approx. 30 m

Taking into account the location of the hazardous plants and the extent of the protection zones, the impact on the planning area can be excluded.

According to the above-mentioned information, ECOPRO GLOBAL HUNGARY Zrt. and Contemporary Amperex Technology Hungary Kft. are currently still in the construction phase, and only have a disaster management permit required for a building permit. The disaster management permit procedure for hazardous activities will be carried out at a later stage.

BMW Manufacturing Hungary Kft. has been granted a hazardous activity permit. The industrial safety classification of the facility is a sub-threshold hazardous plant. The industrial safety protection zone of the facility does not extend beyond the site boundary of the facility.

SEMCORP Hungary Kft. has been classified as a plant dealing with hazardous substances on the basis of the data provided by the Hajdú-Bihar Vámegyei Katastrofavédelmi Directorate.

The safety documentation for establishments dealing with dangerous substances and for establishments below the threshold value is available at the Mayor's Office of the municipality concerned (in some cases on the Office's website). The location of the establishments assessed as relevant and listed above is shown in the figure below.

25. Figure 1: Hazardous substances plants and plants below threshold in the city of Debrecen

The facility will not have any technological or utility links with other hazardous materials facilities. A service/supplier connection with the adjacent BMW site is planned under the supplier agreement, but this service connection has no relevance to industrial safety.

The utility supply to the facility will be implemented as part of the development of the industrial park. The planned utility supply of the facility can be summarised as follows, based on the declaration issued by the City of Debrecen.

30. Table 3: Expected availability of utility demand and provided capacities

Utility	Capacity	The deadline for undertaking the construction of utilities is set in the Government Decision according to the deed of support issued on the basis of
Electricity	2,5 MVA 105 MVA	From 29.09.2024 for 1 year expected 31.12.2027.
Gas	8 000 m^3/h	available
Drinking water	4 m^3/h 79 m^3/day	expected 31.12.2024.
Urban waste water	3 m^3/h 68.14 m^3/day	
Industrial dilution water	55,3 m^3/h 585,112 m^3/day	expected 31.12.2026
Grey water	160 m^3/h 2 981,78 m^3/day	
Technology industry Waste water	73,4 m^3/h 1 336,87 m^3/day	

As shown in Table 30, the natural gas supply to the site is already secured, while the other utility connections are planned to be completed on schedule. It should be noted here that the water supply for the construction activity is already provided through a temporary connection, and that the electricity supply for the construction activity is also being provided through the installation of a temporary transformer.

Based on the data provided by the applicant, the actual electricity demand during the period of operation is as follows will be less than the value specified.

5.10. Noise protection

The facility under investigation is located on the outskirts of the town of Debrecen. The zoning plan of the area (https://debrecen- megyei-jogu-varos-szabalyozasi-terv.envimap.hu/) classifies the area as Gá-Ip - general economic area related to industrial activity. Its wider surroundings are classified as Má and Köu - general agricultural area and road area in the north and west, Köu - road area and Gip - industrial area in the south, and Gá-Ip - general economic area with industrial activity in the east. Article 2 of Government Decree 284/2007 (X. 29.)
(q), the noise classification of the buildings to be protected is "Residential (rural, suburban)" and "Commercial".

Environmental noise measurements were carried out in relation to the installation on 20-21 June 2024 and 15-16 October 2024.

The house numbers, zoning classification and distance (as the crow flies) from the study area of the closest buildings to be protected are summarised in the table below:

31. Table 2: Points closest to the study area during noise measurements on 20-21 June 2024

Town/Street	Zoning classification	House number/hrs	From (centre of) the area tested distance [m]
Debrecen-Józsa, Elek u.	Lke - suburban residential area	213. b.	~ 1800
Debrecen-Kismacs, Sunflower u.	Lf - rural residential area	33.	~ 3300
Debrecen-Nagymacs, Nagyhát u.	Lf - rural residential area	38.	~ 2100
Debrecen, suburb Péterfiadűlő	Ev - protection forest zone	Parcel 0263/10.	~ 2300
Debrecen, outskirts Sightseeing tavern.	Kb-Rek - special, other, non-building recreational area	parcel 0316/58.	~ 2700
Debrecen, Suburb, Ágnes tanya	Má - general agricultural area	0237/258	~ 1750

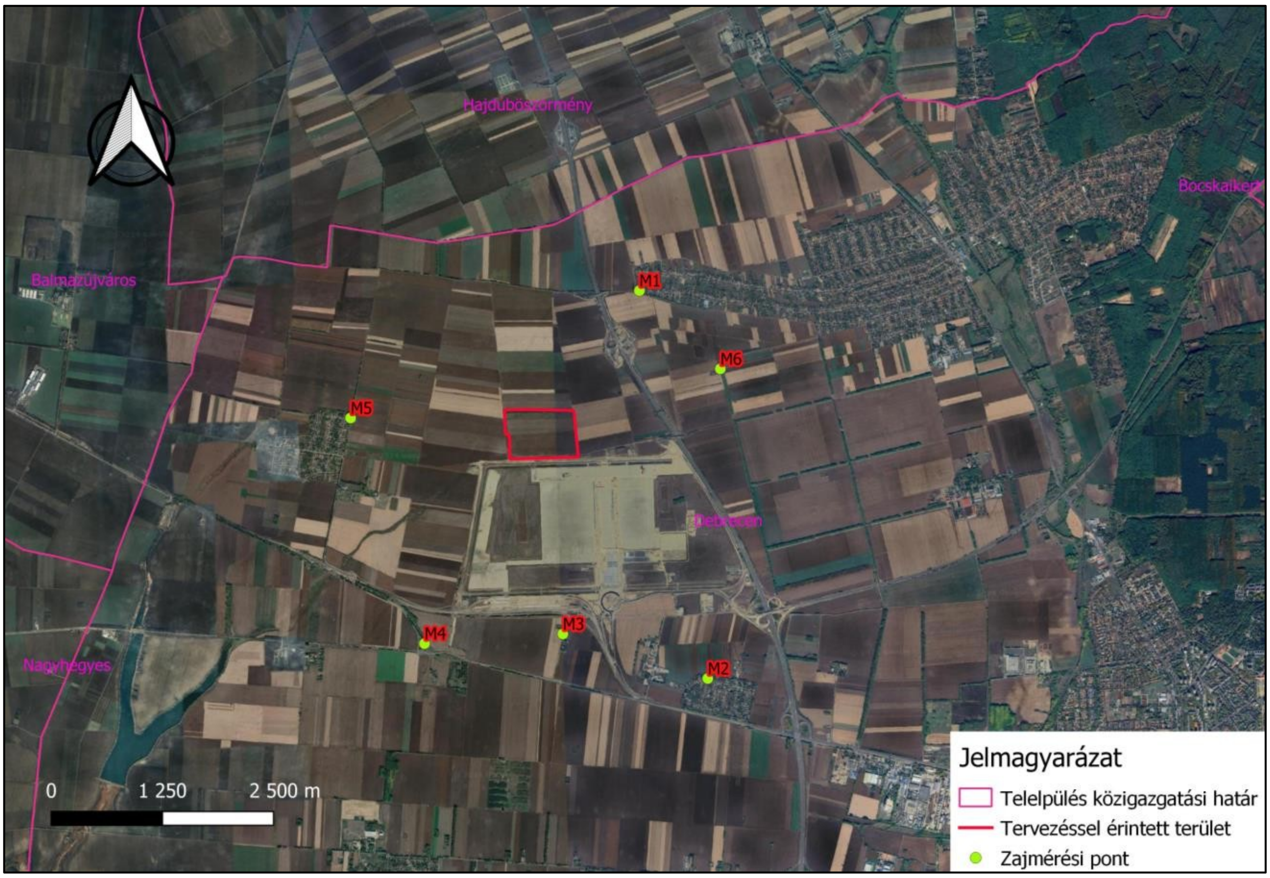
32. Table 2: Noise measurement point location s during the noise measurement on 20-21 June 2024

Point sign	Located at	Height	Nature of point
M1	Debrecen-Józsa, Elek u. 213. b. in the line of the fence of the residential building to be protected	1,5 m	ZT
M2	Debrecen-Kismacs, Napraforgó u. 33. residential building to be protected fence on line	1,5 m	ZT
M3	Debrecen, outskirts Péterfiadűlő residential building to be protected (0263/10 nrsz.) on the fence line	1,5 m	ZT
M4	Debrecen, outskirts Látóképi csárda, Látókép u. (0316/8 hrsz.) site boundary	1,5 m	ZT
M5	Debrecen-Nagymacs, Nagyhát u. 38. residential building to be protected fence on line	1,5 m	ZT
M6	Debrecen, outskirts Ágnes farm (0237/258) at the entrance	1,5 m	ZT

The noise measurement was carried out in accordance with the purpose of the study, according to the requirements of MSZ 18150-1, Chapter 6, using the following method: where noise of industrial origin was detected in a residential area to be protected, the equivalent A-weighted sound pressure level of the noise $_{LAeq}$ was measured during breaks in other environmental noise (traffic, barking of dogs, etc.). The measured value was corrected for the background noise and the $_{LAM}$ assessment level of the operational noise was determined. No noise exposure from the plant was measured in the study area, either during the day or at night.

Where no operational noise was detected or where the operational noise exposure could not be determined, the background noise exposure was determined using the $_{LA95}$ 95% A-weighted sound pressure level.

During the test, measurements were taken at each point until the change in $_{LAeq}$ level remained within 0.1 dB. The background noise in the area was measured during the intermission of noise sources (traffic, other noise) in the immediate environment.



26. Figure 1: Location of noise measurement points during the noise measurement on 20-21 June 2024

At all measurement points, traffic on the border roads was audible during the day. With the exception of the M5 measurement point, noise from traffic was audible at all other measurement points, with the exception of the M35 motorway and the M33 secondary road.

33. Table 1 95% A-weighted sound pressure levels for background noise during noise measurements on 20-21 June 2024

Measurement point Jele	LA95 dB	
	Days	at night
M1	40,0	37,8
M2	41,0	39,8
M3	38,9	37,0
M4	40,1	40,0
M5	34,2	33,1
M6	38,0	37,0

At the measurement points (M1-M4), the dominant noise component during the day and night was entirely from traffic. No operational noise was audible or measurable in the study area.

During the noise survey carried out on 15-16 October 2024, the parcel number and zoning classification of the closest building to the study area and its distance (as the crow flies) from the study area are summarised in the table below.

34. Table 1: Building to be protected closest to the study area (noise measurement 15-16 October 2024)

Town/Street	House number/hrs	Distance from the area under test (centre) [m]
Debrecen-Nagymacs	-/0292/1. hrsz.	~ 1550

Noise measurements carried out on 15-16 October 2024 from the nearest facades of the buildings to be protected
A measurement point was taken at 2 m. The location of the measurement point is shown in the figure below:

27. Figure 1: Off-site measurement points during the noise measurement on 15-16 October 2024

The exact location of the measurement point is summarised in the table below:

35. Table 1 Exact location of the measurement points during the noise measurement on 15-16 October 2024

Point sign	Located at	Height	Point nature of
101	Debrecen-Nagymacs 0292/1. on the border of the area to be protected	1,5 m	ZT

ZT: Noise exposure point

The noise measurement was carried out in accordance with the purpose of the study, according to the requirements of MSZ 18150-1, Chapter 6, using the following method: where noise of industrial origin was detected in a residential area to be protected, the equivalent A-weighted sound pressure level of the noise $_{LAeq}$ was measured during breaks in other environmental noise (traffic, barking of dogs, etc.). The measured value is given in corrected for background noise and determined the $_{LAM}$ assessment level for operational noise. No noise exposure from the plant was measured in the study area, neither during the day nor at night.

Where no operational noise was detected or where the operational noise exposure could not be determined, the background noise exposure was determined using the $_{LA95}$ 95% A-weighted sound pressure level.

During the test, the measurement was performed until the change in $_{LAeq}$ level remained within 0.1 dB. The background noise in the area was measured during the intermission of noise sources (traffic, other noise) in the immediate environment.

The results of the noise measurements are shown in the table below.

36. Table 1: Results of the noise measurement carried out on 15-16 October 2024

Measurement point	**$_{L95}$ dB(A)**	
Jele	**Days**	**at night**
101	35,5	32,1

No operating noise was heard at the measurement point. Construction noise was audible at the measurement point the daytime.

During the measurements, noise from traffic was audible at points M1, M2, M3, M4, M6, which is the noise pollution from the M35 motorway and the secondary road 33. The M5 measurement point was an exception.

No operating noise was heard or measured at the measurement points.

Traffic noise measurements were not carried out for the project. The noise measurement

reports are attached in Annex 1.7.

5.11. Transport

Passenger vehicle traffic is expected to come from Debrecen and the surrounding settlements. The traffic generated will be congested on the M35 motorway, the northern access road (between M35 motorway and the BMW körút), the BMW körút, the 33 main road and the 354 road.

28. Figure 1: Roads in the vicinity of the installation

Given the recent development the industrial park's transport infrastructure, the availability of publicly available traffic data is limited.

the M35 motorway, the 33 motorway and the 354 road, the "NATIONAL PUBLIC TRANSPORT 2022
A publicly available study entitled "THE FORM OF THE COMPETITION[3]" has been used to gather traffic data.

- On the northern section of the M35 motorway, the counting station code is 3790.
- On the southern section of the M35 motorway, the counting station code is 3527.
- On the main road 33, the code of the counting station is 6571.
- On route 354, the counting station code is 3792.

Data from the preliminary study document (DEBRECEN NORTH-NEW-NYUGATI ECONOMIC LINK Widening and Infrastructure Improvement, Béla Lévai[4]) for the traffic work part of the Northern access road (between M35 motorway and BMW Boulevard) and sections of BMW Boulevard were used. In relation to these turnover data, it is important to underline that the year 2018 is taken as the

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[3] FORM OF THE NATIONAL PUBLIC TRANSPORT SCHEDULE FOR 2022, Ordering Party's subject number:VB-2023/0083419/00
Client's professional responsible: Lajos Janás, senior data banker; Contractor: One Planet Mérnökiroda Kft.; Publisher responsible: Gergely Nitsch, okl. transport engineer, managing director; Source: https://internet.kozut.hu/kozerdeku-adatok/orszagos-kozuti-adatbank/forgalomszamlalas/ [4] DEBRECE NORTH-NYUGATIC ECONOMIC ZONE FOR THE DESIGN OF THE TRANSPLACEMENT AND INFRASTRUCTURE TRANSFER, Béla Lévai,
Environmental Protection Engineer, Expert /Chamber of Commerce reg.: HBM MK 09-0036/. Date of documentation: 2018.12. 02.

and did not take into account the general development of traffic for the operational and long-term periods, the same daily traffic values were used for the two periods. To avoid this and to ensure consistency, a traffic forecast for 2022 has been made for these road sections, thus aligning the base year considered for all the road sections studied.

Traffic data are available for the M35 motorway, the 33 motorway and the 354 road, broken down vehicle type. For the Northern access road and sections of the BMW ring road, traffic data were provided in the above-mentioned preliminary study, classified by acoustic category.

To facilitate transparency, the basic and calculated data from the two different data sources are presented in separate tables below.

37. Table 1: Baseline traffic load on roads in the vicinity of the installation Part 1 (2022) [j/day]

Default state	M35 motorway north	M35 motorway south	Highway 33	Route 354
Passenger car	9427	9702	6440	5705
Small lorry	2328	2719	1624	696
Solo bus	60	38	188	18
Articulated bus	0	4	5	1
Moderately difficult truck	214	129	81	97
Heavy goods vehicle	277	668	110	113
Trailer truck	135	125	53	53
Semi-trailer coupling	2102	1795	128	382
Special	20	16	1	19
Motorcycle	30	53	110	78

38. Table 2: Baseline traffic load on roads in the vicinity of the installation Part 2 (2022) [j/day]

Default state	North Connecting	BMW Boulevard North	BMW Boulevard East	BMW Boulevard West	BMW Boulevard South
Acoustic category I.	477	872	131	530	1090
Acoustic category II.	404	38	182	18	1139
Acoustic category III.	3294	35	2195	9	2333

During the construction period, the M35 motorway, the Northern access road and the BMW bypass are expected to be affected. The estimated distribution of the traffic generated is detailed in section 5.11.1. During the operational period, the Investor will transfer the finished product to the BMW car plant located on the opposite side of the BMW Boulevard at a rate of 20 tgk/d. This stock will be exclusively on the northern section of BMW Boulevard. The remaining freight traffic will access the facility from the M35 motorway. It is expected that the passenger car and bus traffic generated during the operational period will be split between the different directions. The estimated distribution of traffic generated is detailed in section 5.11.2.

The most significant traffic-generating phase of the construction works is expected to take place in 2025, with the start of operations expected in 2027, according to the investor's data. Accordingly, the forecast baseline traffic for the years under consideration is as follows.

The traffic forecast was made taking into account the road regulations ÚT 2-1.118:2005 and e-ÚT 02.01.21:2009.

39. Table 1: Baseline traffic on the roads under study during the construction period Part 1 (2025) [j/day]

	M35 motorway north	M35 motorway south	Highway 33	Route 354
Passenger car	10087	10381	6826	6047
Small lorry	2491	2909	1721	738
Solo bus	63	40	190	18
Articulated bus	0	4	5	1
Moderately difficult truck	231	139	87	103
Heavy goods vehicle	299	721	119	120
Trailer truck	146	135	57	56
Semi-trailer coupling	2270	1939	138	405
Special	22	17	1	20
Motorcycle	31	55	111	79

40. Table 1: Baseline traffic on the roads under study during the construction period Part 2 (2025) [j/day]

	North Connecting	BMW Boulevard North	BMW Boulevard East	BMW Boulevard West	BMW Boulevard South
Acoustic category I.	506	924	139	562	1155
Acoustic category II.	408	39	184	18	1151
Acoustic category III.	3492	37	2326	9	2473

41. Table 1: Baseline traffic on the roads under study during the operational period Part 1 (2027) [j/day]

	M35 motorway north	M35 motorway south	Highway 33	Route 354
Passenger car	10464	10769	7084	6218
Small lorry	2584	3018	1786	759
Solo bus	65	41	192	18
Articulated bus	0	4	5	1
Moderately difficult truck	242	146	92	107
Heavy goods vehicle	313	755	124	124
Trailer truck	153	141	60	58
Semi-trailer coupling	2375	2028	145	420
Special	23	18	1	21
Motorcycle	32	56	111	79

42. Table 2: Baseline traffic on the roads under study during the operational period Part 2 (2027) [j/day]

	North Connecting	BMW Boulevard North	BMW Boulevard East	BMW Boulevard West	BMW Boulevard South
Acoustic category I.	520	950	143	577	1188
Acoustic category II.	408	39	184	18	1151
Acoustic category III.	3623	38	2414	10	2566

43. Table 1: Baseline traffic on the roads under study in the long term Part 1 (2042) [j/day]

	M35 motorway north	M35 motorway south	Highway 33	Route 354
Passenger car	13763	14165	8179	7131
Small lorry	3399	3970	2062	870
Solo bus	82	52	233	18
Articulated bus	0	5	6	1
Moderately difficult truck	304	183	136	145
Heavy goods vehicle	393	949	185	168
Trailer truck	192	178	89	79
Semi-trailer coupling	2985	2549	215	569
Special	28	23	2	28
Motorcycle	32	57	69	51

44. Table 2: Baseline traffic on the roads under study in the long term Part 2 (2042) [j/day]

	North Connecting	BMW Boulevard North	BMW Boulevard East	BMW Boulevard West	BMW Boulevard South
Acoustic category I.	597	1090	164	662	1363
Acoustic category II.	408	39	184	18	1151
Acoustic category III.	4908	51	3270	13	3476

5.11.1. Expected traffic during the construction phase

The expected incremental traffic volumes on the affected road sections are as follows:

45. Table 1: Expected traffic load on national roads in the vicinity of the installation during the construction phase Part 1 (2025) [j/day]

	M35 motorway north	M35 motorway south	Highway 33	Route 354
Passenger car	10112	10396	6851	6057
Small lorry	2498	2914	1729	741
Solo bus	63	40	190	18
Articulated bus	0	4	5	1
Moderately difficult truck	231	139	87	103
Heavy goods vehicle	388	810	119	120
Trailer truck	146	135	57	56
Semi-trailer coupling	2270	1939	138	405
Special	22	17	1	20
Motorcycle	31	55	111	79

46. Table 1: Expected traffic load on national roads in the vicinity of the installation during the construction phase Part 2 (2025) [j/day]

	North Connecting	BMW Boulevard North	BMW Boulevard East	BMW Boulevard West	BMW Boulevard South
Acoustic category I.	539	1054	172	595	1188
Acoustic category II.	408	39	184	18	1151
Acoustic category III.	3581	215	2415	9	2562

Construction materials are expected to be delivered from the motorway direction, and therefore the expected freight traffic generated has been split between the two sections of the road under study. The access to the project area is possible directly from the BMW ring road, so the traffic generated will also be concentrated on certain sections of this road, as shown in the following tables.

47. Table 1: Distribution of excess traffic on the road section during the construction period Part 1 (2025)

	M35 motorway North	M35 motorway south	Highway 33	Route 354
Acoustic category I.	25%	15%	25%	10%
Acoustic category II.	25%	25%	0%	10%
Acoustic category III.	50%	50%	0%	0%

48. Table 2: Distribution of excess traffic on the road section during the construction period Part 2 (2025)

	North Connecting	BMW Boulevard North	BMW Boulevard East	BMW Boulevard West	BMW Boulevard South
Acoustic category I.	25%	100%	25%	25%	25%
Acoustic category II.	25%	100%	25%	25%	25%
Acoustic category III.	50%	100%	50%	0%	50%

In order to reduce congestion in residential areas, it is expected that the generated freight traffic will not affect Highway 33 and Route 354.

5.11.2. Expected traffic during the period of operation

The expected incremental traffic volumes on the affected road sections are as follows during the period of operation and in long term.

49. Table 1: Expected traffic load on national roads in the vicinity of the installation during the operational phase Part 1 (2027) [j/day]

	M35 motorway north	M35 motorway south	Highway 33	Route 354
Passenger car	10782	10960	7403	6346
Small lorry	2584	3018	1786	759
Solo bus	74	51	192	22
Articulated bus	0	4	5	1
Moderately difficult truck	242	146	92	107
Heavy goods vehicle	373	814	124	124
Trailer truck	153	141	60	58
Semi-trailer coupling	2375	2028	145	420
Special	23	18	1	21
	M35 motorway north	**M35 motorway south**	**Highway 33**	**Route 354**
Motorcycle	32	56	111	79

50. Table 1: Expected traffic load on national roads in the vicinity of the installation during the operational phase Part 2 (2027) [j/day]

	North Connecting	BMW Boulevard North	BMW Boulevard East	BMW Boulevard West	BMW Boulevard South
Acoustic category I.	839	2224	461	896	1507
Acoustic category II.	418	77	193	28	1160
Acoustic category III.	3683	208	2474	10	2626

51. Table 1: Expected traffic loads on national roads the vicinity of the installation in the long term Part 1 (2042) [j/day]

	M35 motorway north	M35 motorway south	Highway 33	Route 354
Passenger car	14082	14356	8497	7259
Small lorry	3399	3970	2062	870
Solo bus	91	61	233	22
Articulated bus	0	5	6	1
Moderately difficult truck	304	183	136	145
Heavy goods vehicle	453	1008	185	168
Trailer truck	192	178	89	79
Semi-trailer coupling	2985	2549	215	569
Special	28	23	2	28
Motorcycle	32	57	69	51

52. Table 2: Expected traffic congestion on national roads in the vicinity of the installation in the long term Part 2 (2042) [j/day]

	North Connecting	BMW Boulevard North	BMW Boulevard East	BMW Boulevard West	BMW Boulevard South
Acoustic category I.	915	2364	482	981	1681
Acoustic category II.	418	77	193	28	1160
Acoustic category III.	4968	221	3330	13	3536

A significant proportion of the materials and waste generated during operation are expected to be transported from the motorway, so the expected freight traffic generated has been split between the two sections of the route under consideration. Access to the project site is possible directly from the BMW ring road, so that the traffic generated will also be distributed over certain sections of this road as shown in the tables below.

53. Table 1: Distribution of excess traffic on the road section during the operational period Part 1 (2027)

	M35 motorway North	M35 motorway south	Highway 33	Route 354
Acoustic category I.	25%	15%	25%	10%
Acoustic category II.	25%	25%	0%	10%
Acoustic category III.	35%	35%	0%	0%

54. Table 2: Distribution of excess traffic on the road section during the operational period Part 2 (2027)

	North Connecting	BMW Boulevard North	BMW Boulevard East	BMW Boulevard West	BMW Boulevard South
Acoustic category I.	25%	100%	25%	25%	25%
Acoustic category II.	25%	100%	25%	25%	25%
Acoustic category III.	35%	100%	35%	0%	35%

During the period of operation, the Investor will transfer the finished product to the BMW car factory located on the opposite side of BMW Boulevard in the amount of 20 tgk/day (double this amount due to the return traffic). This stock will be used exclusively on the northern section of BMW Boulevard. The remaining freight traffic will access the facility from the M35 motorway. It is expected that the passenger car and bus traffic generated during the operational period will be distributed between the different directions.

6. Possibility of continuing to run a trail facility

The development of the utility and road network of the industrial park the responsibility of the industrial park operator, are or have been approved in a separate procedure and are not the subject of this document.

The electricity supply of the installation will be ensured by the connection to the 132/22 kV Debrecen Macs 132/22 kV substation operated by OPUS-TITÁSZ, as described in chapter 4.8. To connect the two substations, an underground cable network will be built to provide a connection between the Debrecen Macs 132/22 kV substation and the Debrecen Eve 132/11 kV transformer substation. Once constructed, the underground cable will be owned and operated by OPUS-TITÁSZ. The environmental impact of the construction of the underground cable as an infrastructure development was assessed in the preliminary study on the establishment and infrastructure provision of the Debrecen North-West Economic Belt, which was concluded by the decision issued under the registration number HB- 03/KTF/00117-2/2019.

The Permittee does not plan to continue the installation of a trail beyond the planning area after the development is completed. Based on the above, there are no plans to construct any trail facility as part of the implementation of the development that would be the responsibility of the Permittee and its environmental impacts have not been previously investigated and evaluated or as part of this permit application.

7. A planned Activity expected environmental impacts for the environmental elements as a whole

7.1. Air quality protection

7.1.1. Default state

The baseline air quality status of the planning area is presented in Chapter 5.4.

7.1.2. Impacts during the implementation period

7.1.2.1. Emissions from work machinery and heavy goods vehicles

During construction, exhaust fumes from construction equipment and trucks, as well as dust from the dust they stir up, can cause air pollution. Excavation, necessary soil backfilling and compaction, and pile driving in the area are underway based on the preliminary investigation and construction permits referenced in Chapter 0. Additional excavation and foundation and structure construction is planned for the site in connection with the site infrastructure development.

Emissions from earth-moving machinery and transport vehicles as mobile sources of air pollution during construction activities must be taken into account.

The large machines used in the works, as well as other tools and equipment used, are given in Table 113. In view of the tight schedule of the project in the area, it cannot be excluded that works are planned to be carried out during the night. During this period, the use of the machinery described in Table 114 is foreseen, based on the information provided by the Contractor. In addition, a concrete plant has been installed in the area to supply the concrete requirements for the construction works. Within the area, 12 truck movements per hour are expected during the day and a maximum of 4 truck movements per hour during the night for the delivery of materials and concrete from the concrete plant to the application area.

Taking the above into account, we can identify the area where the impacts are most pronounced, taking into account the emission inventory developed by the Institute of Transport Science and the data from Regulation (EU) 2016/1628 of the European Parliament and of the Council. It should be stressed that, in order to minimise the expected impact during construction, the Contracting Authority will specify as a criterion for the selection of the contractor that the machinery used must comply with the requirements set out in Annex II to the above-mentioned Regulation.

The emission inventory developed by HBEFA, referred to below, cannot be used in this case as it only provides data for speeds above 30 km/h.

The specific values for emissions in 2004 for heavy duty vehicles issued in 2006 are given in the tables below.

55. Table 1: Specific emissions data for heavy goods vehicles above 3.5 tonnes gross vehicle weight (g/km)

Business mode km/h	CO	CH (FID)	NO2	SO2	PM
10	22,69	2,40	8,39	0,15	2,55

Due to the size of the site and the location of the road and the concrete plant, a maximum of 1.345 km of on-site movement per vehicle is assumed. The calculated maximum emissions are given in the table below.

56. Table 1: Expected maximum emissions from heavy goods vehicles in the planning area (kg/h)

Period	CO	CH	NO_x	PM
Daytime	0,488	0,052	0,181	0,055
At night	0,244	0,026	0,090	0,027

Based on the power level of the machinery used, the pollutant emissions can be calculated taking into account the data from Regulation (EU) 2016/1628 of the European Parliament and of the Council. The expected maximum specific emissions of the machinery to be used and the estimated amount of pollutants to be emitted in the area in 1 hour were determined on the basis of data provided by the client. The range of machinery to be used only during the daytime was also determined. Based on the experience of previous projects, it is expected that the average utilisation of machinery will not exceed 75%.

The calculated value of the expected emissions and the calculated value of the cumulative emissions that will be emitted during construction are given in the table below.

57. Table 1: Expected maximum emission values from machinery in the planning area (kg/h)

Period	CO	CH (FID)	NO_x	PM
Daytime	16,29	0,82	1,73	0,06
At night	8,44	0,44	0,93	0,03

58. Table 1: Expected total emissions during construction works (kg/h)

Period	CO	CH (FID)	NO_x	PM
Daytime	16,78	0,87	1,91	0,12
At night	8,68	0,47	1,02	0,06

Taking into account the above emissions and the area of the property, the expected immission load can be calculated approximately.

Based on the experience of previous projects, the main specifications of the diesel generator that will temporarily supply electricity to the concrete plant are given below.

- Estimated power: ~364 ekW
- Fuel consumption at 100% power: ~95 l/h
- Emission characteristics:
  - Flue gas flow rate: 6 000 Nm^3/h
  - Flue gas temperature: 797,55 K
  - Flue gas outlet diameter: 200 mm
  - Flue gas discharge height: 2,5 m
  - Flue gas concentrations:
    - NO_x: 300 mg/Nm^3
    - CO: 272 mg/Nm^3
    - CH: 19.5 mg/Nm^3
    - PM: 16.3 mg/Nm^3

The Aermod View 12.0.0 software uses the Gaussian distribution used in the national standard for modelling, taking into account the US EPA's best modelling practice recommendations.

A series of verification tests carried out by the US EPA in several phases confirmed that the Aermod model values for NO_x and NO_2 are closest to the actual meteorological conditions at the receptor point at the 98th percentile for NOx and 99% for particulate matter. Accordingly, the 98th percentile of the calculated results for NO_2 and NO_x was used in the modelling, while the 99th percentile for particulate matter was used.

The calculated maximum concentrations are given in the table below.

59. Table 1: Expected immission load during construction works [ug/m3]

Material from Name	CH (FID)		CO		NO2		NOX		PM
averaging time	1 h	24 h	1 h	24 h	1 h	24 h	1 h	24 h	24 h
Maximum immission concentration [μg/m³]	354,09	56,45	6606,98	1079,82	83,26	46,69	88,14	53,89	7,1

The calculation results show that construction activities in the immediate vicinity of the development site do not exceed the relevant health limits. Given the low emission levels, concentrations decrease steadily away from the area affected by the construction and the calculated maximum exposure expected for the nearest protected zones is well below the limit values. After the construction works have been carried out, the air pollution will subside and the effects will be intermittent.

For information, the expected loads in the vicinity of the residential areas closest to the planning area have been determined and are given in the table below

60. Table 1: Expected immission load at the nearest protected objects during construction works [ug/m³]

Measurement point	CH		CO		NO2		NOX		PM10
	1 h	24 h	1 h	24 h	1 h	24 h	1 h	24 h	24 h
Small Catfish-Petersburg, 0263/8	26,04	1,21	500,62	23,68	1,88	1,08	2,09	1,20	0,19
Small Catfish-Petersian shoot, 0263/10	24,3	1,12	467,33	21,9	1,57	0,99	1,74	1,10	0,17
Small Catfish-Peterfiels, 0263/6	24,24	1,12	466,1	21,9	1,47	0,93	1,64	1,03	0,18
Small catfish-Peterfiad shoot, 0263/4	24,1	1,11	463,31	21,77	1,36	0,93	1,51	1,03	0,17
Small Catfish-Petersburg, 0263/3	24,02	1,11	461,95	21,71	1,32	0,93	1,47	1,04	0,17
Sightseeing Bar, 0316/58	21,42	1,42	411,89	27,52	2,50	1,16	2,78	1,29	0,21
Nagymacs, 67007	19,32	0,9	371,51	17,29	1,39	1,27	1,54	1,42	0,16
Big Mach, 0288/38	14,39	0,82	267,06	17,4	1,48	1,02	1,64	1,14	0,22
Ágnes farm, 0237/258	29,48	1,23	567,11	23,64	1,25	1,11	1,39	1,23	0,17
Kismacs, 65017	27,05	1,34	520,06	25,97	0,31	0,54	0,34	0,60	0,20
Kismacs, 65016	25,34	1,27	487,22	24,6	0,32	0,66	0,36	0,73	0,18
Kismacs, 65015	24,65	1,24	473,85	23,99	0,32	0,65	0,35	0,73	0,18
Kismacs, 65014	23,63	1,2	454,28	23,11	0,33	0,69	0,36	0,77	0,17
Kismacs, 65013	22,56	1,15	433,82	22,19	0,32	0,68	0,35	0,76	0,16
Measurement point	CH		CO		NO2		NOX		PM10

	1 h	24 h	1 h	24 h	1 h	24 h	1 h	24 h	24 h
Kismacs, 65012	21,24	1,09	408,43	21,02	0,31	0,73	0,35	0,81	0,16
Kismacs, 65011	20,16	1,04	387,54	20,05	0,31	0,71	0,35	0,79	0,15
Kismacs, 65010	18,47	0,96	355,01	18,53	0,32	0,70	0,35	0,77	0,14
Kismacs, 65009	16,76	0,88	322,23	16,98	0,33	0,71	0,37	0,79	0,12
Kismacs, 65008	15,11	0,8	290,53	15,47	0,31	0,75	0,35	0,83	0,11
Kismacs, 65007	13,34	0,72	256,53	13,84	0,32	0,74	0,36	0,82	0,10
Kismacs, 65004	13,08	0,65	251,95	12,52	0,32	0,76	0,35	0,84	0,09
Józsa, 53252/7	25,28	1,15	486,1	22,1	2,46	1,63	2,73	1,82	0,20

The impact of exhaust fumes will therefore be more pronounced in the vicinity of the work area, but the health limit values and design guideline values will be maintained within the area, according to the calculations based on the data provided by the Contracting Authority.

The nearest protected sites in the vicinity of the planning area are not expected to exceed the health limit values, even at low emission levels, which cause poorer mixing and dispersion of pollutants, when considering concentrations in combination with background exposure.

After the construction works have been carried out, the air pollution will subside and the effects will be temporary.

7.1.2.2. Loading port

Large areas of excavation and humus removal in the project area have been carried out under the construction permits described in Chapter 0, so no significant dust loading associated with excavation is expected. However, minor dusting in the project area cannot be excluded, taking into account the typical soil layers. The expected maximum dust generation is defined for a dust height of 4 m and a wind speed of 8 m/s.

$$v = \frac{\frac{1}{18}(\rho_p - \rho_l) \cdot g \cdot d^2}{\eta} \ (cm/s$$

If the air density is ignored in view of the low value:

$$v = \frac{\frac{1}{18} \cdot 2.6 \cdot 980 \cdot (8 \cdot 10^{-3})^2}{181410^{-7}} = 6.24 \ cm/s$$

Settling time of dust raised to a maximum height of 4 metres during loading:

$$t = \frac{s}{v} \ (s)$$

Where:

- t: time required for settling (sec)
- s: distance travelled (m)
- v: speed (m/s)

$$t = \frac{4}{0,4994} = 8s$$

The distance travelled by dust dispersed at an air speed of 8 m/s to settling:

$$s = v \cdot t \quad = 8 \cdot 8 = m$$

Based on the above, dust formation can cause air pollution up to a distance of ~64 m from the boundary of unpaved areas not affected by pre-dusting watering, which is smaller than the area of impact from exhaust emissions from machinery and trucks, which will be given later. The extent of the air quality protection zone per climate zone is described in the next chapter.

7.1.2.3. The air quality protection scope of the implementation

The method of determining the impact area is regulated by Government Decree 306/2010 (XII.23.) on air protection. Article 2.§ 12c. of the Decree:

12c. stationary diffuse source area: the maximum area around the diffuse source under consideration where the dispersion of an air pollutant emitted by the diffuse source maximum capacity utilisation, or, in the absence thereof, at typical operating conditions, which can be determined by technical estimation, is expected to cause the change in the ground-level air pollution in the vicinity of the air polluting diffuse source under near-surface and high-altitude meteorological conditions, calculated over the reference period, below the axis of the plume

a) greater than 10% of the one-hour (24-hour for $_{PM10}$) limit value,
b) greater than 20% of the load capacity,
c) more than 80% of the one-hour (24-hour for $_{PM10}$) maximum value, or
d) equal to or greater than the design guideline value when determining the odour protection zone;

To estimate the impact distance, we need to determine the one-hour air pollution exposure of the area, which is obtained by subtracting the baseline air pollution values from the one-hour health limit value or design guideline value.

The air quality limit values of the modelled air pollutants are given on the basis of the Joint Decree 4/2011 (14.I.VM.) for the components we have investigated.

61. Table 1: Health limit value or design guideline value for emissions and background exposure and load [$^{\mu g/m3}$]

Material from	Threshold	Background load	Contact
CO	10 000	408	9 592
NOx	200	17	183
NO2	100	11,6	88,4
PM10	50	20	30
CH (paraffinic hydrocarbons)	500	-	500

In defining the area of influence, maximum concentrations determined by taking into account the actual meteorological conditions were taken into account. An exception to this is the parameter $_{NOx}$, $_{NO2}$, where the US EPA has found in parallel modelling (validation) that the calculation method used gives higher values than the actual data. The 98% percentile value for the $_{NO2}$ and $_{NOx}$ parameters is more representative of reality.

The calculation of the air quality protection impact area must be carried out for the development, so for the purposes of this calculation, activities in adjacent areas have been ignored. The air quality protection impact areas resulting from the calculation carried out using the above method are shown in the table below.

62. Table 1: Calculation of the air quality protection zone of the proposed activity

Polluter Material from	**Emission concentration [μg/m³]**	**Area of application for the delimitation of the concentration [μg/m³]**			**Coverage [m]**		
		Criteria			**Criteria**		
		A)	**B)**	**C)**	**A)**	**B)**	**C)**
CH	354,1	50	100	283,27	2137	1209	407
CO	6606,98	1000	1918,4	5285,59	2099	1216	413
NO2	83,26	10	17,68	66,61	934	644	224
NOx	88,14	20	36,6	70,51	637	547	243
PM10	7,1	5	10	5,68	210	-	193

Taking the largest of the above into account, the maximum air quality protection footprint of the construction is 2 137 m from the centre of the recorded work area, which is attributable to CH emissions. The large extent of the footprint is due to the low emission height of the pollutant and the relatively large number of construction machines and trucks. As can be seen in Table 60, the calculated concentrations at the nearest points of protection are significantly below the limit value.

The extent of the combined scope of the construction from the boundary of the site, main and secondary boundaries are presented below:

63. Table 1: Extent of the air quality protection zone of the project from the site boundary by main and secondary air quality protection zones

Directions to	**The largest area of influence is the from property boundary [m]**
North	968
North East	1 214
East	1 661
South East	1 105
South	1 123
South West	1 426
West	675
North West	517

7.1.2.4. Off-site transport

The expected volume of trucks and concrete mixers and leaving the planning area is described in Section 4.15.1.

The studies will examine the impact on the roads concerned. The expected emissions and immission concentrations, taking into account the current and typical traffic flows on the roads concerned during the construction period, are as follows.

The specific emission values for lorries are taken from the Manual of Emission Factors for Road Transport (HBEFA) was determined using. This handbook has been compiled by the German, Swiss, and Austrian environmental agencies and the

A software database developed by the Joint Research Centre (JRC). The correspondence between the database and the Hungarian emission data was investigated by the Department of Fluid Mechanics of the BME in 2015, based on data from 2001 to 2006 and on-site measurements, which showed a 4-year difference between the German and Hungarian emission data. Given that in recent years the average age difference between the two countries' vehicle fleets has increased by 2 years compared to the period under study, we have calculated emissions using 6 years of data from Germany.

The calculation is based on the requirements of standards MSZ 21457-4 and MSZ 21459-2.

64. Table 1: Main parameters of the road sections concerned in the air quality modelling

Name of road		M35 motorway north	M35 motorway south	Highway 33	Route 354	Northern access About M35	BMW Boulevard North	BMW Boulevard East	BMW Boulevard West	BMW Boulevard South
Type of road		Motorway	Motorway	Main road II	Byway	Byway	Byway	Byway	Byway	Byway
Speed limit (km/h)	Passenger car, van, motor	130	130	90	90	60	60	60	60	60
	Bus	100	100	70	70	60	60	60	60	60
	Other tgk.	80	80	70	70	60	60	60	60	60
Way vs wind direction (°)		50	50	45	45	50	45	65	35	45
Wind speed (m/s)		3	3	3	3	3	3	3	3	3
Closest distance to be protected (m)		430	290	75	560	500	940	635	1140	350
Nearest parcel to be protected.		53377 (Rose Valley Street 240.)	0356/2	65040/1 (Greenfield 2.)	0249/4 (Varga farm)	53255/3 (215 Elek street)	0237/258 (Ágnes farm)	0249/6 (Domokos Márton garden 51.)	0263/8 (Peter's Day 5.)	0249/6 (Domokos Márton garden 51.)
Discharge height (m)		0,3	0,3	0,3	0,3	0,3	0,3	0,3	0,3	0,3
Stability value		B	B	B	B	B	B	B	B	B
Stability parameter		flat area plant folio	flat area plant folio	flat area plant folio	flat area plant folio	flat area plant folio	flat area plant folio	flat area plant folio	flat area plant folio	flat area plant folio

65. Table 1: Air quality protection calculation results for the construction phase (2025)

Name of road		M35 motorway North	M35 motorway south	Highway 33	Route 354	Northern access About M35	BMW Boulevard North	BMW Boulevard East	BMW Boulevard West	BMW Boulevard South	Health limit value
CO	Emission (mg/m*s)	0,429	0,456	0,304	0,251	0,107	0,014	0,068	0,005	0,108	
	Emission maximum (µg/m³)	202,040	215,161	44,186	36,558	50,368	1,971	10,175	1,360	15,662	10000
	(a) Criterion (m)	N.É.	N.É.	N.É.	N.É.	N.É.	N.É.	N.É.	N.É.	N.É.	
	(b) Criterion area of influence (m)	N.É.	N.É.	N.É.	N.É.	N.É.	N.É.	N.É.	N.É.	N.É.	
	(c) Criterion area of influence (m)	2	2	2	2	2	2	2	2	2	
CH	Emission (mg/m*s)	0,012	0,013	0,008	0,006	0,011	0,001	0,007	<0,001	0,013	
	Emission maximum (µg/m³)	5,831	6,248	1,205	0,926	5,184	0,175	1,022	0,113	1,880	500
	(a) Criterion (m)	N.É.	N.É.	N.É.	N.É.	N.É.	N.É.	N.É.	N.É.	N.É.	
	(b) Criterion area of influence (m)	N.É.	N.É.	N.É.	N.É.	N.É.	N.É.	N.É.	N.É.	N.É.	
	(c) Criterion area of influence (m)	2	2	2	2	2	2	2	2	2	
NOx	Emission (mg/m*s)	0,494	0,515	0,243	0,184	0,364	0,033	0,230	0,008	0,394	
	Emission maximum (µg/m³)	232,750	242,666	35,287	26,751	171,472	4,746	34,431	2,448	57,351	200
	(a) Criterion (m)	12	13	2	1	9	N.É.	2	N.É.	3	
	(b) Criterion area of influence (m)	7	7	1	N.É.	5	N.É.	N.É.	N.É.	1	
	(c) Criterion area of influence (m)	2	2	2	2	2	2	2	2	2	
NO2	Emission (mg/m*s)	0,113	0,120	0,068	0,049	0,038	0,005	0,023	0,002	0,047	
	Emission maximum (µg/m³)	53,252	56,519	9,858	7,142	17,800	0,782	3,454	0,596	6,782	100
	(a) Criterion (m)	6	6	N.É.	N.É.	2	N.É.	N.É.	N.É.	N.É.	
	(b) Criterion area of influence (m)	3	4	N.É.	N.É.	1	N.É.	N.É.	N.É.	N.É.	
	(c) Criterion area of influence (m)	2	2	2	2	2	2	2	2	2	
PM	Emission (mg/m*s)	0,011	0,012	0,006	0,004	0,006	<0,001	0,004	<0,001	0,006	
	Emission maximum (µg/m³)	1,219	1,305	0,198	0,131	0,634	0,020	0,127	0,011	0,215	50
	(a) Criterion (m)	N.É.	N.É.	N.É.	N.É.	N.É.	N.É.	N.É.	N.É.	N.É.	
	(b) Criterion area of influence (m)	N.É.	N.É.	N.É.	N.É.	N.É.	N.É.	N.É.	N.É.	N.É.	
	(c) Criterion area of influence (m)	2	2	2	2	2	2	2	2	2	

66. Table 1: Changes in air quality protection pressures on roads in the construction phase (2025) (expected increases)

Name of road		M35 motorway north	M35 motorway south	Highway 33	Route 354	Northern access About M35	BMW Boulevard North	BMW Boulevard East	BMW Boulevard West	BMW Boulevard South
CO	**Emission (mg/m*s)**	0,003	0,003	<0,001	<0,001	0,002	0,005	0,002	<0,001	0,002
	Emission maximum (μg/m³)	1,536	1,381	0,119	0,048	1,162	0,777	0,369	0,059	0,358
	Change in area of influence [m]	0	0	0	0	0	0	0	0	0
CH	**Emission (mg/m*s)**	<0,001	<0,001	<0,001	<0,001	<0,001	<0,001	<0,001	<0,001	<0,001
	Emission maximum (μg/m³)	0,077	0,073	<0,01	<0,01	0,108	0,071	0,034	<0,01	0,033
	Change in area of influence [m]	0	0	0	0	0	0	0	0	0
NOx	**Emission (mg/m*s)**	0,007	0,006	<0,001	<0,001	0,008	0,016	0,008	<0,001	0,008
	Emission maximum (μg/m³)	3,177	3,034	0,110	0,044	3,658	2,354	1,161	0,098	1,128
	Change in area of influence [m]	0	1	0	0	0	0	1	0	0
NO2	**Emission (mg/m*s)**	<0,001	<0,001	<0,001	<0,001	<0,001	0,002	<0,001	<0,001	<0,001
	Emission maximum (μg/m³)	0,407	0,361	0,035	0,014	0,378	0,264	0,120	0,031	0,116
	Change in area of influence [m]	0	0	0	0	0	0	0	0	0
PM	**Emission (mg/m*s)**	<0,001	<0,001	<0,001	<0,001	<0,001	<0,001	<0,001	<0,001	<0,001
	Emission maximum (μg/m³)	0,014	0,013	<0,01	<0,01	0,014	<0,01	<0,01	<0,01	<0,01
	Change in area of influence [m]	0	0	0	0	0	0	0	0	0

67. Table 3: Calculated emission concentrations at the nearest line of defence in the construction phase (2025)

Name of road		M35 motorway north	M35 motorway south	Highway 33	Route 354	Northern access About M35	BMW Boulevard North	BMW Boulevard East	BMW Boulevard West	BMW Boulevard South	Health limit value
CO	**Emission maximum (μg/m³)**	1,533	2,525	0,630	0,056	0,323	<0,01	0,014	<0,01	0,041	10000
CH	**Emission maximum (μg/m³)**	0,044	0,073	0,017	<0,01	0,033	<0,01	<0,01	<0,01	<0,01	500
NOx	**Emission maximum (μg/m³)**	1,766	2,848	0,503	0,041	1,101	<0,01	0,048	<0,01	0,148	200
NO2	**Emission maximum (μg/m³)**	0,404	0,663	0,141	0,011	0,114	<0,01	<0,01	<0,01	0,018	100
PM	**Emission maximum (μg/m³)**	<0,01	0,015	<0,01	<0,01	<0,01	<0,01	<0,01	<0,01	<0,01	50

As can be seen from the modelling results, the immission concentrations calculated taking into account the prevailing wind direction for the road sections concerned result in NOx concentrations above the health limit value along the axis of the road for the sections of the M35 motorway under consideration, but without any persistent human presence. For the other road sections, no pollutant loads above the limit values are expected along the axis of the carriageway. For the nearest protected zones, no road sections under consideration are expected to generate loads above the limit value.

Considering that after the construction phase, which involves a significant truck movement, the immission concentrations continue to decrease, the impacts are not considered significant.

7.1.3. Impacts during the period of operation

The installation of process point sources and point sources connected to the steam and thermal oil supply equipment of the facility is planned. Cooling towers will be installed in the facility as fugitive emission sources for the pre-treatment of grey water supplied by Debreceni Vízmű Zrt. Another source is the diesel pumps which are part of the fire-fighting system and which, under normal operating conditions, are only operated occasionally check that they are working properly.

Passenger vehicles and lorries are only destination vehicles within the site, so the air quality impact of traffic within the site is not significant.

7.1.3.1. Point sources

The installation of 3 to 3 natural gas boilers is planned to supply the steam boilers and the thermal oil system. Where necessary, the installation of point sources for direct extraction at process equipment is planned. The extraction of any room or part of a room where any release of chemicals is expected will also be routed to the point of emission. Summary details of the point sources planned to be installed are given in Table 68.

The point sources planned to be installed in the installation can be classified into the following air pollution control technologies
be:

- **T1:** Cathode coating (P1, P3, P5-P8, P38 point sources)
- **T2:** Anode coating (P2, P4, P9-P12 point sources)
- **T3:** Laser cutting (P13-P20 and P26 point sources)
- **T4:** Welding (P30-P32 point sources)
- **T5:** Battery cell production (P21-P25, P27-P29, P33-P37, P40-P43 point sources)
- **T6:** Waste management (P39 point sources
- **T7:** Wastewater treatment extraction (P50 point source)
- **T8:** Kitchen exhaust (P51-P52 point sources)
- **T9:** Heat supply (P44-P49 point sources)
- **T10:** Diesel pumps (P53-P54 point sources)

The numbering of point sources to be installed and a description of the associated technology as follows
specify.

- **Point source P1:** Vacuum extraction associated with the injection of solid ingredients for the production of cathode slurry is linked to this point source
- **P2 point source:** Vacuum extraction associated with the dosing of solid ingredients for the production of anode slurry is linked to this point source
- **Point source P3:** The cathode slurry is produced using a vacuum system, the extraction of which and the ventilation of the associated laboratories and washrooms are connected to this point source.

- **Point source P4:** The anode slurry is produced using a vacuum system, the extraction of which and the ventilation of the associated laboratories and washrooms are connected to this point source.
- **Point source P5:** For quality assurance reasons, after coating, local dust extraction is performed at several points in the technology on the cathode side and is connected to this point source.
- **P6-P8 point sources:** the application equipment on the 3 production lines is separated from the room and has its own local exhaust. The air exhausted from the coating rooms is directed to the NMP condensing system NMP separator on the cathode side, which are connected to 1-1 point source
- **Point source P9:** For quality assurance reasons, after coating, the technology will have local dust extraction at the anode side in several places, which are connected to this point source.
- **P10-P12 point sources:** the air exhausted from the coating rooms is cleaned on activated carbon towers on the anode side, connected to 1-1 point source.
- **P13-P20:** Polluted air streams exhausted during laser cutting are released to the environment after separation
- **P21 point source:** the air stream exhausted from the laser engraving marking equipment is released to the environment after separation.
- **P22-P24 point sources:** welding fumes are extracted separately during the assembly process and are emitted at point sources after separation
- **P25 point source:** the vacuum drying process has a total of 24 vacuum furnaces. The contaminated air from the vacuum system and from the dust extraction in the room is discharged through a point source after separation.
- **Point source P26:** During assembly, a vacuum system will be installed in several locations, with the exhausts being connected to a common manifold. In order to ensure a stable exhaust flow rate, part of the welding exhausts from the assembly line and the marking equipment exhausts will also be routed to this manifold and, after passing through the separation technology described below, will be discharged to the environment via a common point source after separation of the pollutants in the air stream.
- **P27-P29 point sources:** the electrolyte injection equipment will be isolated from the room and will have its own local exhaust, the exhaust airflow will be directed to an activated carbon separator prior to discharge at the point source.
- **P30-P32 point sources:** after ageing, the batteries are sealed by laser welding. The gases generated during welding are emitted after deposition on point sources
- **P33-P35 point sources:** these central removals provide the removal of the following activities per line below. The extracted polluted air is cleaned in an activated carbon separator and then discharged at point sources:
    - During the precharge, a passivation surface is created on the anode side and small amounts of gases and vapours are evolved in the cell. The process is carried out in a closed chamber with vacuum extraction.
    - After cleaning, a labelling film is placed on the finished battery and the information required for identification is printed on the film. A marking ink is used during the printing process. A

small amounts of volatile organic vapours from the process are released into the environment after activated carbon capture
    - The air density of the battery is checked with a mass spectrometer. During the process, if there is a sealing defect in the battery cell, traces of electrolyte volatile gas are produced.

- **P36 point source:** additional identification information is printed on the battery as part of the packaging. The printing process uses the marking ink mentioned earlier. The small amounts of volatile organic vapours generated during printing are released into the environment after activated carbon capture.
- **Point source P37:** The electrolyte tank farm effluent is cleaned in a multi-stage separation plant and discharged via a point source.
- **Point source P38:** The NMP tank farm effluent is treated in a multi-stage separation plant and discharged at a point source.
- **Point source P39:** After dismantling the battery, the anode foils that pose a safety risk are placed in the anode foil handling equipment in the BD building. The exhaust air from the equipment is discharged through the point source after a multi-stage separation process.
- **Point sources P40-P41**: Emissions from test equipment, local exhausts and ventilation of the scrap battery dismantling room are discharged to the environment after activated carbon capture.
- **Point source P42:** The ventilation of the hazardous waste and hazardous material storage building will be connected to an active carbon tower.
- **Point source P43:** During the raw material tests planned to be carried out in the raw material storage, the polluted air generated in the equipment is directed to the activated carbon separator on the roof of the building and after treatment is discharged at the point source.
- **Point sources P44-P46:** The steam demand of the technology is supplied, among others, by 3 natural gas-fired steam boilers with a rated thermal input of 10.5 MW. The flue gases from the boilers will be discharged through 1-1 chimney installed in a support structure. Preliminary plans indicate that 1 of the 3 boilers will be a back-up in all cases.
- **Point sources P47-P49:** thermal oil system of the technology will be heated by 3 natural gas boilers, 2 of 17.5 MW and 1 of 15 MW. Preliminary plans indicate that 1 of the 3 boilers will be back-up in all cases.
- **P50 point source:** the polluted air from the aerators of the tanks and the local exhausts of the treatment room to be used in the wastewater technology is subjected to activated carbon capture prior to discharge at the point source.
- **P51-P52 point sources:** the extraction hoods used in the canteen are connected to 2 extraction systems connected to 1-1 point source. Based on design data, the installation of a disconnect for these sources is not justified based on previous experience.
- **Point sources P53-P54:** In accordance with the legal requirements, the fire-fighting system of the facility will be equipped with diesel pumps in addition to electric pumps. The pumps are required to operate for half an hour per month for safety reasons. Given the dual power supply of the installation, the likelihood of longer periods of operation is low. Based on the design data, the pumps have a capacity of 245 kW and 210 kW respectively.

to operate the system on a leapfrog basis. The nominal input thermal power calculated taking into account the fuel consumption (23.8 kg/h and 20.4 kg/h) is 297 kW for the P53 point source and 255 kW for the P54 point source.Based on the design data, the fuel consumption of the equipment does not exceed the value of 50 kg/h according to the provisions of Article 4, paragraph 13, § 4 of the Decree 53/2017 (X. 18.) FM.

The main details of the point sources that are subject to reporting are given below.

68. Table 1 Key data on planned air quality protection point sources

ID	Related Activity	Technology	Height [m]	Diameter [m]	Flow rate [m/s]	Temperature [K]	Volumetric flow [m³/h]	EOV Y	EOV X
P1	Cathode slurry solid administration of ingredients	T1	27	0,63	18,7	308	21 000	835959,5	251414,4
P2	Anode slurry solid administration of ingredients	T2	27	0,63	19,6	308	22 000	835960,7	251379,6
P3	Slurry production of cathode	T1	27	0,63	16,6	308	18 600	835930,7	251453,3
P4	Slurry production anode	T2	27	0,63	12,5	308	14 000	835944,4	251362,1
P5	Cathode film dust extraction	T1	27	0,63	14,7	308	16 500	835839,73	251459,91
P6	Cathode foil coating	T1	27	1,2	11,5	328	47 000	835838,87	251454,48
P7	Cathode foil coating	T1	27	1,2	11,5	328	47 000	835851,31	251454,87
P8	Cathode foil coating	T1	27	1,2	11,5	328	47 000	835863,76	251455,09
P9	Anode foil dust extraction	T2	27	0,63	14,7	303	16 500	835839,6	251350,3
P10	Anode foil coating 1	T2	27	1,2	11,8	328	48 000	835835,2	251392,6
P11	Anode foil coating 2	T2	27	1,2	11,8	328	48 000	835835,6	251378,5
P12	Anode foil coating 3	T2	27	1,2	11,8	328	48 000	835836	251365,7
P13	Laser cutting and winding 1	T3	27	0,8	14,4	308	26 000	835709	251448,7
P14	Laser cutting and winding 2	T3	24,45	0,8	14,4	308	26 000	835696,67	251448,3
P15	Laser cutting and winding 3	T3	24,45	0,8	14,4	308	26 000	835712,1	251353,1
P16	Laser cutting and winding 4	T3	24,45	0,8	14,4	308	26 000	835699,8	251352,7
P17	Laser cutting and winding 5	T3	24,45	0,9	13,1	308	30 000	835655,7	251418,3
P18	Laser cutting and winding 6	T3	24,45	0,9	13,1	308	30 000	835656,8	251385,7
P19	Laser cutting and winding 7	T3	24,45	0,63	14,3	308	16 000	835684,3	251447,9
P20	Laser cutting and winding 8	T3	24,45	0,63	14,3	308	16 000	835687,4	251352,2
P21	Engraver	T5	24,45	0,5	10,2	308	7 200	835656,2	251400,8
P22	Assembly line 1	T5	24,45	1,1	11,7	318	40 000	835608,6	251349,7
P23	Assembly line 2	T5	24,45	1,1	11,7	318	40 000	835599,4	251445,1
P24	Assembly line 3	T5	24,45	1,1	11,7	318	40 000	835576,8	251421,5
P25	Vacuum drying	T5	24,45	1	8,5	318	24 000	835533,4	251445
P26	Assembly 4	T3	24,45	1	10,1	308	28 500	835636,5	251351,1
P27	Injection 1	T5	24,45	1,2	11,1	308	45 000	835522,7	251420,4
P28	Injection 2	T5	24,45	1,2	11,1	308	45 000	835523,7	251390,6
P29	Injection 3	T5	24,45	1,2	11,1	308	45 000	835524,6	251362,8

ID	Related Activity	Technology	Height [m]	Diameter [m]	Flow rate [m/s]	Temperature [K]	Volumetric flow [m³/h]	EOV Y	EOV X
P30	Closure welding 1	T4	23,94	0,35	11,5	318	4 000	835397,4	251481
P31	Closure welding 2	T4	23,94	0,35	11,5	318	4 000	835400	251399,1
P32	Closure welding 3	T4	23,94	0,35	11,5	318	4 000	835400,5	251384,1
P33	Formatting 1	T5	23,94	0,8	12,2	308	22 000	835388,7	251489,5
P34	Formatting 2	T5	23,94	0,8	12,2	308	22 000	835391,4	251406,7
P35	Formatting 3	T5	23,94	0,8	12,2	308	22 000	835392,2	251382,3
P36	Print from	T5	24,56	0,35	8,7	308	3 000	835530,5	251310,8
P37	Electrolyte tank farm	T5	10	1,1	13,2	308	45 000	835534,5	251490,2
P38	NMP tank farm	T1	10	0,63	13,4	308	15 000	835912,7	251477,7
P39	Anode foil treatment (BD building)	T6	10	0,35	15,9	433	5 500	835240	251586,5
P40	Test building 1	T6	11,5	1	10,6	308	30 000	835232,3	251545
P41	Test building 2	T6	11,5	1	10,6	308	30 000	835247,5	251545,5
P42	Waste storage	T6	8	0,5	11,6	308	8 200	835236,8	251636,7
P43	Raw material testing	T5	21	0,63	11,6	308	13 000	835672,8	251309,9
P44	Steam boiler 1	T9	40	0,9	7,2	364,15	16 490	835774,4	251477,8
P45	Steam boiler 2	T9	40	0,9	7,2	364,15	16 490	835773,5	251477,7
P46	Steam boiler 3	T9	40	0,9	7,2	364,15	16 490	835774	251477
P47	Hot oil boiler 1	T9	40	1,2	9	448,15	36 766	835774,2	251473
P48	Hot oil boiler 2	T9	40	1,2	9	448,15	36 766	835773,5	251473,4
P49	Hot oil boiler 3	T9	40	1	13	448,15	36 766	835774,2	251473,9
P50	Sewage treatment suction	T7	30	0,5	10,8	300	7 620	835648,6	251509
P51	Kitchen oil extraction 1	T8	20,5	0,63	8	338,15	9 000	835734,69	251262,20
P52	Kitchen oil extraction 2	T8	20,5	0,63	8	338,15	9 000	835729,54	251262,03
P53	Diesel pump 1	T10	19,5	0,2	17,7	685	2 000	835594,93	251464,38
P54	Diesel pump 2	T10	19,5	0,2	15,5	685	1 755	835610,03	251464,87

The expected emissions at point sources are shown in the table below. The data for the point sources to be installed have been determined on the basis of the information provided by the Designer or the Contractor, based on the experience of the Permittee's existing installations in other countries, using the mass balance data for this installation and the efficiency of the planned separation equipment. The low emission concentrations at several point sources are attributed to multi-step capture and typically closed technologies, which are best available techniques to minimise the environmental impact and thus minimise material losses.

69. Table 1: Expected emission characteristics of point sources

ID	Pollutants	CAS number	Emission concentration	Classification	Emission limit value
			(mg/m^3)		(mg/m^3)
P1	Solid material	-	0,1393	2.1.1 O	50
	Nickel	7440-02-0	0,1	2.1.1 B	0,5
	Cobalt	7440-48-4	0,007	2.1.1. B	0,5
	Manganese	7440-02-0	0,003	2.1.1. C	1
	Aluminium	7440-02-0	0,0019	2.1.1. O	50
	Lithium	623-53-0	0,013	2.1.1. C	1
	Graphite	7782-42-5	0,0019	2.1.1. O	50
	Polyvinylidene fluoride (PVDF)	24937-79-9	0,0039	2.1.1. C	5
	2.1.1 Total Class A and B		0,107		0,5
	2.1.1 Total Class A and C		0,0199		1
P2	Solid material	-	0,176	2.1.1. O	50
	Graphite	7782-42-5	0,16	2.1.1. O	50
	Silicon	7440-21-3	0,012	2.1.1. O	50
	Carboxymethyl cellulose (CMC)	9004-32-4	0,004	2.1.1. O	50
P3* **	Solid material	-	0,038	2.1.1. O	50
	Nickel	7440-02-0	0,02	2.1.1 B	0,5
	Cobalt	7440-48-4	0,0035	2.1.1. B	0,5
	Manganese	7440-02-0	0,0014	2.1.1. C	1
	Aluminium	7440-02-0	0,0001	2.1.1. O	50
	Lithium	623-53-0	0,007	2.1.1. C	1
	Graphite	7782-42-5	0,001	2.1.1. O	50
	Polyvinylidene fluoride (PVDF)	24937-79-9	0,002	2.1.1. C	5
	N-methyl-2-pyrrolidone (NMP)	872-50-4	0.606 mgC/Nm^3	BAT 24	0.606 mgC/Nm^3
	2.1.1 Total Class A and B		0,0235		0,5
	2.1.1 Total Class A and C		0,0104		1
P4	Solid material	-	0,1	2.1.1. O	50
	Graphite	7782-42-5	0,092	2.1.1. O	50
	Silicon	7440-21-3	0,007	2.1.1. O	50

ID	Pollutants	CAS number	Emission concentration (mg/m³)	Classification	Emission limit value (mg/m³)
	Carboxymethyl cellulose (CMC)	9004-32-4	0,001	2.1.1. O	50
P5	Solid material	-	0,1	2.1.1. O	50
	Nickel	7440-02-0	0,011	2.1.1. B	0,5
	Cobalt	7440-48-4	0,001	2.1.1. B	0,5
	Manganese	7440-02-0	0,0003	2.1.1. C	1
	Aluminium	7440-02-0	0,0001	2.1.1. O	50
	Lithium	623-53-0	0,0014	2.1.1. C	1
	Graphite	7782-42-5	0,0002	2.1.1. O	50
	Polyvinylidene fluoride (PVDF)	24937-79-9	0,0002	2.1.1. C	5
	Diethylene glycol (DEG)	111-46-6	0,1488	2.3.1.C	150
	2.1.1 Total Class A and B		0,012		0,5
	2.1.1 Total Class A and C		0,0019		1
P6* **	N-methyl-2-pyrrolidone (NMP)	872-50-4	0.606 mgC/Nm^3	BAT 24	0.606 mgC/Nm^3
P7* **	N-methyl-2-pyrrolidone (NMP)	872-50-4	0.606 mgC/Nm^3	BAT 24	0.606 mgC/Nm^3
P8* **	N-methyl-2-pyrrolidone (NMP)	872-50-4	0.606 mgC/Nm^3	BAT 24	0.606 mgC/Nm^3
P9	Solid material	-	0,1	2.1.1. O	50
	Graphite	7782-42-5	0,064	2.1.1. O	50
	Silicon	7440-21-3	0,0048	2.1.1. O	50
	Carboxymethyl cellulose (CMC)	9004-32-4	0,0014	2.1.1. O	50
	Diethylene glycol (DEG)	111-46-6	0,1193	2.3.1.C	150
P10	Solid material	-	0,001	2.1.1. O	50
	Graphite	7782-42-5	0,0006	2.1.1. O	50
	Silicon	7440-21-3	0,0001	2.1.1. O	50
	Carboxymethyl cellulose (CMC)	9004-32-4	0,00001	2.1.1. O	50
	Polyacrylic acid (PAA)	9003.01.04	0,4	2.3.1 C	150
P11	Solid material	-	0,001	2.1.1. O	50
	Graphite	7782-42-5	0,0006	2.1.1. O	50
	Silicon	7440-21-3	0,0001	2.1.1. O	50

ID	Pollutants	CAS number	Emission concentration	Classification	Emission limit value
			(mg/m³)		(mg/m³)
	Carboxymethyl cellulose (CMC)	9004-32-4	0,00001	2.1.1. O	50
	Polyacrylic acid (PAA)	9003.01.04	0,4	2.3.1 C	150
P12	Solid material	-	0,0011	2.1.1. O	50
	Graphite	7782-42-5	0,001	2.1.1. O	50
	Silicon	7440-21-3	0,0001	2.1.1. O	50
	Carboxymethyl cellulose (CMC)	9004-32-4	0,00001	2.1.1. O	50
	Polyacrylic acid (PAA)	9003.01.04	0,4	2.3.1 C	150
P13	Aluminium	7440-02-0	1	2.1.1. O	50
P14	Aluminium	7440-02-0	1	2.1.1. O	50
P15	Aluminium	7440-02-0	1	2.1.1. O	50
P16	Aluminium	7440-02-0	1	2.1.1. O	50
P17	Copper	7440-50-8	0,17	2.1.1. C	5
P18	Copper	7440-50-8	0,17	2.1.1. C	5
P19	Copper	7440-50-8	0,17	2.1.1. C	5
P20	Copper	7440-50-8	0,17	2.1.1. C	5
P21	NMHC (paraffinic hydrocarbons from except methane)	-	1	2.3.1 C	150
P22	Solid material	-	1,8	2.1.1. O	50
	Aluminium	7440-02-0	0,85	2.1.1. O	50
	Copper	7440-50-8	0,17	2.1.1. C	5
	Iron	7439-89-6	0,068	2.1.1. O	50
	Manganese	7440-02-0	0,012	2.1.1. C	1
	Nickel	7440-02-0	0,0162	2.1.1. B	0,5
	NOX	-	4,1	2.2 D	500
	CO	630-08-0	2,3	2.2 D	500
	2.1.1 Total Class A and B		0,0162		0,5
	2.1.1 Total Class A and C		0,182		1
P23	Solid material	-	1,8	2.1.1. O	50
	Aluminium	7440-02-0	0,85	2.1.1. O	50

ID	Pollutants	CAS number	Emission concentration (mg/m³)	Classification	Emission limit value (mg/m³)
	Copper	7440-50-8	0,17	2.1.1. C	5
	Iron	7439-89-6	0,068	2.1.1. O	50
	Manganese	7440-02-0	0,012	2.1.1. C	1
	Nickel	7440-02-0	0,0162	2.1.1. B	0,5
	NOX	-	4,1	2.2 D	500
	CO	630-08-0	2,3	2.2 D	500
	2.1.1 Total Class A and B		0,0162		0,5
	2.1.1 Total Class A and C		0,182		1
P24	Solid material	-	1,8	2.1.1. O	50
	Aluminium	7440-02-0	0,85	2.1.1. O	50
	Copper	7440-50-8	0,17	2.1.1. C	5
	Iron	7439-89-6	0,068	2.1.1. O	50
	Manganese	7440-02-0	0,012	2.1.1. C	1
	Nickel	7440-02-0	0,0162	2.1.1. B	0,5
	NOX	-	4,1	2.2 D	500
	CO	630-08-0	2,3	2.2 D	500
	2.1.1 Total Class A and B		0,0162		0,5
	2.1.1 Total Class A and C		0,182		1
P25	Solid material	-	0,0024	2.1.1. O	50
	Aluminium	7440-02-0	0,00113	2.1.1. O	50
	Copper	7440-50-8	0,00113	2.1.1. C	5
	2.1.1 Total Class A and C		0,00113		1
P26	Solid material	-	0,0024	2.1.1. O	50
	Aluminium	7440-02-0	0,0011	2.1.1. O	50
	Copper	7440-50-8	0,0011	2.1.1. C	5
	Diethylene glycol (DEG)	111-46-6	0,1189	2.3.1.C	150
	2.1.1 Total Class A and C		0,0011		1
P27	Solid material	-	2	2.1.1. O	50

ID	Pollutants	CAS number	Emission concentration	Classification	Emission limit value
			(mg/m³)		(mg/m³)
	LiPF6	21324-40-3	0,301	2.1.1. C	5
	Dimethyl carbonate (DMC)	616-38-6	6,027	2.3.1 C	150
	Ethylene carbonate (EC)	96-49-1	3,01	2.3.1 C	150
	Ethyl methyl carbonate (EMC)	623-53-0	3,01	2.3.1 C	150
	Vinyl carbonate (VC)	872-36-6	0,6	2.5.4 C	1
	Hydrogen fluoride	7664-39-3	0,017	2.2 B	5
	2.1.1 Total Class A and C		0,301		1
	2.3.1. Total class C		12,047		150
P28	Solid material	-	2	2.1.1. O	50
	LiPF6	21324-40-3	0,3	2.1.1. C	5
	Dimethyl carbonate (DMC)	616-38-6	6,026	2.3.1 C	150
	Ethylene carbonate (EC)	96-49-1	3,013	2.3.1 C	150
	Ethyl methyl carbonate (EMC)	623-53-0	3,03	2.3.1 C	150
	Vinyl carbonate (VC)	872-36-6	0,6	2.5.4 C	1
	Hydrogen fluoride	7664-39-3	0,017	2.2 B	5
	2.1.1 Total Class A and C		0,3		1
	2.3.1. Total class C		12,069		150
P29	Solid material	-	2	2.1.1. O	50
	LiPF6	21324-40-3	0,301	2.1.1. C	5
	Dimethyl carbonate (DMC)	616-38-6	6,027	2.3.1 C	150
	Ethylene carbonate (EC)	96-49-1	3,013	2.3.1 C	150
	Ethyl methyl carbonate (EMC)	623-53-0	3,013	2.3.1 C	150
	Vinyl carbonate (VC)	872-36-6	0,6	2.5.4 C	1
	Hydrogen fluoride	7664-39-3	0,017	2.2 B	5
	2.1.1 Total Class A and C		0,301		1
	2.3.1. Total class C		12,053		150
P30	Solid material	-	1,8	2.52.1	150
	Iron	7439-89-6	1,55	2.1.1. O	50
	Manganese	7440-02-0	0,178	2.1.1. C	1

ID	Pollutants	CAS number	Emission concentration (mg/m³)	Classification	Emission limit value (mg/m³)
	Nickel	7440-02-0	0,018	2.1.1. B	0,5
	NOX	-	4,1	2.52.1	500
	CO	630-08-0	2,3	2.52.1	500
	2.1.1 Total Class A and B		0,018		0,5
	2.1.1 Total Class A and C		0,178		1
P31	Solid material	-	1,8	2.52.1	150
	Iron	7439-89-6	1,55	2.1.1. O	50
	Manganese	7440-02-0	0,178	2.1.1. C	1
	Nickel	7440-02-0	0,018	2.1.1. B	0,5
	NOX	-	4,1	2.52.1	500
	CO	630-08-0	2,3	2.52.1	500
	2.1.1 Total Class A and B		0,018		0,5
	2.1.1 Total Class A and C		0,178		1
P32	Solid material	-	1,8	2.52.1	150
	Iron	7439-89-6	1,55	2.1.1. O	50
	Manganese	7440-02-0	0,178	2.1.1. C	1
	Nickel	7440-02-0	0,018	2.1.1. B	0,5
	NOX	-	4,1	2.52.1	500
	CO	630-08-0	2,3	2.52.1	500
	2.1.1 Total Class A and B		0,018		0,5
	2.1.1 Total Class A and C		0,178		1
P33	Solid material	-	0,35	2.1.1. O	50
	Iron	7439-89-6	0,0013	2.1.1. O	50
	Manganese	7440-02-0	0,0002	2.1.1. C	1
	Nickel	7440-02-0	0,00002	2.1.1. B	0,5
	Dimethyl carbonate (DMC)	616-38-6	2,304	2.3.1 C	150
	Ethylene carbonate (EC)	96-49-1	1,152	2.3.1 C	150
	Ethyl methyl carbonate (EMC)	623-53-0	1,152	2.3.1 C	150

ID	Pollutants	CAS number	Emission concentration (mg/m³)	Classification	Emission limit value (mg/m³)
	Vinyl carbonate (VC)	872-36-6	0,23	2.5.4 C	1
	LiPF6	21324-40-3	0,115	2.1.1. C	5
	Diethylene glycol (DEG)	111-46-6	0,1493	2.3.1.C	150
	Hydrogen fluoride	7664-39-3	0,02	2.2 B	5
	2.1.1 Total Class A and B		0,00002		0,5
	2.1.1 Total Class A and C		0,1152		1
	2.3.1. Total class C		4,7573		150
P34	Solid material	-	0,35	2.1.1. O	50
	Iron	7439-89-6	0,0013	2.1.1. O	50
	Manganese	7440-02-0	0,0002	2.1.1. C	1
	Nickel	7440-02-0	0,0000168	2.1.1. B	0,5
	Dimethyl carbonate (DMC)	616-38-6	2,304	2.3.1 C	150
	Ethylene carbonate (EC)	96-49-1	1,15	2.3.1 C	150
	Ethyl methyl carbonate (EMC)	623-53-0	1,15	2.3.1 C	150
	Vinyl carbonate (VC)	872-36-6	0,23	2.5.4 C	1
	LiPF6	21324-40-3	0,115	2.1.1. C	5
	Diethylene glycol (DEG)	111-46-6	0,151	2.3.1.C	150
	Hydrogen fluoride	7664-39-3	0,017	2.2 B	5
	2.1.1 Total Class A and B		0,0000168		0,5
	2.1.1 Total Class A and C		0,1152		1
	2.3.1. Total class C		4,755		150
P35	Solid material	-	0,35	2.1.1. O	50
	Iron	7439-89-6	0,002	2.1.1. O	50
	Manganese	7440-02-0	0,0002	2.1.1. C	1
	Nickel	7440-02-0	0,0000168	2.1.1. B	0,5
	Dimethyl carbonate (DMC)	616-38-6	2,304	2.3.1 C	150
	Ethylene carbonate (EC)	96-49-1	1,152	2.3.1 C	150
	Ethyl methyl carbonate (EMC)	623-53-0	1,152	2.3.1 C	150

ID	Pollutants	CAS number	Emission concentration	Classification	Emission limit value
			(mg/m³)		(mg/m³)
	Vinyl carbonate (VC)	872-36-6	0,23	2.5.4 C	1
	LiPF6	21324-40-3	0,115	2.1.1. C	5
	Diethylene glycol (DEG)	111-46-6	0,151	2.3.1.C	150
	Hydrogen fluoride	7664-39-3	0,017	2.2 B	5
	2.1.1 Total Class A and B		0,0000168		0,5
	2.1.1 Total Class A and C		0,1152		1
	2.3.1 Total class C		4,759		150
P36	Diethylene glycol (DEG)	111-46-6	0,1488	2.3.1.C	150
P37	Dimethyl carbonate (DMC)	616-38-6	2,187	2.3.1 C	150
	Ethylene carbonate (EC)	96-49-1	1,094	2.3.1 C	150
	Ethyl methyl carbonate (EMC)	623-53-0	1,094	2.3.1 C	150
	Vinyl carbonate (VC)	872-36-6	0,219	2.5.4 C	1
	LiPF6	21324-40-3	0,109	2.1.1. C	5
	2.1.1 Total Class A and C		0,109		1
	2.3.1 Total class C		4,375		150
P38****	N-methyl-2-pyrrolidone (NMP)	872-50-4	1	2.5.6.	1
	Solid material	-	1,89	2.1.1. O	50
	Hydrogen chloride	7647-01-0	0,1	2.2 C	30
	Hydrogen fluoride	7664-39-3	0,017	2.2 B	5
P39	Solid material	-	5,28	2.1.1. O	50
	Nickel	7440-02-0	0,0777	2.1.1. B	0,5
	Cobalt	7440-48-4	0,045	2.1.1. B	0,5
	Manganese	7440-02-0	0,021	2.1.1. C	1
	Aluminium	7440-02-0	0,001	2.1.1. O	50
	Lithium	623-53-0	0,106	2.1.1. C	1
	Graphite	7782-42-5	5,032	2.1.1. O	50
	Hydrogen chloride	7647-01-0	0,1	2.2 C	30
	Hydrogen fluoride	7664-39-3	0,017	2.2 B	5

ID	Pollutants	CAS number	Emission concentration (mg/m³)	Classification	Emission limit value (mg/m³)
	CO	630-08-0	450	2.2 D	500
	NOX	-	250	2.2 D	500
	SO2	7446-09-5	200	2.2 D	500
	2.1.1 Total Class A and B		0,1227		0,5
	2.1.1 Total Class A and C		0,127		1
P40	Solid material	-	0,756	2.1.1. O	50
	Nickel	7440-02-0	0,0738	2.1.1. B	0,5
	Cobalt	7440-48-4	0,005	2.1.1. B	0,5
	Manganese	7440-02-0	0,002	2.1.1. C	1
	Aluminium	7440-02-0	0,0001	2.1.1. O	50
	Lithium	623-53-0	0,011	2.1.1. C	1
	Graphite	7782-42-5	0,52	2.1.1. O	50
	Hydrogen chloride	7647-01-0	0,1	2.2 C	30
	Hydrogen fluoride	7664-39-3	0,017	2.2 B	5
	2.1.1 Total Class A and B		0,0788		0,5
	2.1.1 Total Class A and C		0,013		1
P41	Solid material	-	0,756	2.1.1. O	50
	Nickel	7440-02-0	0,0738	2.1.1. B	0,5
	Cobalt	7440-48-4	0,005	2.1.1. B	0,5
	Manganese	7440-02-0	0,002	2.1.1. C	1
	Aluminium	7440-02-0	0,0001	2.1.1. O	50
	Lithium	623-53-0	0,011	2.1.1. C	1
	Graphite	7782-42-5	0,52	2.1.1. O	50
	Hydrogen chloride	7647-01-0	0,1	2.2 C	30
	Hydrogen fluoride	7664-39-3	0,017	2.2 B	5
	2.1.1 Total Class A and B		0,0788		0,5
	2.1.1 Total Class A and C		0,013		1
P42	Hydrogen fluoride	7664-39-3	0,017	2.2 B	5

ID	Pollutants	CAS number	Emission concentration (mg/m³)	Classification	Emission limit value (mg/m³)
	Solid material	-	15	2.1.1. O	50
P43	Dimethyl carbonate (DMC)	616-38-6	0,006	2.3.1 C	150
	Ethylene carbonate (EC)	96-49-1	0,003	2.3.1 C	150
	Ethyl methyl carbonate (EMC)	623-53-0	0,003	2.3.1 C	150
	Vinyl carbonate (VC)	872-36-6	0,001	2.5.4 C	1
	LiPF6	21324-40-3	0,0003	2.1.1. C	5
	Hydrogen fluoride	7664-39-3	0,017	2.2 B	5
	Solid material	-	0,759	2.1.1. O	50
	Nickel	7440-02-0	0,0628	2.1.1. B	0,5
	Cobalt	7440-48-4	0,005	2.1.1. B	0,5
	Manganese	7440-02-0	0,002	2.1.1. C	1
	Aluminium	7440-02-0	0,0001	2.1.1. O	50
	Lithium	623-53-0	0,01	2.1.1. C	1
	Graphite	7782-42-5	0,179	2.1.1. O	50
	Hydrogen chloride	7647-01-0	0,027	2.2 C	30
	2.1.1 Total Class A and B		0,0678		0,5
	2.1.1 Total Class A and C		0,0123		1
	2.3.1. Total class C		0,012		150
P44	CO	630-08-0	25	-	100
	NOX	-	60	-	100
P45	CO	630-08-0	25	-	100
	NOX	-	60	-	100
P46	CO	630-08-0	25	-	100
	NOX	-	60	-	100
P47	CO	630-08-0	25	-	100
	NOX	-	60	-	100
P48	CO	630-08-0	25	-	100
	NOX	-	60	-	100

ID	Pollutants	CAS number	Emission concentration (mg/m³)	Classification	Emission limit value (mg/m³)
P49	CO	630-08-0	25	-	100
	NOX	-	60	-	100
P50	Stink	-	50 SDU/m³	-	-
P51	Kitchen extraction	-	50	2.3.1 C	150
P52	Kitchen extraction	-	50	2.3.1 C	150
P53	CO	630-08-0	65	-	100*
	NOX	-	800	-	300*
	SO2	7446-09-5	7,7	-	350*
	Solid material	-	150	-	20*
P54	CO	630-08-0	65	-	100*
	NOX	-	800	-	300*
	SO2	7446-09-5	7,8	-	350*
	Solid material	-	151	-	20*

*The column has been filled in taking into account the planned amendment of Decree 4/2011 (14.I.) of the Ministry of Finance (the planned amendment has been socialised)

**Operation of the emergency diesel pumps associated with point sources P53 and P54 is planned for 0.5 hours per month as described above, in accordance with the relevant fire safety legislation. Pursuant to § 4 (13) of FM Decree 53/2017 (X. 18.), the emission limit values for stationary engines do not apply to engines with a rated thermal input of less than 1 $_{MWth}$ and a fuel consumption of less than 50 kg/h.

For point sources P1 to P44, where solid emissions are indicated, the solid emission concentration includes the amount of substances emitted as a component of the solid.

The emission values, taking into account the above statement, do not cause the emission limit values laid down in the legislation to be exceeded.

*** The NMP emission limit value given in Table 69 of the documentation for sources P3, P6-P8 shall be determined in mgC/Nm^3 taking into account the requirements of BAT 24. The carbon fraction of the NMP molecule is 0.606 (total molecular mass 99.13 g/mol, C molecule mass 60.05 g/mol), therefore the limit value or emission concentration determined according to BAT 24 is correctly 0.606 $mgC/Nm^{(3)}$.

**** The NMP emission limit value given in Table 69 of the documentation for the point source P38, given that the associated technology is not covered by COMMISSION (EU) 2020/2009 ENDORSEMENT DECISION, should correctly be determined on the basis of the relevant VM Regulation 4/2011 (14.I.). According to Annex 6, point 2.5.6 of the Regulation, the emission limit value for a substance with hazard characteristic H360D is 1 mg/m^3.

For information, the emission detection limits for substances where information is available are presented in a table below:

70. Table 1: Estimated detection limits for known components projected to be emitted at point sources

Pollutants	Detection limit	Analytical laboratory*
Aluminium	0.001 mg/m^3	0,5 µg /sample
Nickel	0.001 mg/m^3	0,005 µg /sample
Copper	0.001 mg/m^3	0,1 µg /sample
Cobalt	0.001 mg/m^3	0,003 µg /min
CO	1.3 mg/m^3	-
Dimethyl carbonate	0.05 mg/m^3	1 µg /sample
Ethylene carbonate	0.05 mg/m^3	1 µg /sample
Ethyl methyl carbonate	0.05 mg/m^3	1 µg /sample
Iron	0.001 mg/m^3	0,5 µg /sample
Hydrogen chloride	0.167 mg/m^3	0,05 µg /ml
Hydrogen fluoride	0.067 mg/m^3	0,02 µg /ml
Diethylene glycol	0.05 mg/m^3	1 µg /sample
Lithium	0.001 mg/m^3	0,03 µg /min
Manganese	0.001 mg/m^3	0,005 µg /sample
NMHC	0.4 mgC/m^3	-
(N-methyl-2-pyrrolidone) NMP	0.025 mg/m^3	0,5 µg /sample
NOx	2.1 mg/m^3	-
Solid material	0.2 mg/m^3	-
Silicon	0.001 mg/m^3	0,1 µg /sample
Sulphur dioxide	2.9 mg/m^3	-

*For solids and organic substances, the amount of pollutant collected during the emission measurement is determined by an analytical laboratory, from which the measured concentration can be calculated taking into account the volume flow rate.

The limit values for the air pollution abatement technologies tested have been set taking into account the following legal requirements. In cases where no relevant legislation was available, a limit value for a substance with similar characteristics was proposed, taking into account the hazard characteristics and chemical composition of the substance. It should be stressed that no environmental or health risk assessment could be carried out when making these proposals. It is the responsibility of the competent Department of Environment, Nature Conservation and Waste Management to determine the emission limit values actually applicable.

N-methyl-2-pyrrolidone (NMP): with regard to the emission limit values for surface treatment technology, it should be highlighted that, according to the definition of DIRECTIVE 2010/75/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on industrial emissions (integrated pollution prevention and control) (3.Article 3): 'coating' means coating as defined in Article 2(8) of Directive 2004/42/EC of the European Parliament and of the Council of 21 April 2004 on the limitation of emissions of volatile organic compounds due to the use of organic solvents in certain paints and varnishes and vehicle refinishing products (4) OJ L 143, 30.4.2004, p. 87. Organic solvents in certain paints, varnishes and

DIRECTIVE 2004/42/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the limitation of emissions of volatile organic compounds due to the use of volatile organic compounds in vehicle refinishing products and amending Directive 1999/13/EC /Article 1(1) to (2)/:

(1) The purpose of this Directive is to limit the total VOC content of certain paints, varnishes and vehicle refinishing products in order to prevent or reduce air pollution from the contribution of VOCs to tropospheric ozone formation.
(2) In order to achieve the objective set out in paragraph 1, this Directive approximates the technical specifications of certain paints, varnishes and vehicle refinishing products.
(3) This Directive shall apply to the products set out in Annex I.

The Decree 26/2014 (25.III.) does not contain a glossary of terms, so they are to be examined on the basis of the definitions of the Government Decree 25/2006 (3.II.) on the regulation of the organic solvent content of certain paints, varnishes and products for the refinishing of vehicles:

- coating material: any mixture used to form a film coating on a surface for decorative, preservative or other functional purposes, including any organic solvent or preparation containing an organic solvent for the purpose of its proper application;
- film: a continuous layer formed by the application of one or more coating materials to the surface to be painted

Based on the above, the surface treatment activity planned to be carried out in the facility is not painting, as no varnish will be used in the activity. The processes also do not involve the refinishing of vehicles, so based on the above definitions, it can be concluded that the Directive (and in line with it, the Regulation No 26/2014 (25.III.) VM) has the explicit aim of regulating certain operations on paints, varnishes and vehicle refinishing products, i.e. the application of the limits under the Regulation No 26/2014 (25.III.) VM can only be interpreted within these industries. The limit value considered for the substance is the amendment of the relevant VM Decree 4/2011 (14.I.), according to which the emission limit value for the substance with hazard characteristic H360D is 1mg/m^3.

The emission limit values for the substances envisaged to be emitted and the proposed
limit values justified as follows.

- **T1:** Cathode coating (P1, P3, P5-P8, P38 point sources)
  - : (Annex 6, Class 2.1.1 O of Decree 4/2011 (14.I.) VM Decree 6) 50 mg/m^3
  - **Nickel:** (Decree 4/2011 (14.I.) of the Ministry of Agriculture, Forestry, Environment and Water Management, Annex 6, Class 2.1.1 B) 0,5 mg/m^3
  - **Manganese:** (Annex 6, Class 2.1.1 C of Decree 4/2011 (14.I.) VM Decree 4/2011) 1 mg/m^3
  - **Cobalt:** (Decree 4/2011 (I. 14.) VM Annex 6 2.1.1 Class B) 0,5 mg/m^3
  - **Lithium:** (Decree 4/2011 (14.I.) VM Annex 6, 2.1.1 Class C) 1 mg/m^3. Rationale: Lithium is not regulated by an emission limit value. It is similar to manganese in terms of its hazard characteristics.
  - **Aluminium:** (VM Decree 4/2011 (14.I.), Annex 6, Class 2.1.1 O) 50 mg/m^3. Rationale: aluminium is not regulated by an emission limit value. hazardous characteristics from a fire safety point of view, so it is proposed to take into account the general limit value for particulate matter.

- **Graphite:** (VM Decree 4/2011 (14.I.), Annex 6, Class 2.1.1 O) 50 mg/m^3. Rationale: the graphite to be applied is not regulated by an emission limit value. It has no hazard characteristics and it is therefore proposed to use the general limit value for particulate matter.
- **Polyvinylidene fluoride (PVDF):** (Annex 6, Class 2.1.1 C of Decree 4/2011 (14.I.) VM Decree 4/2011) 5 mg/m^3. Rationale: the compound is not controlled by an emission limit value. It has no hazard characteristics, but it is a fluoride-containing compound, in view of which it is proposed to apply the limit value for readily soluble fluorides as solid components.
- **N-methyl-2-pyrrolidone (NMP):**
    - P3, P6-P8 point sources as explained above.
    - In the case of point source P38, that the related technology is not covered by COMMISSION (EU) 2020/2009 ENFORCEMENT DECISION, it should be determined on the basis of the relevant VM Regulation 4/2011 (14.I.). According to Annex 6, point 2.5.6 of the Regulation, the emission limit value for a substance with hazard characteristic H360D is 1 mg/m^3.
- **Diethylene glycol (DEG):** (Annex 6, 2.3.1, Class C of Decree 4/2011 (14.I.2011) VM Decree 4/2011) 150 mg/m^3 Rationale: the compound is not controlled by an emission limit value. Hazard characteristics (H302, H373) show similarity to butyldiglycol.

- **T2:** Anode coating (P2, P4, P9-P12 point sources)
    - : (Annex 6, Class 2.1.1 O of Decree 4/2011 (14.I.) VM Decree 6) 50 mg/m^3
    - **Silicon**: (Annex 6, Class 2.1.1 O of Decree 4/2011 (14.I.) VM Decree 4/2011) 50 mg/m^3 Rationale: silicon is not regulated by an emission limit value. hazardous characteristics from a fire safety point of view, so it is recommended to take into account the general limit value for particulate matter.
    - **Carboxymethylcellulose (CMC):** (Class 2.1.1 O, Annex 6, Class 2.1.1 of VM Decree 4/2011 (14.I.)) 50 mg/m^3. Rationale: the intended use is not controlled by an emission limit value. It no hazard characteristics and it is therefore proposed to use the general limit value for particulate matter.
    - **Diethylene glycol (DEG)**: (Annex 6, 2.3.1, Class C of Decree 4/2011 (14.I.2011) VM Decree 4/2011) 150 mg/m^3 Rationale: the compound is not controlled by an emission limit value. Hazard characteristics (H302, H373) show similarity to butyldiglycol.
    - **Polyacrylic acid (PAA)**: (Annex 6, 2.3.1, Class C of Decree 4/2011 (14.I.2011) VM Decree 4/2011) 150 mg/m^3 Rationale: the compound is not regulated by an emission limit value. Acrylic acid has an emission limit value, so it is recommended to take this into account.
- **T3:** Laser cutting (P13-P20 and P26 point sources)
    - **Aluminium:** (VM Decree 4/2011 (14.I.), Annex 6, Class 2.1.1 O) 50 mg/m^3. Rationale: aluminium is not regulated by an emission limit value. hazardous characteristics from a fire safety point of view, so it is proposed to take into account the general limit value for particulate matter.
    - **Copper:** (Decree 4/2011 (I. 14.) VM Annex 6, 2.1.1 Class C) 5 mg/m^3.
- **T4:** Welding (P30-P32 point sources)
    - **Solid material:** (Annex 7, 2.52.1 Welding, plasma cutting of Decree 4/2011 (14.I.) VM) 150 mg/m^3

- **Nickel:** (Decree 4/2011 (14.I.) of the Ministry of Agriculture, Forestry, Environment and Water Management, Annex 6, Class 2.1.1 B) 0,5 mg/m^3
- **Manganese:** (Annex 6, Class 2.1.1 C of Decree 4/2011 (14.I.) VM Decree 4/2011) 1 mg/m^3
- **Iron:** (VM Decree 4/2011 (14.I.), Annex 6, Class 2.1.1 O) 50 mg/m^3. Rationale: iron is not regulated by an emission limit value. hazardous characteristics from a fire safety point of view, so it is recommended to take into account the general limit value for particulate matter.
- **Carbon monoxide:** (Annex 7 2.52.1 Welding, plasma cutting of Decree 4/2011 (I. 14.) VM) 500 mg/m^3
- **Nitrous oxides:** (Annex 7 2.52.1 Welding, plasma cutting of Decree 4/2011 (14.I.) VM) 500 mg/m^3

- **T5:** Battery cell production (P21-P29, P33-P37, P40-P41, P43 point sources)
  - : (Annex 6, Class 2.1.1 O of Decree 4/2011 (14.I.) VM Decree 6) 50 mg/m^3
  - **Nickel:** (Annex 6, Class 2.1.1, Class B of Decree 4/2011 (14.I.) VM Decree 4/2011) 0,5 mg/m^3
  - **Manganese:** (Annex 6, Class 2.1.1 C of Decree 4/2011 (14.I.) VM Decree 4/2011) 1 mg/m^3
  - **Iron:** (VM Decree 4/2011 (14.I.), Annex 6, Class 2.1.1 O) 50 mg/m^3. Rationale: iron is not regulated by an emission limit value. hazardous characteristics from a fire safety point of view, so it is recommended to take into account the general limit value for particulate matter.
  - **Aluminium:** (VM Decree 4/2011 (14.I.), Annex 6, Class 2.1.1 O) 50 mg/m^3. Rationale: aluminium is not regulated by an emission limit value. hazardous characteristics from a fire safety point of view, so it is proposed to take into account the general limit value for particulate matter.
  - **Carbon monoxide:** (Annex 6, Class 2.2 D of Decree 4/2011 (14.I.) VM Decree 6) 500 mg/m^3
  - **Nitrogen oxides:** (Annex 6, Class 2.2 D of Decree 4/2011 (14.I.) VM Decree 6) 500 mg/m^3
  - **Paraffinic hydrocarbons other than methane (NMHC):** (Decree 4/2011 (I. 14.) VM 6. Annex 2.3.1 Class C) 150 mg/m^3.
  - **Diethylene glycol (DEG)**: (Annex 6, 2.3.1, Class C of Decree 4/2011 (14.I.2011) VM Decree 4/2011) 150 mg/m^3 Rationale: the compound is not controlled by an emission limit value. Hazard characteristics (H302, H373) show similarity to butyldiglycol.
  - **Lithium hexafluorophosphate:** (Class C, Annex 6, 2.1.1.1 of Decree 4/2011 (14.I.) VM Decree 4/2011) 5 mg/m^3. Rationale: the compound is not controlled by an emission limit value. Taking into account its hazard characteristics (H301, H361f, H411) and the fluorine component, it is proposed to use the limit value for readily soluble fluorides as solid components.
  - **Dimethyl carbonate (DMC):** (Annex 6, Class 2.3.1 C of VM Decree 4/2011 (14.I.)) 150 mg/m^3. Rationale: the compound is not controlled by an emission limit value. Its chemical composition and hazard characteristics are similar to those of methyl ethyl ketone, in view of which the above limit value is proposed.
  - **Ethylene carbonate (EC):** (Annex 6, Class 2.3.1, Class C, of Regulation (**EU)** No 4/2011 (14.I.) VM, Annex 6) 150 mg/m^3. Its chemical composition and hazard characteristics are similar to those of methyl ethyl ketone, in view of which the above limit value is proposed.
  - **Ethyl methyl carbonate (EMC):** (Annex 6, Class 2.3.1 C of Decree 4/2011 (14.I.) of the Ministry of Transport and Communications, Annex 6) 150 mg/m^3. Rationale: the compound is not controlled by an emission limit value. Chemical composition and

has similar hazard characteristics to methyl ethyl ketone, in view of which the above is recommended.

  - **Hydrogen fluoride:** (Decree 4/2011 (14.I.) VM Annex 6, Class 2.2 B) 5 mg/m^3.
  - **Hydrochloric acid:** (Annex 6, Class 2.2 C of Decree 4/2011 (14.I.) VM Decree 4/2011) 30 mg/m^3.
  - **Vinyl carbonate (VC):** (Annex 6, Class 2.5.4 C of VM Decree 4/2011 (14.I.)) 1 mg/m^3. Rationale: the compound is not controlled by an emission limit value. Its chemical composition and hazard characteristics are similar to vinyl chloride, in view of which the above limit value is proposed.
  - **Lithium:** (Decree 4/2011 (14.I.) VM Annex 6, 2.1.1 Class C) 1 mg/m3 Rationale: Lithium is not regulated by an emission limit value. It is similar to manganese in terms of its hazard characteristics.
- **T6:** Waste management (P39-P42 point sources)
  - : (Annex 6, Class 2.1.1 O of Decree 4/2011 (14.I.) VM Decree 6) 50 mg/m^3
  - **Nickel:** (Annex 6, Class 2.1.1, Class B of Decree 4/2011 (14.I.) VM Decree 4/2011) 0,5 mg/m^3
  - **Manganese:** (Annex 6, Class 2.1.1 C of Decree 4/2011 (14.I.) VM Decree 4/2011) 1 mg/m^3
  - **Aluminium:** (VM Decree 4/2011 (14.I.), Annex 6, Class 2.1.1 O) 50 mg/m^3. Rationale: aluminium is not regulated by an emission limit value. hazardous characteristics from a fire safety point of view, so it is proposed to take into account the general limit value for particulate matter.
  - **Lithium:** (Decree 4/2011 (14.I.) VM Annex 6, 2.1.1 Class C) 1 mg/m^3. Rationale: Lithium is not regulated by an emission limit value. It is similar to manganese in terms of its hazard characteristics.
  - **Cobalt:** (Decree 4/2011 (I. 14.) VM Annex 6 2.1.1 Class B) 0,5 mg/m^3
  - **Graphite:** (VM Decree 4/2011 (14.I.), Annex 6, Class 2.1.1 O) 50 mg/m^3. Rationale: the graphite to be applied is not regulated by an emission limit value. It has no hazard characteristics and it is therefore proposed to use the general limit value for particulate matter.
  - **Carbon monoxide:** (Annex 6, Class 2.2 D of Decree 4/2011 (14.I.) VM Decree 6) 500 mg/m^3
  - **Nitrogen oxides:** (Annex 6, Class 2.2 D of Decree 4/2011 (14.I.) VM Decree 6) 500 mg/m^3
  - **Sulphur dioxide:** (Annex 6, Class 2.2 D of Decree 4/2011 (14.I.) VM Decree 4/2011) 500 mg/m^3
  - **Hydrogen fluoride:** (Decree 4/2011 (14.I.) VM Annex 6, Class 2.2 B) 5 mg/m^3.
  - **Hydrochloric acid:** (Annex 6, Class 2.2 C of Decree 4/2011 (14.I.) VM Decree 4/2011) 30 mg/m^3.
- **T7:** Wastewater treatment extraction (P50 point source)
  - **Odour emissions:** not controlled by an emission limit value, only by an immission limit value. (VM Decree 4/2011 (14.I.), Annex 2, Table 3, point 23) 1,5 odour units/m^3
- **T8:** Kitchen exhaust (P51-P52 point sources)
  - **Kitchen extraction (oils, fats)** (Annex 6, 2.3.1, Class C of Decree 4/2011 (14.I.) VM Decree 4/2011) 150 mg/m^3. Rationale: kitchen extraction is not regulated by an emission limit value. It is proposed to assign a limit value taking into account paraffinic hydrocarbons as a group of substances.
- **T9:** Heat supply (P44-P49 point sources)
  - **Carbon monoxide:** (Annex 5, point 2 of Decree 53/2017 (X. 18.) FM No. 53/2017) 100 mg/Nm^3

- **Nitrogen oxides:** (Annex 5, point 2 of Decree 53/2017 (X. 18.) FM No. 53/2017) 100 mg/Nm^3
- **Sulphur dioxide:** (Annex 5, point 2 of Decree 53/2017 (X. 18.) FM) 35 mg/Nm^3
- **Solids**: (Annex 5, point 2 of Decree 53/2017 (X. 18.) FM No. 53/2017) 5 mg/Nm^3
- Comment:
  - the limits above 273,15 K for flue gas with a temperature of 101,3 kPa apply with a reference oxygen content of 3 tf%

- **T10:** Diesel pumps (P53-P54 point sources)
  - **Carbon monoxide:** (Annex 5, point 2 of Decree 53/2017 (X. 18.) FM No. 53/2017) 100 mg/Nm^3
  - **Nitrogen oxides:** (Annex 5, point 2 of Decree 53/2017 (X. 18.) FM No. 53/2017) 300 mg/Nm^3
  - **Sulphur dioxide:** (Annex 5, point 2 of Decree 53/2017 (X. 18.) FM No. 53/2017) 350 mg/Nm^3
  - **Solids**: (Annex 5, point 2 of Decree 53/2017 (X. 18.) FM No. 53/2017) 20 mg/Nm^3
  - Comment:
    - the above limits apply to a flue gas at 273,15 K and 101,3 kPa pressure, taking into account a reference oxygen content of 15 % by volume
    - in accordance with § 4, paragraph 13, for stationary engines, the emission limit values do not apply to engines with a rated thermal input of less than 1 $_{MWth}$ and a fuel consumption of less than 50 kg/h

With regard to T9 technology, it should be pointed out that it is not technically possible to connect the boilers to a chimney as follows:

- Pressurised fired boilers (and steam boilers in particular) are very sensitive to changing draught conditions. In the case of boilers connected to a common chimney, different draught conditions arise due to varying thermal output (modulation), different flue resistances, different operating modes. In the case of a common chimney, malfunctions and operational problems may occur due to the interaction of the boilers on the flue gas side.
- In the case of a common chimney, it is common that if one of the boilers is not working, the chimney flue can flush (cool down) the associated flue, ECO (heat recovery) and boiler firebox. When the boiler restarts, the risk of condensation and the corrosion it causes is significantly increased. It takes longer to reach the optimum draught conditions and boiler operation, which would lead to a reduction in efficiency.
- In the case of a common stack, the required stack cross-section shall be determined taking into account the full load condition (maximum flue gas flow) of all connected boilers. In the operating condition where only 1 boiler is operating at part load, the flue gas leaving the boiler will exit through the common flue at a significantly lower rate. The low flue gas velocity reduces the projection distance at the exit point of the stack and increases the area of influence of the pollutants leaving. The lower velocity of the flue gas leads to a higher amount of condensate precipitation, which places a higher load on the duct network.
- In the case of separate chimneys, the cleaning and maintenance of a chimney belonging to one boiler can be carried out without affecting the operation of the other boilers. In the case of a common chimney, cleaning and maintenance can be considerably more complicated, as the boilers have to be shut down as a unit.
- The chimneys of each boiler may require a separate maintenance schedule depending on the operating hours and operating conditions of the boilers. In the case of a common chimney, maintenance cannot be managed separately.

- When dealing with an emergency situation, if a chimney fails, only the boiler associated with it needs to be shut down. In the case of a common chimney, the entire system must be shut down, which reduces operational safety.

In view of the above, the connection of the boilers to a common chimney is not planned and is not technically feasible while maintaining operational safety. The BAT conclusions set out in the relevant COMMISSION (EU) 2017/1442 EXECUTIVE DECISION apply to the following activities, as set out in Annex I to Directive 2010/75/EU, which are relevant in this case:

- 1.1 The combustion of fuels in installations with a total rated thermal input of 50 $_{MWth}$ or more, only where this activity takes place in combustion plants with a total rated thermal input of 50 $_{MWth}$ or more.

that the rated thermal input of the boilers is less than 50 MWth per installation and that it is not technically feasible to connect the installations in a single stack, and therefore the co-calculation rule does not apply, COMMISSION DECISION (EU) 2017/1442/EC does not apply to the boilers planned to be installed in the installation.

Characteristics of pollutants emitted

The general characteristics of the pollutants emitted are presented in the following table.

71. Table 1: Characteristics of pollutants emitted

Polluting substance	CAS number	General information, health effects
Stationary powder	-	The long-term effects of outdoor air particulate matter include: significant reductions in life expectancy due to cardiovascular and respiratory diseases, and lung cancer due to an increase in mortality. Literature evidence suggests that traffic-related air pollution (including particulate matter) among people living along busy roads has a greater potential for adverse effects.
Nitrogen dioxide	10102-44-0	Nitrogen dioxide is an irritant gas. Nitrogen dioxide and other the relationship between air pollutants (particulate matter and ozone) is complex, making it very difficult to assess the isolated effects of $_{NO2}$ in epidemiological studies. For this reason, the health effects of $_{NO2}$ are mainly was determined based on the results of animal studies. Nitrogen dioxide and its reaction products cause reduced lung function and an increased risk of various respiratory symptoms. Extremely high concentrations the airways narrow in both asthmatic and non-asthmatic individuals. However, people with asthma are more sensitive to nitrogen dioxide than healthy people. It has been shown that more people living along busy roads become asthmatic. Nitrogen oxides high concentrations are likely to contribute to heart and lung diseases and reduces the body's resistance to respiratory infections.
Polluting substance	CAS number	General information, health effects

Carbon monoxide	630-08-0	Carbon monoxide is a colourless and odourless reducing gas. It is produced the incomplete combustion of carbon compounds, mainly in internal combustion is generated in engines. An indicator parameter for air pollution from traffic. Carbon monoxide weakens the blood's ability to carry oxygen and can cause oxygen deficiency. Symptoms of carbon monoxide poisoning include headache, vomiting, unconsciousness and death in severe cases - although the effects of short-term exposure can be reversed. Symptoms of chronic effects include headache, dizziness, insomnia, heart pain, nervous system symptoms, increased incidence of heart attacks.
Sulphur dioxide	7446-09-5	Sulphur dioxide (SO_2) is mainly produced when fossil fuels containing sulphur are burned. The main emitters are the energy industry, coal combustion and road transport. Breathing in high concentrations of sulphur dioxide causes a spasmodic condition of the airways. People with asthma react more violently than healthy people. Sulphur dioxide agitates the respiratory system, causing bronchoconstriction and reduced lung function causes.
N-methyl-2-pyrrolidone (NMP)	872-50-4	It is a skin irritant. Causes severe eye irritation. May cause respiratory irritation. It can harm the unborn child.
Dimethyl carbonate (DMC)	616-38-6	Flammable liquid, vapours may form explosive mixture with air. Inhalation may cause irritation, intoxication can cause.
Ethyl methyl carbonate (EMC)	623-53-0	Highly flammable liquid and vapour. Does not contain ingredients that are persistent, bioaccumulative and toxic (POPs) or very persistent in the environment residual very bioaccumulative (vPvB) material can be considered at concentrations of 0.1% or more.
Ethylene carbonate (EC)	96-49-1	Harmful if swallowed.Causes severe eye irritation. Repeated or prolonged exposure may cause damage to organs (kidneys) if swallowed. the raw material/mixture does not contain ingredients which are persistent, very bioaccumulative and toxic (POPs) or very persistent very bioaccumulative (vPvB) substances at or above 0,1 % of in higher concentrations.

Polluting substance	CAS number	General information, health effects
Cobalt	7440-48-4	Cobalt is found in various ores and is a constituent of alloys; its compounds are commonly used in inks, paints and varnishes. Harmful if swallowed. Inhaled, it is deadly. Causes severe eye irritation. Inhalation may cause allergic and asthma symptoms and difficulty breathing. It can cause an allergic skin reaction. It is thought to cause genetic damage. Can cause cancer. Can damage fertility. Repeated or
		may cause organ damage after prolonged exposure. Very toxic to aquatic life, causing long-term damage.
Nickel	7440-02-0	Nickel and its compounds are toxic. It can cause an allergic skin reaction. It may cause cancer. Damage to organs (lungs) through repeated or prolonged exposure by inhalation. Harmful to aquatic life, causes long-term damage.
Manganese	7439-96-5	Manganese dust can affect the lungs and central nervous system if inhaled for long periods. It can cause bronchitis, pneumonia and nervous system disorders.
Hydrogen fluoride	7664-39-3	A pungent smelling, colourless, corrosive gas or liquid. Inhalation of the gas or vapour can cause pulmonary oedema, asthma-like reaction (RADS), swelling of the throat can cause choking, pneumonia.
Hydrogen chloride	7647-01-0	Causes severe burns and eye damage. May cause respiratory tract irritation. It can be corrosive to metals.
Aluminium	7429-90-5	This substance does not contain endocrine disrupters at levels equal to or higher than 0.1% in accordance with Article 57f) of REACH, Commission Delegated Regulation (EU) 2017/2100 or Commission Regulation (EU) Commission Regulation 2018/605.
Lithium	7439-93-2	In contact with water, it emits flammable gases which are liable to spontaneous combustion. Causes severe burns and eye damage. The material/mixture does not contain ingredients which are persistent, bioaccumulative and toxic (PTB) or very persistent very bioaccumulative (vPvB) are considered to be substances at concentrations of 0.1% or more.
$LiPF_6$	21324-40-3	Flammable liquid and vapour. Harmful if swallowed. Skin irritant.Causes severe eye irritation. Inhalation exposure over repeated or prolonged exposure may cause damage to organs (bones, teeth). may cause damage to organs (kidneys) if ingested after prolonged exposure.

Graphite	7782-42-5	It is not considered a hazardous substance or mixture under EC Regulation 1272/2008. The raw material/mixture does not contain any components that are persistent in the environment, very persistent very bioaccumulative and toxic (PTB) or very persistent very bioaccumulative (vPvB) can be considered at concentrations of 0.1% or more.
Polyvinylidene fluoride (PVDF)	24937-79-9	It is not considered a hazardous substance or mixture under EC Regulation 1272/2008. The raw material/mixture does not contain any components that are persistent in the environment, very bioaccumulative and toxic (PTB) or very persistent
Polluting substance	**CAS number**	**General information, health effects**
		are considered to be very persistent bioaccumulative (vPvB) at concentrations of 0.1% or more.
Silicon	7440-21-3	Flammable solid. The raw material/mixture does not contain components which are persistent in the environment, very persistent very bioaccumulative and toxic (PTB) or very persistent very bioaccumulative (vPvB) can be considered at concentrations of 0.1% or more.
Carboxymethyl cellulose (CMC)	9004-32-4	Carboxymethyl cellulose (CMC), also known as cellulose gum, is not a battery but a water-soluble polymer derived from cellulose, which is used in the natural polysaccharide found in cell walls. It is not classified as a hazardous substance under EC Regulation 1272/2008 or a mixture of.
Copper	7440-50-8	Flammable solid. Self-heating: may ignite. Very toxic to aquatic life. Very toxic to aquatic life, persistent causes permanent damage.
Iron	7439-89-6	Flammable solid. Self-heating: may ignite.
Vinyl carbonate (VC)	872-36-6	Vinyl carbonate (VC) is an organic carbonate ester used as an electrolyte additive in lithium-ion batteries and in various organic synthesis processes. It is harmful if ingested. Toxic in contact with skin. Skin irritant. Causes severe eye damage.Allergic may cause a skin reaction. Repeated or prolonged exposure may cause damage to organs if ingested. Toxic to aquatic life, may cause long-term exposure causes permanent damage.

Polyacrylic acid (PAA)	9003-01-4	Polyacrylic acid (PAA) is a so-called superabsorbent polymer (SAP). Its most significant property is its high moisture-binding capacity (it can bind up to 30 times its own weight). It is a flammable material, and in the event of fire it can produce dangerous combustible gases or vapours. It is not considered a dangerous substance or mixture under EC Regulation 1272/2008. This substance/mixture does not contain any ingredients with endocrine disrupting properties at levels of 0.1% or higher according to REACH Regulation 57. Article 2(f) of Commission Delegated Regulation (EU) 2017/2100 Commission Regulation or Commission Regulation (EU) 2018/605
Diethylene glycol (DEG)	111-46-6	Diethylene glycol is an organic compound. It is a colourless, practically odourless and hygroscopic liquid with a sweet taste. In water, alcohol, ether, in acetone and ethylene glycol. Widely used solvent. Harmful if swallowed. Vapours are heavier than air and can spread along the floor. When heated intensely, it forms explosive mixtures with air. In the event of fire, dangerous combustible gases or develop vapours. This material does not contain any ingredients, which have endocrine disrupting properties at levels equal to or higher than 0.1% in accordance with Article 57f) of REACH, Commission Delegated Regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605.

Polluting substance	**CAS number**	**General information, health effects**

The overall environmental impact of the substances released is summarised in the table below. The extent of the impact depends significantly on the level of air pollution generated.

72. Table 1: Quality characterisation of pollutants emitted

Polluting substance	**CAS number**	**Quality characterisation, environmental impact**
Stationary powder	-	Particles of airborne particulate matter enter the air and become easily inhaled. Fine particles that are smaller than 10 micrometres (PM_{10}) and 2.5 micrometres ($PM2_{.5}$) can penetrate deep into the lungs and even enter the bloodstream. Particulate matter is worse air quality and can have negative effects on human health, particularly on the respiratory system. The deposition/leaching of particulate matter can damage vegetation, soils and water bodies. If it accumulates in large quantities on plants or in soil, it can can inhibit photosynthesis and reduce plant growth and yield. If released into water bodies, it can affect water quality. Particulate matter deposited on surfaces can damage buildings and infrastructure. The fine particles can lead to oxidation and corrosive effects, resulting in buildings their surfaces are worn or damaged.

Nitrogen dioxide	10102-44-0	Nitrogen dioxide in high concentrations can cause irritation of the respiratory system, coughing, breathing difficulties, asthma symptoms and even respiratory diseases in the longer term. Nitrogen dioxide in the atmosphere can form nitric acid or nitric-malic acid. These substances can contribute to the formation of acidification, which can damage habitats, soils, water bodies and vegetation. Nitrogen dioxide plays an important role in ozone formation. The presence of ozone in the lower atmosphere can have negative effects on human health and vegetation. High ozone concentrations can damage the lungs, cause irritation of the respiratory system and may reduce photosynthesis in plants. A greenhouse gas that contributes to climate change. Rising temperatures can have adverse effects on living organisms, the habitats and weather conditions.
Carbon monoxide	630-08-0	Carbon monoxide (CO) is a colourless, odourless and tasteless gas that is toxic to humans and animals in high concentrations. It is a carbon-containing materials such as fossil fuels are deficient

Polluting substance	**CAS number**	**Quality characterisation, environmental impact**
		the product of burning. CO is less soluble in water and does not or persist in aquatic systems. CO has no direct effect on soil quality as it is a gas at ambient temperatures and does not enter the water interact significantly with soil components. CO is a significant air pollutant with direct health consequences. It binds more readily to haemoglobin in the blood than oxygen, reduces the oxygen-carrying capacity of the blood and leads to oxygen deficiency in the in body tissues (a condition known as carboxyhemoglobinemia). CO particularly dangerous in enclosed spaces where it can accumulate to toxic levels, for example from faulty furnaces, gas heaters or car exhaust garages. In outdoor environments, CO can, under certain conditions can contribute to urban smog. Although it is not a greenhouse gas, it can have indirect effects on atmospheric chemistry, such as methane and by affecting ground-level ozone levels.
Sulphur dioxide	7446-09-5	Sulphur dioxide inhaled into the air can cause irritation and respiratory problems. Sulphur dioxide and water vapour in the air can react to form sulphuric acids, such as sulphuric acid. These substances contribute to environmental acidification, which can have negative impacts on habitats, soils, water bodies and vegetation. Environmental acidification lowers soil pH, which can damage plant root systems, affect the water quality and damage the environment.

N-methyl-2-pyrrolidone (NMP)	872-50-4	Inhalation, contact with skin or ingestion of organic solvents may cause health effects. Release of organic solvents into soil or water bodies can harm living organisms and water quality. If organic solvents are released into the soil, soil fertility and plant growth can be reduced. Organic solvents can contaminate aquifers and have toxic effects on aquatic life, especially fish and other aquatic life.
Dimethyl carbonate (DMC)	616-38-6	
Ethyl methyl carbonate (EMC)	623-53-0	
Ethylene carbonate (EC)	96-49-1	
Cobalt	7440-48-4	They can have toxic effects on human health if they enter the respiratory system. High concentrations of heavy metals can cause irritation, respiratory diseases and, in the longer term, damage to the nervous system. Heavy metals in some actors in the food chain can accumulate. Heavy metals can accumulate in the soil, can have adverse effects on soil quality and vegetation health. High concentrations of heavy metals in soil can inhibit plant growth and development and reduce yields. A heavy metal releases into water can cause serious damage to living organisms and
Nickel	7440-02-0	
Manganese	7439-96-5	
Polluting substance	**CAS number**	**Quality characterisation, environmental impact**
		for ecosystems. Aquatic organisms such as fish, shellfish and crabs are highly sensitive to heavy metals.
Hydrogen fluoride	7664-39-3	Hydrogen fluoride can react acidically with water vapour in the environment to form hydrogen fluoride and hydrogen perfluoride. These substances can contribute to environmental acidification, which can damage habitats, soils, water bodies and vegetation. Environmental acidification can have negative impacts on ecosystems. A hydrogen fluoride can react with materials in the environment, such as metals and glass. This can damage buildings, the infrastructure and the immediate environment.

Hydrogen chloride	7647-01-0	As a gas, hydrogen chloride can be released into the atmosphere through various industrial processes. When released into the atmosphere, it can combine with water vapour to form hydrochloric acid, contributing to acid deposition ('acid rain') when it falls back to the earth's surface. Acid rain can damage aquatic ecosystems, soils, vegetation and buildings. Hydrochloric acid very soluble in water. When added to water bodies, it can lower the pH of the water, making it acidic. This can have detrimental effects on aquatic life, potentially leading to the death of fish and other organisms, and upsetting the balance of aquatic ecosystems. Acidic solutions such as hydrochloric acid, hydrochloric acid can lead to soil acidification if spilled or disposed of on land. Acidified soil can damage the plant by altering the availability of nutrients and can release toxic metals into the soil, which can then be plants can take up or release into groundwater.
Aluminium	7429-90-5	Aluminium is the most abundant metal in the Earth's crust and is naturally found in the environment in combination with other elements such as oxygen and silicon to form aluminium compounds, including alumina and aluminium silicates. These compounds are generally inert and do not pose a significant environmental risk. However, when aluminium is released into the environment in ionic form, typically as a result of human activity, its can have different impacts on water, soil and air quality. From aluminium can be toxic to fish and other aquatic organisms, especially in its ionic form ($Al^{(3+)}$)). This can interfere with fish gill function, leading to respiratory problems and other can also affect physiological processes. Aluminium compounds can contribute to water turbidity by precipitating out of solution, which can affect light penetration and consequently the process of photosynthesis in aquatic ecosystems. Aluminum is an element of the main constituent of clay minerals, under neutral pH conditions
Polluting substance	**CAS number**	**Quality characterisation, environmental impact**
		relatively inert. However, in acidic soils, aluminium ions can become more mobile and toxic to plants, which can inhibit root growth and nutrient uptake. Aluminium does not under normal environmental conditions, but may be present in the air as fine particles from natural sources (e.g. dust) or from industrial activities. Inhalation of fine aluminium dust may pose a health risk, especially in occupational settings. Indirect exposure to aerosols containing aluminium can affect the climate by influencing the cloud formation and the Earth's radiation balance.

Lithium	7439-93-2	Lithium in its pure elemental form is highly reactive and does not occur naturally in the environment. Instead, it occurs in complex forms such as found in lithium salts (e.g. lithium carbonate, lithium chloride). When considering the environmental impact of lithium, it is important to consider these compounds, not the pure element. A Lithium compounds can be toxic to aquatic organisms in high concentrations. Although lithium is not as toxic as heavy metals, it can disrupt aquatic ecosystems if released in significant quantities. Lithium is not as susceptible to bioaccumulate like other elements such as mercury or lead. However, it can still be present in the aquatic environment and potentially affect organisms over time. Lithium can affect plant growth if present in high concentrations in soil. It can compete with other essential nutrients such as potassium and magnesium, leading to deficiencies and can affect the health of plants.
$LiPF_6$	21324-40-3	$LiPF_6$ is highly reactive in contact with water, releasing hydrogen fluoride (HF) and phosphoric acid (H_3PO_4). Both by-products are corrosive and can be toxic to aquatic life and harmful to human health if ingested. The release of HF and H_3PO_4 can affect the pH of water bodies can also lead to a reduction in water quality, making the water more acidic, which can negatively affect aquatic ecosystems. Similar to its effect on water, $LiPF_6$ can increase soil acidity by increasing HF and H_3PO_4 due to the formation of. This can lead to soil degradation and can affect the plant growth and health.
Graphite	7782-42-5	Graphite particles can physically pollute water bodies if released in significant quantities. This can affect water clarity and quality, although it is not known to be toxic to aquatic life. Like other insoluble particles, graphite can contribute to sediment loading to water bodies, which can affect aquatic habitats and
Polluting substance	**CAS number**	**Quality characterisation, environmental impact**
		the organisms living there. The graphite particles are part of the soil composition can become part of. Because it is chemically inert, graphite typically does not react with other soil constituents and does not significantly alter the soil chemistry. Graphite is relatively inert and does not dissolve easily in water, and does not react with other substances in the environment. It is therefore not considered a significant chemical pollutant. Graphite particles in water or physical presence in the air can, however, lead to environmental concerns

		that need to be addressed, in particular the potential health risks associated with the inhalation of fine particles to prevent.
Polyvinylidene fluoride (PVDF)	24937-79-9	If PVDF materials are not properly disposed of, they can contribute to physical pollution in the form of plastic debris, which can be harmful to aquatic life. PVDF is resistant to solvents and other chemicals, which means it does not break down or dissolve easily in water. As a result, it is not a significant source of chemical water pollution under normal conditions. Similar to its behaviour in water, PVDF is chemically inert and does not readily degrade, so it does not contribute to soil contamination through chemical leaching. When PVDF is burned at high temperatures, it can release hydrogen fluoride (HF) and other potentially toxic gases. However, PVDF is typically stable and can be used in normal does not emit volatile organic compounds (VOCs) under certain conditions.
Silicon	7440-21-3	Silicon is the second most abundant element in the Earth's crust. High is not found in nature in its pure elemental form because of its reactivity; instead, it is typically found as silicon dioxide (SiO_2) or various silicate minerals. Silicon dioxide in water is poorly soluble and therefore does not typically contribute to water pollution in the same way as soluble substances. Under normal conditions it does not significantly changes the chemistry of water bodies. Silica can contribute to sediment loading in water bodies, particularly through natural erosion or human activities that disturb the soil. However, this is a physical rather than chemical form of pollution. Silicon is a major component of many types of soil, being part of the mineral structure of most rocks. It is essential for soil formation and contributes to its mineral content. Silica is beneficial to plant health, contributes to the strength and stability of plant tissues and stiffness. It can also help plants resist pests and diseases. The fine silica particles, especially in inhalation of crystalline silica for respiratory diseases such as can lead to silicosis. Silicon dioxide powder can reduce the

Polluting substance	CAS number	Quality characterisation, environmental impact
		visibility and can contribute to fog, especially in dry areas or areas where there is a lot of construction or industrial activity.
Carboxymethyl cellulose (CMC)	9004-32-4	Carboxymethyl cellulose (CMC), also known as cellulose gum, is not a battery but a water-soluble polymer derived from cellulose, which is used in the natural polysaccharide found in cell walls. CMC is biodegradable and generally non-toxic to aquatic life. The water treatment in installations or natural water systems are broken by microorganisms. In large quantities, CMC can increase the viscosity of water, which can affect the movement of aquatic organisms and feeding. However, such scenarios are unlikely under normal environmental conditions. CMC is sometimes used as a soil amendment used to improve soil structure and water retention. It can be beneficial for plant growth by improving the soil's ability to retain water and nutrients. CMC is considered environmentally friendly due to its biodegradability and non-toxic nature. It is not known pose a significant risk if used and disposed of properly. on water, soil or air quality.
Copper	7440-50-8	Copper is found in the earth's crust, in water bodies and in living in organisations. In small amounts it is an essential nutrient for plants and animals, but in higher concentrations it can be toxic and can contribute to environmental pollution. Thus, copper can affect the quality of water, soil and air. Toxicity to aquatic life: copper is more toxic to aquatic organisms than lithium. Elevated levels of copper can harm fish and invertebrates by damaging their gills and affecting their nervous systems. It can also disrupt the reproductive cycles of aquatic life. Copper can accumulate in the tissues of aquatic organisms, leading to higher concentrations in the in the food chain, which can affect predators, including humans. Copper in certain concentrations can act as an algaecide, killing algae and potentially leading to imbalances in aquatic ecosystems. Copper is an essential micronutrient for plants, but excessive levels in soil can be detrimental to plant health, leading to can cause stunted growth and other physiological problems. High concentrations of copper can be toxic to soil microorganisms, which are key to nutrient cycling and soil health. This can affect soil fertility and changes in soil structure.

Iron	7439-89-6	Iron is the fourth most abundant element in the earth's crust and is essential for many biological processes. It is generally less toxic than many other metals, and is essential for plant and animal life. A
Polluting substance	**CAS number**	**Quality characterisation, environmental impact**
		However, excess iron in the environment can still affect water, soil and air quality. Excess iron in water bodies can lead to the formation of iron oxides, which can precipitate and can reduce oxygen levels in the water. This process can affect aquatic life, especially in stagnant or slow-moving waters. High concentrations of iron can give water a reddish or orange colour, often due to natural iron deposits or industrial discharges areas. This can affect the aesthetic quality of water and interfere with light penetration, affecting photosynthesis in aquatic ecosystems. Iron is a micronutrient for plants and its presence is crucial for chlorophyll formation. However, excessive iron in the soil can lead to nutrient imbalances and can affect other essential the availability of nutrients such as phosphorus. Iron oxides are important for soil structure because they can bind particles together. However, too much iron can lead to soil hardening and reduced can lead to porosity, which affects water infiltration and root growth.
Vinyl carbonate (VC)	872-36-6	Vinyl carbonate (VC) is an organic carbonate ester used as an electrolyte additive in lithium-ion batteries and in various organic synthesis processes. VC is soluble in water and breaks down into smaller organic compounds upon hydrolysis. Depending on the concentration and depending on the circumstances, these breakdown products have the potential to affect water quality. Although specific toxicity data for VC may be limited, as with many organic compounds high concentrations can be harmful to aquatic organisms. It is important to prevent significant amounts of VC from entering water bodies. In soil, VC can be biodegraded by soil microorganisms. If VC or its degradation products are present in high concentrations, they have the potential to affect soil quality and plant growth. However, this usually only occurs in the vicinity of spills or inappropriate disposal. Problems. VC is a volatile organic compound and may contribute to the air pollution if released into the atmosphere in significant quantities. THE VOC- can be involved in reactions that form ground-level ozone and smog.

Polyacrylic acid (PAA)	9003-01-4	Polyacrylic acid (PAA) is a synthetic, high molecular weight polymer of acrylic acid and is widely used in various industries to absorb and retain water and to form gels. the environmental effects of polyacrylic acid depend on a number of factors, including concentrations, the local environment and the risks of disposal or
Polluting substance	**CAS number**	**Quality characterisation, environmental impact**
		how to manage. Here are some possible environmental effects of polyacrylic acid: Water: polyacrylic acid is used in water treatment processes and personal care products. It has low toxicity to aquatic life. A However, high concentrations of PAAs in water bodies can potentially affect the physical properties of water, such as viscosity, which can affect aquatic organisms. It is biodegradable under aerobic conditions, but the rate of biodegradation may vary depending on environmental conditions. Air: Polyacrylic acid is not volatile and therefore is not typically released into the air in significant quantities. It is therefore not considered a significant air pollutant. However, during its production or thermal decomposition, volatile organic compounds (VOCs) or other harmful substances may be released into the air. into the atmosphere. Soil: When PAA enters the soil, it can increase the water-holding capacity of the soil due to its hydrophilic nature. Although this may be beneficial in some agricultural applications, excessive amounts may alter the soil properties and potentially affect the soil microorganisms and plant growth. PAA is biodegradable in soil, but like water, biodegradation can be influenced by many factors, such temperature, microbial activity and the presence of oxygen.

Diethylene glycol (DEG)	111-46-6	Diethylene glycol (DEG) is an organic compound used as a solvent, wetting agent and intermediate in the production of various chemicals and products. Like all chemicals, DEGs can have environmental impacts depending on their concentration and the context in which they are released. Water: DEG is soluble in water and can contaminate water if not handled properly. It has moderate to low acute toxicity to aquatic life, but high concentrations can be harmful. DEG may also contribute to the biological oxygen demand (BOI) of water bodies, which is potentially lead to oxygen deficiency, which can have adverse effects on aquatic organisms. Biodegradable under aerobic conditions, but the rate of degradation may vary depending on environmental factors. Air: DEG a low vapour pressure, which means that it does not evaporate easily into the atmosphere under normal conditions. It is therefore not normally found as a pollutant in the air. It is normally not airborne in normal conditions. processes or in the case of spills exposed to high temperatures, however, DEG can be released into the air and contribute to air pollution.
Polluting substance	**CAS number**	**Quality characterisation, environmental impact**
		Soil: DEG can be persistent when released into the soil, especially under anaerobic (anoxic) conditions. It can affect soil microorganisms and can potentially damage plants if in high concentrations. The high water solubility of DEG also means that it can infiltrate into groundwater, increasing the risk of water contamination. means.

If the environmental impact caused is in compliance with the emission and immission limit values, it complies with the relevant legal requirements.

The installation of disconnection to point sources is planned as follows:

73. Table 3: Characteristic data of the disconnection equipment associated with the point sources

ID	Title	Technological process	Polluting substance	Method of separation	Separation efficiency	Emergency management
P1	Slurry production by mixing cathode powders	In connection with a cathode-side slurry powder feeding system: 1. Administration of cathode raw materials, powders 2. Cathode dust collection system dust separation	Standing powder Nickel Cobalt Manganese Aluminium Lithium Graphite PVDF	The air stream to be separated contains only dusts that must be separated before being released to the environment, no volatile substances are present in the air stream, as this point source is only used for dust injection operations and the separation technology was chosen accordingly. AIRCOMPACT 24C1200 Mechanical air filtration with filter cartridges: the airflow is extracted from the process spaces concerned by radial fans, the particles in the airflow are separated from the fluids passing through the filter media, the choice of filter media is determined on the basis of the size of the particles to be separated, so that the given to achieve separation efficiency appropriate to the technology. Filter: TFMA H13 filter bank, anti-static Teflon membrane H13 filter, H13 filter class: also called sterile filters, they are mainly used in air purifiers, hospital used in air handling systems where the aim is to produce a sterile environment. They are able to filter out bacteria and viruses. Particle size: between 0,1 and 0,001 micron Separation efficiency: 99.99 %. Deviating from the separation efficiency in the direction of safety a lower value has been taken into account.	99,90%	Differential pressure to detect clogging of the filter fabric sensors are installed give a central signal to the technology when a filter needs to be changed, or , the technology is automatically stopped if the filters do not function properly (e.g. filter fabric tears, etc.). The filters have a built-in exhaust system and a post-cleaning function. All extraction systems are redundant, so that in the event of a failure, the filter is automatically diverted to the next stage of the process. airflow to the redundant side.
P2	Slurry preparation Mixing anode powders	Related to anode-side slurry powder delivery system: 1. Administration of anode raw materials, powders 2. Anode dust collection system dust separation	Solid material Graphite Silicon Carboxymeth yl cellulose	The air stream to be separated contains only dusts that must be separated before being released to the environment, no volatile substances are present in the air stream, as this point source is only used for dust injection operations and the separation technology was chosen accordingly. AIRCOMPACT 24C1200 Mechanical air filtration with filter cartridges: the airflow is extracted from the process spaces concerned by radial fans, the particles in the airflow are separated from the fluids passing through the filter media, the choice of filter media is determined on the basis of the size of the particles to be separated, so that the given to achieve separation efficiency appropriate to the technology. Filter: TFMA H13 filter bank, anti-static Teflon membrane H13 filter, H13 filter class: also called sterile filters, they are mainly used in air purifiers, hospital used in air handling systems where the aim is to produce a sterile environment. They are able to filter out bacteria and viruses. Particle size: between 0,1 and 0,001 micron Separation efficiency: 99,99 %. For safety reasons, a lower value than this has been taken into account for the separation efficiency.	99,90%	Differential pressure to detect clogging of the filter fabric sensors are installed give a central signal to the technology when a filter needs to be changed, or , the technology is automatically stopped if the filters do not function properly (e.g. filter fabric tears, etc.). The filters have a built-in exhaust system and a post-cleaning function. All extraction systems are redundant, so that in the event of a failure, the filter is automatically diverted to the next stage of the process. airflow to the redundant side.
P3	Slurry production of cathode	Related to the production of cathode-side slurry: 1. Cathode slurry mixing tanks vacuum system and process ventilation 2. Ventilation of cathode washing room 3. Local withdrawals from Quality Control (QC) laboratories	Solid material Nickel Cobalt Manganese Aluminium Lithium Graphite PVDF NMP	The air stream to be captured particulates and volatile substances that must be separated before being released to the environment. The separation technology is therefore defined as a two-stage process, the first stage consisting of a pre-filter and bag filter combined with an H13 compact cartridge filter in the for efficient removal of particles in the air stream, and a second stage, an activated carbon tower, for the removal of volatile substances in the air stream. 1. CLEAN-ASSOCLEAN-104 pre-filter + bag filter + H13 compact cartridge filter: filter cartridge mechanical air filtration: radial from the process spaces concerned fans are used to extract the airflow, the particles the airflow are separated from the fluids passing through the filter media, the selection of the filter media is determined by the size of the particles to be separated, so that the given to achieve separation efficiency appropriate to the technology. The filtration is carried out in several stages, which are the filter types for each stage: G4 / F9 / H13	Dust: 99,9% NMP: 70%	1. Dust filtration: Differential pressure to detect clogging of the filter fabric sensors are installed give a central signal to the technology when a filter needs to be changed, or , the technology is automatically stopped if the filters do not function properly (e.g. filter fabric tears, etc.). The filters have a built-in exhaust system and a post-cleaning function. All extraction systems are redundant, so that a in the event of a malfunction

ID	Title	Technological process	Polluting substance	Method of separation	Separation efficiency	Emergency management
				Filter class G4: These filters are called coarse dust filters or prefilters. They can separate dust particles that are visible to the eye. Particle size: between 50 - 5 microns Degree of separation: 90% Filter class F9: Fine filters, these are able to separate small dust particles (only visible under a microscope) such as pollen, abrasive dust, fine metal dust. Particle size: between 5 and 0.1 micron Degree of separation: 95% Filter class H13: Also called Hepa filters, sterile filters, these are mainly used used in air purifiers and hospital air handling systems where the aim is to create a sterile environment. They are able to filter out bacteria and viruses. Particle size: between 0.1 - 0.001 micron Separation efficiency: 99.99 % 2. Activated carbon charging tower - FKUBO-6-500 The principle of capture is to adsorb harmful substances in the air stream before they are released into the environment, whereby a significant proportion of them captured. The adsorbent is selected on the basis of the harmful substances in the air stream to achieve the most efficient separation possible. The most commonly used adsorbent for organic matter sequestration is activated carbon, but the exact type of activated carbon is also specified to ensure the highest possible degree of separation. Adsorbent type: supersorbon activated carbon - a new development of high adsorption activated carbon Supersorbon is a steam-activated carbon based on coconut shell with a special pore structure and a large internal surface area. The activated carbon is dust-free and has a high hardness and high adsorption capacity. Supersorbon is produced by an acid washing process with low ash content and low to achieve iron content. This type of activated carbon can also be used to separate low boiling and flammable solvents. The CTC adsorption binder above 85 % by weight.		the airflow is automatically redirected to the redundant side. 2. Active Carbon Tower: The tower has a redundant design, so that the redundant tower can be used both in case of a change of charge and in case of a disaster. A the weight of the load is measured, allowing the saturation of the load to be monitored continuously, the saturation of the load the system will automatically switch to the redundant branch, both loaded saturation and in the event of a system fault signal, the technology automatically shut down ensure that no environmental emissions can occur due to operational errors.
P4	Slurry production anode	Related to the production of anode-side slurry: 1. Anode slurry mixing tanks vacuum system and process ventilation 2. Anode washroom ventilation 3. Local withdrawals from Quality Control (QC) laboratories	Solid material Graphite Silicon Carboxymethyl cellulose	The air stream to be captured particulates and volatile substances that must be separated before being released to the environment. The separation technology is therefore defined as a two-stage process, the first stage consisting of a pre-filter and bag filter combined with an H13 compact cartridge filter in the for efficient removal of particles in the air stream, and a second stage, an activated carbon tower, for the removal of volatile substances in the air stream. 1. CLEAN-ASSOCLEAN-84 pre-filter + bag filter + H13 compact cartridge filter: filter cartridge mechanical air filtration: radial from the process spaces concerned fans are used to extract the airflow, the particles the airflow are separated from the fluids passing through the filter media, the selection of the filter media is determined by the size of the particles to be separated, so that the given to achieve separation efficiency appropriate to the technology. The filtration is carried out in several stages, which are the filter types for each stage: G4 / F9 / H13 Filter class G4: These filters are called coarse dust filters or prefilters. They can separate dust particles that are visible to the eye. Particle size: between 50 - 5 microns Degree of separation: 90%	Dust: 99,9% Solvent: 70%	1. Dust filtration: Differential pressure to detect clogging of the filter fabric sensors are installed give a central signal to the technology when a filter needs to be changed, or , the technology is automatically stopped if the filters do not function properly (e.g. filter fabric tears, etc.). The filters have a built-in exhaust system and a post-cleaning function. All extraction systems are redundant, so that in the event of a failure, the filter is automatically diverted to the next stage of the process. airflow to the redundant side. 2. Active carbon tower: The tower has a redundant design, so that in the event of both a change of charge and a disaster

ID	Title	Technological process	Polluting substance	Method of separation	Separation efficiency	Emergency management
				Filter class F9: Fine filters, these are able to separate small dust particles (only visible under a microscope) such as pollen, abrasive dust, fine metal dust. Particle size: between 5 and 0.1 micron Degree of separation: 95% Filter class H13: Also called Hepa filters, sterile filters, these are mainly used used in air purifiers and hospital air handling systems where the aim is to create a sterile environment. They are able to filter out bacteria and viruses. Particle size: between 0.1 - 0.001 micron Separation efficiency: 99.99 % 2. Activated carbon charging tower - FKUBO-4-500 The principle of capture is to adsorb harmful substances in the air stream before they are released into the environment, whereby a significant proportion of them captured. The adsorbent is selected on the basis of the harmful substances in the air stream to achieve the most efficient separation possible. Activated carbon is the most commonly used adsorbent for organic matter sequestration, but the exact type of activated carbon is also specified to ensure the highest possible degree of separation. Adsorbent type: supersorbon activated carbon - a new development of high adsorption activated carbon Supersorbon is a steam-activated carbon based on coconut shell with a special pore structure and a large internal surface area. The activated carbon is dust-free and has a high hardness and high adsorption capacity. Supersorbon is produced by an acid washing process with low ash content and low to achieve iron content. This type of activated carbon can also be used to separate low boiling and flammable solvents. The CTC adsorption binder above 85 % by weight.		the redundant tower can be used. The weight of the charge measured, by which the the saturation of the charge can be continuously monitored, the saturation of the charge the system will automatically switch to the redundant branch, both loaded saturation and in the event of a system fault signal, the technology automatically shut down ensure that no environmental emissions can occur due to operational errors.
P5	Cathode foil coating coil winding	Cathode side winder 1. Cathode side dust extraction from winding equipment 2. Cathode side markers Abstraction	Solid material Nickel Cobalt Manganese Aluminium Lithium Graphite PVDF Diethylene glycol	The air stream to be separated mainly airborne particles, must be removed for quality assurance reasons required by the production process, mainly from the technological process during the winding process. dust formation is not . To a lesser extent, the air streams emitted by the marking equipment are directed to this point source, which contain volatile pollutants. Taking into account the qualitative and quantitative composition of the streams to be separated, a combined separation system with an activated carbon separation module a dust collection unit is installed. 1. CLEAN-CARBO-ASSOCLEAN-84 pre-filter+ bag filter+ H13 compact cartridge filter + CARBO active carbon module: mechanical air filtration with filter cartridge: the airflow is extracted from the process spaces concerned by radial fans, the particles in the airflow are separated from the fluids passing through the filter media, the filter media is selected on the basis of the size of the particles to be separated, so that the given to achieve separation efficiency appropriate to the technology. The dust filter is integrated with an activated carbon CARBO separation module. The activated carbon separator volatile compounds from the air stream passing through the module are bound on the activated carbon by adsorption. Filter cartridge G4 / F9 / H13+ Supersorbon activated carbon Filter class G4: These filters are called coarse dust filters or prefilters. They can separate dust particles that are visible to the eye. Particle size: between 50 - 5 microns	Dust: 99,9% Solvent: 70%	Differential pressure to detect clogging of the filter fabric sensors are installed give a central signal to the technology when a filter needs to be changed, or , the technology is automatically stopped if the filters do not function properly (e.g. filter fabric tears, etc.). The filters have a built-in exhaust system and a post-cleaning function. All extraction systems are redundant, so that in the event of a failure, the filter is automatically diverted to the next stage of the process. airflow to the redundant side.

ID	Title	Technological process	Polluting substance	Method of separation	Separation efficiency	Emergency management
				Degree of separation: 90% Filter class F9: Fine filters, these are able to separate small dust particles (only visible under a microscope) such as pollen, abrasive dust, fine metal dust. Particle size: between 5 and 0.1 micron Degree of separation: 95% Filter class H13: Also called Hepa filters, sterile filters, these are mainly used used in air purifiers and hospital air handling systems where the aim is to create a sterile environment. They are able to filter out bacteria and viruses. Particle size: between 0.1 - 0.001 micron Separation efficiency: 99.99 % Supersorbon activated carbon module: adsorbent type: supersorbon activated carbon - a new development of high adsorption activated carbon Supersorbon is a steam-activated carbon based on coconut shell with a special pore structure and a large internal surface area. The activated carbon is dust-free and has a high hardness and high adsorption capacity. Supersorbon is produced by an acid washing process with low ash content and low to achieve iron content. This type of activated carbon can also be used to separate low boiling and flammable solvents. The adsorption binding capacity of CTC is above 85 % by weight.		
P6	Cathode foil coating	cathode side drying oven slurry application unit local extraction	NMP	NMT-48000-FKUBO-8x2-redundáns • On the cathode side, there are 3 production lines, each line being identical in terms of technological steps, with 1 drying oven per line. The drying ovens have their own separation system and emission sources, accordingly 3 NMP separation and 3 associated emission point sources will be installed. In order to achieve a high efficiency separation of NMP, a multi-stage gas scrubbing system combined with a special activated carbon separator will be installed, consisting of the following technological steps • Passage of contaminated air through a double plate heat recovery unit after mechanical pre-filtration. Pre-cooling is provided by air exiting the ambient discharge horn after the activated carbon bed. If the ambient air is lower than the emission air temperature, direct heat exchange pre-cooling is performed with ambient air until the freezing point is reached • The contaminated precooled air on the primary side is precooled by direct cooling. Achievable efficiency in winter is about 40%. Pre-cooling is achieved via an automatically controlled damper. Operating temperature from outside air: +1 to +10°C.	80%	1. Multi-stage gas scrubbing tower, with its own damage tray, to catch contaminated wash water in the event of a malfunction. By monitoring the water quality of the washing tower, the expected efficiency can be ensured at all times. A fault report collected from the washing towers is output to the BMS system, which the technology is automatically stopped. The entire system is automatically operated, so risks from human error are eliminated. 2. Active carbon tower: The tower has a redundant design, so that in the event of both a change of charge and a disaster

ID	Title	Technological process	Polluting substance	Method of separation	Separation efficiency	Emergency management
P7	Cathode foil coating	cathode side drying oven slurry application unit local extraction	NMP	Beyond these ambient temperatures, pre-cooling is done with purified cold air. • The contaminated air is passed through the cold water cooling coil 1, into which cold water is circulated from the phase 2 tower, further pre-cooling the contaminated air • The polluted air is introduced into the first phase tower. Here, a countercurrent aqueous contact scrubbing is performed, absorbing the solvents in the polluted air. After the first phase, the cleaning rate is 40-55%. • the air from phase 1 is passed through the cold water cooling coil 2, which cools the air pre-cleaned in phase 1 to 8-12 °C. • The cooled air is introduced into the phase 2 absorber tower, where the residual pollutant is also removed from the air by countercurrent contact washing. As a result of the cold air and the countercurrent water scrubbing, the gas scrubber water will cool down to a temperature of 10-14 °C, ensuring maximum absorption efficiency. • The gas scrubber water is kept below 10 °C by forced cooling • After the phase 2 scrubbing, the air is passed through a phase 3 cold water condenser unit and an activated carbon afterfilter, and after the double plate heat recovery pre-cooler unit, it is discharged to the open air with an emission below the limit value (below 1 $mg/m^{3)}$ • The wash water of a phase 2 cold water system is less contaminated and therefore suitable for pre-cooling the air in the first phase by feeding it into the pre-cooling calorifier before phase 1. • The system is equipped with a real-time emission measurement system to ensure continuous NMP emissions below 1 mg/m^3. • The resulting waste water is discharged into the contaminated NMP tanks • In the final stage, the air stream is directed to redundant activated carbon towers, the principle of which is to adsorb pollutants in the air stream before they are released to the environment, thereby capturing a significant proportion of them. The adsorbents are selected on the basis of the pollutants in the air stream to achieve the most efficient separation possible. The most commonly used adsorbent for organic matter sequestration is activated carbon, but the exact type of activated carbon is specified to ensure the highest possible degree of separation. Adsorbent type: supersorbon activated carbon - a newly developed high adsorption activated carbon.	80%	the redundant tower can be used. The weight of the charge measured, by which the the saturation of the charge can be continuously monitored, the saturation of the charge the system will automatically switch to the redundant branch, both loaded saturation and in the event of a system fault signal, the technology automatically shut down ensure that no environmental emissions can occur due to operational errors.
P8	Cathode foil coating	cathode side drying furnace slurry application unit local extraction	NMP		80%	
P9	Anode foil coating, winding	Anode side winding 1. Anode side dust extraction from winding equipment 2. Anode side extraction of marking equipment	Solid material Graphite Silicon Carboxymethyl cellulose Diethylene glycol	The air stream to be separated mainly airborne particles, must be removed for quality assurance reasons required by the production process, mainly from the technological process during the winding process. dust formation is not . To a lesser extent, air streams emitted by marking equipment are directed to this point source, which emit volatile pollutants contain. Taking into account the qualitative and quantitative composition of the currents to be decoupled, a combined decoupling module with an activated carbon a dust collection unit is installed.	Dust: 99,9% Solvent: 70%	Differential pressure to detect clogging of the filter fabric sensors are installed give a central signal to the technology when a filter needs to be changed, or , the technology to stop automatically if the operation of the filters

ID	Title	Technological process	Polluting substance	Method of separation	Separation efficiency	Emergency management
				1. CLEAN-CARBO-ASSOCLEAN-84 pre-filter+ bag filter+ H13 compact cartridge filter + CARBO active carbon module: mechanical air filtration with filter cartridge: the airflow is extracted from the process spaces concerned by radial fans, the particles in the airflow are separated from the fluids passing through the filter media, the filter media is selected on the basis of the size of the particles to be separated, so that the given to achieve separation efficiency appropriate to the technology. The dust filter is integrated with an activated carbon CARBO separation module. The activated carbon separator volatile compounds from the air stream passing through the module are bound on the activated carbon by adsorption. Filter cartridge G4 / F9 / H13+ Supersorbon activated carbon Filter class G4: These filters are called coarse dust filters or prefilters. They can separate dust particles that are visible to the eye. Particle size: between 50 - 5 microns Degree of separation: 90% Filter class F9: Fine filters, these are able to separate small dust particles (only visible under a microscope) such as pollen, abrasive dust, fine metal dust. Particle size: between 5 and 0.1 micron Degree of separation: 95% Filter class H13: Also called Hepa filters, sterile filters, these are mainly used used in air purifiers and hospital air handling systems where the aim is to create a sterile environment. They are able to filter out bacteria and viruses. Particle size: between 0.1 and 0.001 micron Separation efficiency: 99.99 % Supersorbon activated carbon module: adsorbent type: supersorbon activated carbon - a new development of high adsorption activated carbon Supersorbon is a steam-activated carbon based on coconut shell with a special pore structure and a large internal surface area. The activated carbon is dust-free and has a high hardness and high adsorption capacity. Supersorbon is produced by an acid washing process with low ash content and low to achieve iron content. This type of activated carbon can also be used to separate low boiling and flammable solvents. The adsorption binding capacity of CTC is above 85 % by weight.		inappropriate (e.g. filter fabric tear, etc.). The filters have a built-in draining system and a post-cleaning function. All suctions are redundantly designed so that in the event of a failure, they are automatically rerouted to the airflow to the redundant side.
P10	Anode foil coating 1	anode side drying furnace slurry application unit local extraction	Solid material Graphite Silicon Carboxymethyl cellulose PAA	TANDEM-CLEAN-ASSOCLEAN-104 / FKUBO-8-500 On the anode side, there are 3 production lines, each line identical in terms of technological steps, with 1-1 per line accordingly. drying kilns will be installed. The drying ovens will their own separation system and emission sources, and accordingly 3 anode-side separators and 3 associated emission point sources will be installed. Water will be used as a solvent on the anode side, from which no emissions are expected in principle, but which may carry away dusts in the slurry with the evaporating water, or PAA evaporates slightly at the drying temperature, these conditions a two-stage separation technology was established, the first stage of which is a mechanical separation system with filter cartridges combined with a pre-filter and bag filter. air filtration, and a second stage with an active-coal separation tower in tandem.	Dust: 99,9% Solvent: 70%	1. Dust filtration: Differential pressure to detect clogging of the filter fabric sensors are installed give a central signal to the technology when a filter needs to be changed, or , the technology is automatically stopped if the filters are not working properly (e.g. filter fabric tears, etc.).
P11	Anode foil coating 2	anode side drying furnace slurry application unit local extraction	Solid material Graphite Silicon Carboxymethyl cellulose PAA		Dust: 99,9% Solvent: 70%	

ID	Title	Technological process	Polluting substance	Method of separation	Separation efficiency	Emergency management
P12	Anode foil coating 3	anode side drying furnace slurry application unit local extraction	Solid material Graphite Silicon Carboxymeth yl cellulose PAA	1. CLEAN-ASSOCLEAN-104 mechanical air filtration with filter cartridges: the airflow is extracted from the process spaces concerned by radial fans, the particles in the airflow are separated from the fluids passing through the filter media, the choice of filter media is determined on the basis of the size of the particles to be separated, so that the given to achieve separation efficiency appropriate to the technology. The filtration is carried out in several stages, which are the filter types for each stage: G4 / F9 / H13 Filter class G4: These filters are called coarse dust filters or prefilters. They can separate dust particles that are visible to the eye. Particle size: between 50 - 5 microns Degree of separation: 90% Filter class F9: Fine filters, these are able to separate small dust particles (only visible under a microscope) such as pollen, abrasive dust, fine metal dust. Particle size: between 5 and 0.1 micron Degree of separation: 95% Filter class H13: Also called Hepa filters, sterile filters, these are mainly used used in air purifiers and hospital air handling systems where the aim is to create a sterile environment. They are able to filter out bacteria and viruses. Particle size: between 0.1 - 0.001 micron Separation efficiency: 99.99 % 2. Activated carbon charging tower - FKUBO-8-500 The principle of capture is to adsorb harmful substances in the air stream before they are released into the environment, whereby a significant proportion of them captured. The adsorbent is selected on the basis of the pollutants in the air stream to achieve the most efficient separation possible. The most commonly used adsorbent for organic matter sequestration is activated carbon, but the exact type of activated carbon is also specified to ensure the highest possible degree of separation. Adsorbent type: supersorbon activated carbon - a new development of high adsorption activated carbon Supersorbon is a steam-activated carbon based on coconut shell with a special pore structure and a large internal surface area. The activated carbon is dust-free and has a high hardness and high adsorption capacity. Supersorbon is produced by an acid washing process with low ash content and low to achieve iron content. This type of activated carbon can also be used to separate low boiling and flammable solvents. The adsorption binding capacity of CTC is above 85 % by weight. Tandem design: modular filter towers connected in parallel, according to the carbon mass or airflow demand. The Tandem design allows allows the use of smaller physical modules and lower critical carbon mass.	Dust: 99,9% Solvent: 70%	have a function. All extraction units are redundant, so in the event of a failure, they are automatically redirected to the airflow to the redundant side. 2. Active Carbon Tower: The tower has a redundant design, so that the redundant tower can be used both in case of a change of charge and in case of a disaster. A the weight of the load is measured, allowing the saturation of the load to be monitored continuously, the saturation of the load the system will automatically switch to the redundant branch, both loaded saturation and in the event of a system fault signal, the technology automatically shut down ensure that no environmental emissions can occur due to operational errors.
P13	Laser cutting and winding 1	Cathode page: laser cutting equipment extraction	Aluminium	Laser cutting is used in the cutting and winding processes of the assembly operation, and the fumes, dusts and fumes generated during laser cutting are common are discharged to the environment via a collecting duct, where the pollutants in the air stream are separated before discharge. The separation technology is	99,90%	Differential pressure to detect clogging of the filter fabric sensors are installed give a central signal to the technology when a filter needs to be changed, or

ID	Title	Technological process	Polluting substance	Method of separation	Separation efficiency	Emergency management
P14	Laser cutting and winding 2			has been selected according to good practice in industrial laser cutting/welding. IPERJET DF-MAX-TRU-24C120 compact filter cartridge indoor mechanical air filtration: the technology concerned air is extracted from the spaces by radial fans, particles in the air stream are separated from the fluids passing through the filter media, the filter media is selected on the basis of the size of the particles to be separated, in order to achieve an efficient separation for the technology. The filtration is carried out with TFMA H13 filters, which are also suitable for the separation of pollutants from welding fumes. The TFMA H13 filter bank, antistatic Teflon membrane H13 filter, H13 filter class: also called sterile filters, these are mainly used in air purifiers and hospital air handling systems where the aim is to create a sterile environment. They are able to filter out bacteria and viruses. Particle size: between 0.1 and 0.001 micron Separation efficiency: 99,99 %. For safety reasons, a lower value than this has been taken into account for the separation efficiency.		, the technology is automatically stopped if the filters do not function properly (e.g. filter fabric tears, etc.). The filters have a built-in exhaust system and a post-cleaning function. All extraction systems are redundant, so that in the event of a failure, the filter is automatically diverted to the next stage of the process. airflow to the redundant side.
P15	Laser cutting and winding 3					
P16	Laser cutting and winding 4					
P17	Laser cutting and winding 5	Anode page: laser cutting equipment extraction	Copper	Laser cutting is used in the cutting and winding processes of the assembly operation, and the fumes, dusts and fumes generated during laser cutting are common are discharged to the environment via a collecting duct, where the pollutants in the air stream are separated before discharge. The separation technology is based on good practice in industrial laser cutting/welding for selection. IPERJET DF-MAX-TRU-24C1200 compact filter cartridge indoor mechanical air filtration: the technology concerned air is extracted from the spaces by radial fans, particles in the air stream are separated from the fluids passing through the filter media, the filter media is selected on the basis of the size of the particles to be separated, in order to achieve an efficient separation for the technology. The filtration is carried out with TFMA H13 filters, which are also suitable for the separation of pollutants from welding fumes. The TFMA H13 filter bank, antistatic Teflon membrane H13 filter, H13 filter class: also called sterile filters, these are mainly used in air purifiers and hospital air handling systems where the aim is to create a sterile environment. They are able to filter out bacteria and viruses. Particle size: between 0.1 and 0.001 micron Separation efficiency: 99,99 %. For safety reasons, a lower value than this has been taken into account for the separation efficiency.	99,90%	Differential pressure to detect clogging of the filter fabric sensors are installed give a central signal to the technology when a filter needs to be changed, or , the technology is automatically stopped if the filters do not function properly (e.g. filter fabric tears, etc.). The filters have a built-in exhaust system and a post-cleaning function. All extraction systems are redundant, so that in the event of a failure, the filter is automatically diverted to the next stage of the process. airflow to the redundant side.
P18	Laser cutting and winding 6					
P19	Laser cutting and winding 7	Anode page: laser cutting equipment extraction	Copper	Laser cutting is used in the cutting and winding processes of the assembly operation, and the fumes, dusts and fumes generated during laser cutting are common are discharged to the environment via a collecting duct, where the pollutants in the air stream are separated before discharge. The separation technology is based on good practice in industrial laser cutting/welding for selection. IPERJET DF-MAX-TRU-12C1200 compact filter cartridge indoor mechanical air filtration: the technology concerned air is extracted from the spaces by radial fans, particles in the air stream are separated from the fluids passing through the filter media, the filter media is selected on the basis of the size of the particles to be separated, in order to achieve an efficient separation for the technology. The filtration is carried out with TFMA H13 filters, which are also suitable for the separation of pollutants from welding fumes. The TFMA H13 filter bank, antistatic Teflon membrane H13 filter, H13 filter class: also called sterile filters, these are mainly	99,90%	Differential pressure to detect clogging of the filter fabric sensors are installed give a central signal to the technology when a filter needs to be changed, or , the technology is automatically shut down if the filters do not function properly (e.g. filter fabric tears, etc.). The filters have a built-in exhaust system and a post-cleaning function. All extraction systems are redundant, so that in the event of a failure, the filter is automatically diverted to the next stage of the process. airflow to the redundant side.
P20	Laser cutting and winding 8					

ID	Title	Technological process	Pollutant-substance	Method of separation	Separation efficiency	Emergency management
				used in air purifiers and hospital air handling systems where the aim is to create a sterile environment. They are able to filter out bacteria and viruses. Particle size: between 0.1 and 0.001 micron Separation efficiency: 99.99 %. For safety reasons, a lower value than this has been taken into account for the separation efficiency.		
P21	Engraver	marking, engraving	NMHC	During the assembly operations, the reels are marked, the exhaust system of the marking equipment is fed through a common manifold is discharged to the environment, where the pollutants in the air stream are separated before discharge. Separation takes place on dust collectors with compact activated carbon modules. CLEAN-CARBO-ASSOCLEAN-64: pre-filter+ bag filter+ H13 compact cartridge filter + CARBO active carbon module: mechanical air filtration with filter cartridge: the airflow is extracted from the process spaces concerned by radial fans, the particles in the airflow are separated from the fluids passing through the filter media, the filter media is selected on the basis of the size of the particles to be separated, so that the given to achieve separation efficiency appropriate to the technology. The dust filter is integrated with an activated carbon CARBO separation module. The activated carbon separator volatile compounds from the air stream passing through the module are bound on the activated carbon by adsorption. Filter cartridge G4 / F9 / H13+ Supersorbon activated carbon Filter class G4: These filters are called coarse dust filters or prefilters. They can separate dust particles that are visible to the eye. Particle size: between 50 - 5 microns Degree of separation: 90% Filter class F9: Fine filters, these are able to separate small dust particles (only visible under a microscope) such as pollen, abrasive dust, fine metal dust. Particle size: between 5 and 0.1 micron Degree of separation: 95% Filter class H13: Also called Hepa filters, sterile filters, these are mainly used used in air purifiers and hospital air handling systems where the aim is to create a sterile environment. They are able to filter out bacteria and viruses. Particle size: between 0.1 and 0.001 micron Separation efficiency: 99.99 % Supersorbon activated carbon module: adsorbent type: supersorbon activated carbon - a new development of high adsorption activated carbon Supersorbon is a steam-activated carbon based on coconut shell with a special pore structure and a large internal surface area. The activated carbon is dust-free and has a high hardness and high adsorption capacity. Supersorbon is produced by an acid washing process with low ash content and low to achieve iron content. This type of activated carbon can also be used to separate low boiling and flammable solvents. The adsorption binding capacity of CTC is above 85 % by weight.	Dust: 99,9% Solvent: 70%	Differential pressure to detect clogging of the filter fabric sensors are installed give a central signal to the technology when a filter needs to be changed, or , the technology is automatically shut down if the filters do not function properly (e.g. filter fabric tears, etc.). The filters have a built-in exhaust system and a post-cleaning function. All extraction systems are redundant, so that in the event of a failure, the filter is automatically diverted to the next stage of the process. airflow to the redundant side.
P22	Assembly line 1	extraction of welding processes	Solid material Aluminium Copper Iron	The fumes generated during the welding processes associated with the assembly operation are routed through a common manifold (3 separate backbone ducts) discharged to the environment, which, before being discharged, removes pollutants in the air stream	99,90%	Differential pressure to detect clogging of the filter fabric sensors are installed, which provide a central signal for the technology

ID	Title	Technological process	Pollutant-substance	Method of separation	Separation efficiency	Emergency management
P23	Assembly line 2		Manganese Nickel	are disconnected. The deposition technology has been selected according to good practice in industrial laser cutting/welding. IPERJET DF-MAX-TRU -24C1200 x TANDEM: compact filter cartridge indoor mechanical air filtration: the technology concerned the air is extracted from the spaces by radial fans, the particles in the air stream are separated from the fluids passing through the filter media, the filter media is selected on the basis of the size of the particles to be separated, in order to achieve an efficient separation for the technology. The filtration is carried out with TFMA H13 filters, which are also suitable for the separation of pollutants from welding fumes. The TFMA H13 filter bank, antistatic Teflon membrane H13 filter, H13 filter class: also called sterile filters, these are mainly used in air purifiers and hospital air handling systems where the aim is to create a sterile environment. They are able to filter out bacteria and viruses. Particle size: between 0.1 and 0.001 micron Separation efficiency: 99,99 %. For safety reasons, a lower value than this has been taken into account for the separation efficiency. Tandem design: modular filter towers connected in parallel to optimise individual flow rates and carbon use.		about the need for filter replacement or malfunction, the technology is automatically stopped if the filters do not function properly (e.g. filter fabric tears, etc.). The filters have a built-in exhaust system and a post-cleaning function. All extraction systems are redundant, so that in the event of a failure, the filter is automatically diverted to the next stage of the process. airflow to the redundant side.
P24	Assembly line 3					
P25	Vacuum drying	Related to vacuum drying processes: vacuum system exhausts dust removal dryer exhausts	Solid material Aluminium Copper	During the assembly operations, before electrolyte filling, the assembled coils are vacuum dried to ensure that any moisture that may have been trapped during assembly is completely removed, thus ensuring the quality of the finished batteries. During vacuum drying, water evaporation is generally expected, but any water that may be present in the coils the separation technology is also prepared for residual NMP and dusts in a way that has been selected to ensure adequate separation efficiency in presence of these substances. The exhausts of vacuum dryers are common are discharged to the environment via a collecting duct, where the pollutants in the air stream are separated before discharge. Separation is compact on dust collectors with an activated carbon module. CLEAN-CARBO-ASSOCLEAN-104 HT: pre-filter+ bag filter+ H13 compact cartridge filter + CARBO active carbon module: mechanical air filtration with filter cartridge: the airflow is extracted from the process spaces concerned by radial fans, the particles in the airflow are separated from the fluids passing through the filter media, the filter media is selected on the basis of the size of the particles to be separated, so that the given to achieve separation efficiency appropriate to the technology. The dust filter is integrated with an activated carbon CARBO separation module. The activated carbon separator volatile compounds from the air stream passing through the module are bound on the activated carbon by adsorption. The HT type symbol is a type symbol developed for higher temperature applications, taking into account the drying temperature. Filter cartridge G4 / F9 / H13 HEPA HT+ Supersorbon activated carbon Filter class G4: These filters are called coarse dust filters or prefilters. They can separate dust particles that are visible to the eye. Particle size: between 50 - 5 microns Degree of separation: 90% Filter class F9: Fine filters, these are able to separate small dust particles (only visible under a microscope) such as pollen, abrasive dust, fine metal dust. Particle size: between 5 and 0.1 micron Degree of separation: 95%	Dust: 99,9% Solvent: 70% NMP: 70%	Differential pressure to detect clogging of the filter fabric sensors are installed give a central signal to the technology when a filter needs to be changed, or , the technology is automatically shut down if the filters do not function properly (e.g. filter fabric tears, etc.). The filters have a built-in exhaust system and a post-cleaning function. All extraction systems are redundant, so that in the event of a failure, the filter is automatically diverted to the next stage of the process. airflow to the redundant side.

ID	Title	Technological process	Polluting substance	Method of separation	Separation efficiency	Emergency management
				Filter class H13: Also called Hepa filters, sterile filters, these are mainly used used in air purifiers and hospital air handling systems where the aim is to create a sterile environment. They are able to filter out bacteria and viruses. Particle size: between 0.1 and 0.001 micron Separation efficiency: 99.99 % HT: high temperature design Supersorbon activated carbon module: adsorbent type: supersorbon activated carbon - a new development of high adsorption activated carbon Supersorbon is a steam-activated carbon based on coconut shell with a special pore structure and a large internal surface area. The activated carbon is dust-free and has a high hardness and high adsorption capacity. Supersorbon is produced by an acid washing process with low ash content and low to achieve iron content. This type of activated carbon can also be used to separate low boiling and flammable solvents. The adsorption binding capacity of CTC is above 85 % by weight.		
P26	Assembly 4	assembly welding vacuum extraction systems marking equipment extraction	Solid material Aluminium Copper Diethylene glycol	During assembly, a vacuum system will be installed in several places, with the exhausts being connected to a common manifold. In order to ensure a stable extraction volume flow, part of the welding extraction of the assembly line and the extraction of the marking equipment are also routed to this manifold and then, after passing through the separation technology described below, released to the environment at a common point source after the pollutants in the air stream have been separated. The air stream to be captured particulates and volatile substances that must be separated before being released to the environment. The separation technology is therefore defined as a two-step process, the first of which The first stage is a pre-filter and bag filter combined with an H13 compact cartridge filter for efficient removal of dust in the air stream, and the second stage is an activated carbon packed tower for the removal of volatile substances in the air stream. IPERJET DF-MAX-TRU-24C1200 compact filter cartridge indoor mechanical air filtration: the technology concerned air is extracted from the spaces by radial fans, particles in the air stream are separated from the fluids passing through the filter media, the filter media is selected on the basis of the size of the particles to be separated, in order to achieve an efficient separation for the technology. The filtration is carried out with TFMA H13 filters, which are also suitable for the separation of pollutants from welding fumes. The TFMA H13 filter bank, antistatic Teflon membrane H13 filter, H13 filter class: also called sterile filters, these are mainly used in air purifiers and hospital air handling systems where the aim is to create a sterile environment. They are able to filter out bacteria and viruses. Particle size: between 0.1 and 0.001 micron Separation efficiency: 99.99 %. For safety reasons, a lower value than this has been taken into account for the separation efficiency.	Dust: 99,9%	Differential pressure to detect clogging of the filter fabric sensors are installed give a central signal to the technology when a filter needs to be changed, or , the technology is automatically shut down if the filters do not function properly (e.g. filter fabric tears, etc.). The filters have a built-in exhaust system and a post-cleaning function. All extraction systems are redundant, so that in the event of a failure, the filter is automatically diverted to the next stage of the process. airflow to the redundant side.
P27	Injection 1	electrolyte injection equipment exhausts Injection Vacuum system Extraction	Solid material LiPF6 Dimethyl carbonate Ethylene carbonate Ethyl methyl	The electrolyte injection outlets are routed to a common manifold (3 backbone lines), the injection consists of three production lines, identical in all processes, with 1 to 1 discharge point per line. The exhaust air stream contains electrolyte, which, as an organic material, is most efficiently bound on activated carbon, redundant activated carbon towers are installed in front of the emission points.	Dust: 99,9% Electrolyte: 80%	The tower has a redundant design, so that the redundant tower can be used both in case of a change of charge and in case of a disaster. A the weight of the load is measured, allowing the saturation of the load to be monitored continuously, the saturation of the load

			carbonate			the system automatically switches to
ID	**Title**	**Technological process**	**Polluting substance**	**Method of separation**	**Separation efficiency**	**Emergency management**
			Vinyl carbonate Hydrogen fluoride	Activated carbon charging tower - FKUBO-8x2 redundant The principle of capture is to adsorb the pollutants in the air stream exhausted from the technology area by fans before they are released into the environment, thereby capturing a significant proportion of them. The choice of the adsorbent is based on harmful substances in the air stream to ensure the best possible most efficient separation. When sequestering organic matter, the the most commonly used adsorbent is activated carbon, but the exact type of activated carbon is also specified to ensure the highest possible detachment. Adsorbent type: supersorbon activated carbon - a new development of high adsorption activated carbon Supersorbon is a steam-activated carbon based on coconut shell with a special pore structure and a large internal surface area. The activated carbon is dust-free and has a high hardness and high adsorption capacity. Supersorbon is produced by an acid washing process with low ash content and low to achieve iron content. This type of activated carbon can also be used to separate low boiling and flammable solvents. The adsorption binding capacity of CTC is above 85 % by weight.		to the redundant branch, both are filled to saturation and the system automatically down if a fault is detectedensuring that no environmental emissions can occur due to operational errors.
P28	Injection 2		Solid material $LiPF_6$ Dimethyl carbonate Ethylene carbonate Ethyl methyl carbonate Vinyl carbonate Hydrogen fluoride		Dust: 99,9% Electrolyte: 80%	
P29	Injection 3		Solid material $LiPF_6$ Dimethyl carbonate Ethylene carbonate Ethyl methyl carbonate Vinyl carbonate Hydrogen fluoride		Dust: 99,9% Electrolyte: 80%	
P30	Closure welding 1		Solid material Iron Manganese Nickel	The batteries are sealed by welding, and the waste from this welding process is collected in a common collecting duct, then separated and finally, after separation of the harmful substances, discharged into the environment. Separation is carried out by means of a dust collector specially designed to treat welding fumes. The air stream to be captured particulates and volatile substances that must be separated before being released to the environment. The separation technology is therefore defined as a two-stage process, the first stage consisting of a pre-filter and bag filter combined with an H13 compact cartridge filter in the for efficient removal of particles in the air stream, and a second stage, an activated carbon tower, for the removal of volatile substances in the air stream. IPERJET DF-MAX-TRU-12C1200	99,90%	Differential pressure to detect clogging of the filter fabric sensors are installed give a central signal to the technology when a filter needs to be changed, or , the technology is automatically shut down if the filters do not function properly
P31	Closure welding 2	fume extraction from	Solid material Iron Manganese Nickel		99,90%	

P32	Closure welding 3	welding processes	Solid material Iron Manganese Nickel	compact filter cartridge indoor mechanical air filtration: the technology concerned the air is extracted from the spaces by radial fans, the particles in the air stream are separated from the fluids passing through the filter media, the filter media is selected on the basis of the size of the particles to be separated, in order to achieve an efficient separation for the technology. The filtration is carried out with TFMA H13 filters, which are also suitable for the separation of pollutants from welding fumes. The TFMA H13 filter bank, antistatic Teflon membrane H13 filter, H13 filter class: also called sterile filters, these are mainly used in air purifiers and hospital air handling systems where the aim is to create a sterile environment. They are able to filter out bacteria and viruses. Particle size: between 0.1 and 0.001 micron Separation efficiency: 99,99 %. Deviating from the separation efficiency in the direction of safety a lower value has been taken into account.	99,90%	(e.g. filter fabric tears, etc.). The filters have a built-in exhaust system and a post-cleaning function. All extraction systems are redundant, so that in the event of a failure, the filter is automatically diverted to the next stage of the process. airflow to the redundant side.
ID	**Title**	**Technological process**	**Polluting substance**	**Method of separation**	**Separation efficiency**	**Emergency management**
P33	Formatting 1			The pollutant extraction points in the shaping building are separated and discharged in a common extraction backbone network on a row-by-row basis (3 rows - 3 emission points). The air stream to be extracted contains electrolyte vapour, volatile substances from marking, dust contamination. Taking into account the qualitative and quantitative composition of the streams to be separated, one activated carbon separation module per line dust collector has been designed in front of the emission point source. 1. CLEAN-CARBO-ASSOCLEAN-104 HT bag pre-filter + H13 compact cartridge filter + activated carbon CARBO module: mechanical air filtration with filter cartridges: the airflow is extracted from the process spaces concerned by radial fans, the particles in the airflow are separated from the fluids passing through the filter media, the choice of filter media is	Dust: 99,9% Electrolyte: 80%	
P34	Formatting 2				Dust: 99,9% Electrolyte: 80%	

P35	Formatting 3	technological removals for precharging and ageing cell cleaning technological extraction marking equipment extraction tightness control process extraction testing process extraction	Solid material Iron Mangane se Nickel Dimethyl carbonat e Ethylene carbonate Ethyl methyl carbonate Vinyl carbonate LiPF6 Diethylene glycol Hydrogen fluoride	determined on the basis of the size of the particles to be separated, so that the given to achieve separation efficiency appropriate to the technology. The dust filter is integrated with an activated carbon CARBO separation module. The activated carbon separator volatile compounds from the air stream passing through the module are bound on the activated carbon by adsorption. The HT type symbol is a type symbol developed for higher temperature applications, taking into account the drying temperature. Filter cartridge G4 / F9 / H13+ Supersorbon activated carbon Filter class G4: These filters are called coarse dust filters or prefilters. They can separate dust particles that are visible to the eye. Particle size: between 50 - 5 microns Degree of separation: 90% Filter class F9: Fine filters, these are able to separate small dust particles (only visible under a microscope) such as pollen, abrasive dust, fine metal dust. Particle size: between 5 and 0.1 micron Degree of separation: 95% Filter class H13: Also called Hepa filters, sterile filters, these are mainly used used in air purifiers and hospital air handling systems where the aim is to create a sterile environment. They are able to filter out bacteria and viruses. Particle size: between 0.1 and 0.001 micron Separation efficiency: 99.99 % HT: high temperature design Supersorbon activated carbon module: adsorbent type: supersorbon activated carbon - a new development of high adsorption activated carbon Supersorbon is a steam-activated carbon based on coconut shell with a special pore structure and a large internal surface area. The activated carbon is dust-free and has a high hardness and high adsorption capacity. Supersorbon is produced by an acid washing process with low ash content and low to achieve iron content. This type of activated carbon can also be used to separate low boiling and flammable solvents. The adsorption binding capacity of CTC is above 85 % by weight.	Dust: 99,9% Electrolyte: 80%	Differential pressure to detect clogging of the filter fabric sensors are installed give a central signal to the technology when a filter needs to be changed, or , the technology is automatically shut down if the filters do not function properly (e.g. filter fabric tears, etc.). The filters have a built-in exhaust system and a post-cleaning function. All extraction systems are redundant, so that in the event of a failure, the filter is automatically diverted to the next stage of the process. airflow to the redundant side.
P36	Packaging	marking equipment technological extraction	Diethylene glycol	During the packaging process, products marked, and process exhaust from the marking equipment is collected in our common collection duct and released into the environment after the pollutants in the air stream are separated. A a dust collector with an activated carbon separation module has been planned in front of the emission point source for the separation of hazardous substances generated during the marking processes.	Dust: 99,9% Solvent: 80%	Differential pressure to detect clogging of the filter fabric sensors are installed give a central signal to the technology when a filter needs to be changed, or , the
ID	**Title**	**Technological process**	**Pollutant-substance**	**Method of separation**	**Separation efficiency**	**Emergency management**

				1. CLEAN-CARBO-ASSOCLEAN-42 bag pre-filter + H13 compact cartridge filter + CARBO active carbon module: mechanical air filtration with filter cartridges: the airflow is extracted from the process spaces concerned by radial fans, the particles in the airflow are separated from the fluids passing through the filter media, the choice of filter media is determined on the basis of the size of the particles to be separated, so that the given to achieve separation efficiency appropriate to the technology. The dust filter is integrated with an activated carbon CARBO separation module. The activated carbon separator volatile compounds from the air stream passing through the module are bound on the activated carbon by adsorption. Filter cartridge G4 / F9 / H13+ Supersorbon activated carbon Filter class G4: These filters are called coarse dust filters or prefilters. They can separate dust particles that are visible to the eye. Particle size: between 50 - 5 microns Degree of separation: 90% Filter class F9: Fine filters, these are able to separate small dust particles (only visible under a microscope) such as pollen, abrasive dust, fine metal dust. Particle size: between 5 and 0.1 micron Degree of separation: 95% Filter class H13: Also called Hepa filters, sterile filters, these are mainly used used in air purifiers and hospital air handling systems where the aim is to create a sterile environment. They are able to filter out bacteria and viruses. Particle size: between 0.1 and 0.001 micron Separation efficiency: 99.99 % Supersorbon activated carbon module: adsorbent type: supersorbon activated carbon - a new development of high adsorption activated carbon Supersorbon is a steam-activated carbon based on coconut shell with a special pore structure and a large internal surface area. The activated carbon is dust-free and has a high hardness and high adsorption capacity. Supersorbon is produced by an acid washing process with low ash content and low to achieve iron content. This type of activated carbon can also be used to separate low boiling and flammable solvents. The adsorption binding capacity of CTC is above 85 % by weight.		technology is automatically shut down if the filters do not function properly (e.g. filter fabric tears, etc.). The filters have a built-in exhaust system and a post-cleaning function. All extraction systems are redundant, so that in the event of a failure, the filter is automatically diverted to the next stage of the process. airflow to the redundant side.
P37	Electrolyte tank farm		Dimethyl carbonate Ethylene carbonate Ethyl methyl carbonate Vinyl carbonate LiPF6	The electrolyte injections are directed to a common manifold line, the injection consists of three identical production lines in each process, with 1-1 emission point will be established. The extracted air stream contains electrolyte, which as an organic material is most efficiently bound on activated carbon and redundant activated carbon towers are installed in front of the emission points. Activated carbon charging tower - FKUBO-8x2 redundant The principle of capture is to adsorb the pollutants in the air stream exhausted from the technology area by fans before they are released into the environment, thereby capturing a significant proportion of them. The choice of the adsorbent is based on harmful substances the air stream to achieve the most efficient separation possible. When sequestering organic substances, the most common The adsorbent used is activated carbon, but the exact type of activated carbon is also specified to ensure the highest possible degree of separation.	80%	The tower has a redundant design, so that the redundant tower can be used both in case of a change of charge and in case of a disaster. A the weight of the load is measured, allowing the saturation of the load to be monitored continuously, the saturation of the load the system will automatically switch to the redundant branch, both loaded saturation and in the event of a system fault signal, the technology automatically shut down ensure that no environmental emissions can occur due to operational errors.

ID	Title	Technological process	Pollutant-substance	Method of separation	Separation efficiency	Emergency management
				Adsorbent type: supersorbon activated carbon - a new development of high adsorption activated carbon Supersorbon is a steam-activated carbon based on coconut shell with a special pore structure and a large internal surface area. The activated carbon is dust-free and has a high hardness and high adsorption capacity. Supersorbon is produced by an acid washing process with low ash content and low to achieve iron content. This type of activated carbon can also be used to separate low boiling and flammable solvents. The adsorption binding capacity of CTC is above 85 % by weight.		
P38	NMP tank farm	NMP tanks technology breathing lines NMP storage tank room normal and emergency extraction	NMP Solids Hydrogen chloride Hydrogen fluoride	The NMP storage tanks in the NMP tank farm and in the EL building are equipped with ventilation ducts for the safe operation of the process, which respiratory lines are collected in a common manifold and separated before release into the environment. Normal and emergency exhausts from the NMP storage rooms will be routed to the same separator to ensure that no contaminated air is released to the environment in the event of an accident or spill. The principle of separation is that NMP is highly soluble in water, but in order to apply the best technical solution, a activated carbon post-filtration will also be incorporated to minimise environmental load from NMP. The technological steps of the separation process: NMT-15000, 2 phase gas scrubber with active cooling: 1. The polluted air is introduced into the first phase tower. Here a countercurrent water contact scrubbing takes place, the solvents in the contaminated air absorbed. The purification rate after the first phase is 40-55%. The polluted air stream is then further cooled, increasing the efficiency of the absorption. The cooled contaminated air is introduced into the second phase absorber tower, where the residual pollutant is also removed from the air by countercurrent contact scrubbing. As a result of the cold air and the countercurrent water scrubbing, the gas scrubber water will cool down to a temperature of 10-14 °C, ensuring maximum absorption efficiency. The resulting effluent will be treated with contaminated NMP is discharged into tanks 2. 2-stage condenser: after the 2nd stage gas scrubbing, the air is passed through a a two-stage cold water condenser unit to prepare the airflow for delivery to the activated carbon tower, in order to the most effective separation can be achieved 3. Activated carbon tower with aftercooling: in the final stage, the airflow is directed to redundant activated carbon towers, the principle of which is to adsorb the pollutants in the airflow before they are released to the environment, thereby capturing a significant proportion of them. Selection of the adsorbent in the air stream of harmful substances in the water to the most effective separation possible. The most commonly used organic substances for sequestration are The adsorbent used is activated carbon, but the exact type of activated carbon is also specified to ensure the highest possible degree of separation. Adsorbent type: supersorbon activated carbon - a new development of high adsorption activated carbon.	90%	1. Multi-stage gas scrubbing tower, with its own damage tray, to catch contaminated wash water in the event of a malfunction. By monitoring the water quality of the washing tower, the expected efficiency can be ensured at all times. A fault report collected from the washing towers is output to the BMS system, which the technology is automatically stopped. The entire system is automatically operated, so risks from human error are eliminated. 2. Active carbon tower: The tower has a redundant design, so that the redundant tower can be used both in case of a change of charge and in case of a disaster. A the weight of the load is measured, allowing the saturation of the load to be monitored continuously, the saturation of the load the system will automatically switch to the redundant branch, both loaded saturation and in the event of a system fault signal, the technology automatically shut down ensure that no environmental emissions can occur due to operational errors.

ID	Title	Technological process	Pollutant-substance	Method of separation	Separation efficiency	Emergency management
				The system is equipped with a real-time emission measurement system to ensure continuous NMP emissions below 1mg/m³.		
P39	Anode foil treatment (BD building)	anode foil incinerator extraction room ventilation	Solid material Nickel Cobalt Manganese Aluminium Lithium Graphite Hydrogen chloride Hydrogen fluoride	A multi-stage separation process has been selected to separate the high-temperature fumes from the anode foil treatment to ensure that the emissions of each pollutant are kept below the limit value. airflow. The separation process consists of the following steps: 5. Two-step washing with Venturi washer, VENTURI-8000-CLEAN-ASSOCLEAN-64: a Venturi scrubbers can be used for gas stream cooling, so in this stage the first stage separation is performed while cooling the polluted air stream. For extraction the polluted air stream first enters the closed Venturi head, which is the washing liquid, in this case water, is also added tangentially. From accelerated polluted air stream atomizes the washing liquid, leaving a fine and it'll take you away in droplets. The result is an intense mixing between the polluted air and the liquid droplets. The washing liquid is thus washes the dust particles out of the gas, while water-soluble impurities are dissolved in the wash water. Economical separation range is 0.1-1 microns, i.e. the range of fumes, mists, dusts whose particles are subject to chemical reaction, are produced by a change in physical state or by condensation of vapour. The purified the air stream is discharged at the top of the separator and the washing liquid is discharged into the recirculation tank. 6. Condensation: the air stream cleaned by the Venturi scrubber further cooled, whereby the air stream is further cooled, one of the main purposes of which is to the moisture content of the air stream is reduced, so that the efficiency of the subsequent separation processes is increased. 7. Dust separation: dust separation is achieved by a two-stage filter unit, with a bag in the first stage and an H13 hepa filter in the second stage separating the particles in the air stream. The two-stage unit is designed to a coarse filtration is carried out in the first step to prevent the H13 fine filter from clogging. In both cases, a classical filtration operation is carried , whereby filters suitable for the separation of a given particle size are particles of the fineness of the filters are separated from the air flow forced through by the pressure difference. With the Hepa filter used in the final step, very fine particles between 0.1 and 0.001 micron are also separated with high efficiency. 8. Redundant activated charcoal filtration, FKUBO-1-REDUNDANT: the air stream separated from the fine particles is passed through an activated charcoal tower as the final step in the separation process, whereby any remaining solvents are also separated with high efficiency. The principle of separation is that solvents in the air stream are bound by activated carbon. The adsorbent is selected on the basis of the pollutants in the air stream in order to achieve the most efficient decoupling should be . When sequestering organic substances, the most common	70%	1. The Venturi washer has its own damage prevention tray to ensure a to catch contaminated wash water in the event of a malfunction to be cost. By monitoring the water quality of the washing tower, the expected efficiency can be ensured at all times. The fault reports collected from the washing towers are output to the BMS system, which the technology is automatically stopped. The entire system is automatically operated, so risks from human error are eliminated. 2. Dust separation: differential pressure sensors are installed to detect clogging of the filter fabric, which give a central signal to the technology about the need to change the filter or about , the technology will be automatically shut down, if the filters do not function properly (e.g. filter fabric tears, etc.). The filters have a built-in draining system and a post-cleaning function. All suctions are of redundant design, so that in case of failure the airflow is automatically diverted to the redundant side. 3. Active carbon tower: The tower has a redundant design, so that the redundant tower can be used both in case of a change of charge and in case of a disaster. A the weight of the load is measured, allowing the saturation of the load to be monitored continuously, the saturation of the load the system will automatically switch to the redundant branch, both loaded saturation and the system

ID	Title	Technological process	Pollutant-substance	Method of separation	Separation efficiency	Emergency management
				The adsorbent used is activated carbon, but the exact type of activated carbon is also specified to ensure the highest possible degree of separation. Adsorbent type: supersorbon activated carbon - a new development in high adsorption Supersorbon is a steam-activated carbon based on coconut shell with a special pore structure and a large internal surface area. The activated carbon is dust-free and has a high hardness and adsorption capacity. Supersorbon is produced an acid washing process to achieve low ash content and low iron content. This type of activated carbon can also be used to separate low boiling and flammable solvents. The adsorption binding capacity of CTC is above 85 % by weight. 9. Redundant design: two equivalent Venturi scrubbers, a dust filter and an activated carbon filter, each capable of handling the entire airflow.		the technology is automatically shut down in the event of a fault signalensuring that no environmental emissions can occur due to an operational fault.
P40	Test building 1	test equipment technological removals	Solid material Nickel Cobalt Manganese Aluminium Lithium Graphite Hydrogen chloride Hydrogen fluoride	The polluted air streams from the test equipment to be installed in the building will be collected in 2 ducts, which are are released separately into the environment following the separation technology described above. The air stream to be captured particulates and volatile substances that must be separated before being released to the environment. The separation technology is therefore defined as a two-stage process, the first stage consisting of a pre-filter and bag filter combined with an H13 compact cartridge filter in the for efficient removal of particles in the air stream, and a second stage, an activated carbon tower, for the removal of volatile substances in the air stream. 1. CLEAN-ASSOCLEAN-104 pre-filter + bag filter + H13 compact cartridge filter: filter cartridge mechanical air filtration: radial from the process spaces concerned fans are used to extract the airflow, the particles the airflow are separated from the fluids passing through the filter media, the selection of the filter media is determined by the size of the particles to be separated, so that the given to achieve separation efficiency appropriate to the technology. The filtration is carried out in several stages, which are the filter types for each stage: G4 / F9 / H13 Filter class G4: These filters are called coarse dust filters or prefilters. They can separate dust particles that are visible to the eye. Particle size: between 50 - 5 microns Degree of separation: 90% Filter class F9: Fine filters, these are able to separate small dust particles (only visible under a microscope) such as pollen, abrasive dust, fine metal dust. Particle size: between 5 and 0.1 micron Degree of separation: 95% Filter class H13: Also called Hepa filters, sterile filters, these are mainly used used in air purifiers and hospital air handling systems where the aim is to create a sterile environment. They are able to filter out bacteria and viruses. Particle size: between 0.1 and 0.001 micron Separation efficiency: 99.99 % 2. Activated carbon charging tower - FKUBO The principle of capture is to harmful substances in the air stream before they are released into the environment, whereby a significant proportion of them are captured.	Dust: 99,9% Solvent: 80%	1. Dust filtration: Differential pressure to detect clogging of the filter fabric sensors are installed give a central signal to the technology when a filter needs to be changed, or , the technology is automatically shut down if the filters do not function properly (e.g. filter fabric tears, etc.). The filters have a built-in exhaust system and a post-cleaning function. All extraction systems are redundant, so that in the event of a failure, the filter is automatically diverted to the next stage of the process. airflow to the redundant side. 2. Active carbon tower: The tower has a redundant design, so that the redundant tower can be used both in case of a change of charge and in case of a disaster. A the weight of the load is measured, allowing the saturation of the load to be monitored continuously, the saturation of the load the system will automatically switch to the redundant branch, both loaded saturation and in the event of a system fault signal, the technology automatically shut down ensure that no environmental emissions can occur due to operational errors.

ID	Title	Technological process	Pollutant-substance	Method of separation	Separation efficiency	Emergency management
				The adsorbent was selected on the basis of the pollutants in the air stream to achieve the most efficient separation possible. The most commonly used adsorbent for organic matter sequestration is activated carbon, but the exact type of activated carbon is specified to ensure the highest possible degree of separation. Adsorbent type: supersorbon activated carbon - a new development of high adsorption activated carbon Supersorbon is a steam-activated carbon based on coconut shell with a special pore structure and a large internal surface area. The activated carbon is dust-free and has a high hardness and high adsorption capacity. Supersorbon is produced by an acid washing process with low ash content and low to achieve iron content. This type of activated carbon can also be used to separate low boiling and flammable solvents. The CTC adsorption binder above 85 % by weight.		
P41	Test building 2	test equipment technological removals	Solid material Nickel Cobalt Manganese Aluminium Lithium Graphite Hydrogen chloride Hydrogen fluoride	The polluted air streams from the test equipment to be installed in the building will be collected in 2 ducts, which are are released separately into the environment following the separation technology described above. The air stream to be captured particulates and volatile substances that must be separated before being released to the environment. The separation technology is therefore defined as a two-stage process, the first stage consisting of a pre-filter and bag filter combined with an H13 compact cartridge filter in the for efficient removal of particles in the air stream, and a second stage, an activated carbon tower, for the removal of volatile substances in the air stream. 1. CLEAN-ASSOCLEAN-104 pre-filter + bag filter + H13 compact cartridge filter: filter cartridge mechanical air filtration: radial from the process spaces concerned fans are used to extract the airflow, the particles the airflow are separated from the fluids passing through the filter media, the selection of the filter media is determined by the size of the particles to be separated, so that the given to achieve separation efficiency appropriate to the technology. The filtration is carried out in several stages, which are the filter types for each stage: G4 / F9 / H13 Filter class G4: These filters are called coarse dust filters or prefilters. They can separate dust particles that are visible to the eye. Particle size: between 50 - 5 microns Degree of separation: 90% Filter class F9: Fine filters, these are able to separate small dust particles (only visible under a microscope) such as pollen, abrasive dust, fine metal dust. Particle size: between 5 and 0.1 micron Degree of separation: 95% Filter class H13: Also called Hepa filters, sterile filters, these are mainly used used in air purifiers and hospital air handling systems where the aim is to create a sterile environment. They are able to filter out bacteria and viruses. Particle size: between 0.1 and 0.001 micron Separation efficiency: 99.99 % 2. Activated carbon charging tower - FKUBO The principle of capture is to harmful substances in the air stream before they are released into the environment, whereby a significant proportion of them are captured. The adsorbent is selected on the basis of the pollutants in the air stream so that	Dust: 99,9% Solvent: 80%	1. Dust filtration: Differential pressure to detect clogging of the filter fabric sensors are installed give a central signal to the technology when a filter needs to be changed, or , the technology is automatically stopped if the filters do not function properly (e.g. filter fabric tears, etc.). The filters have a built-in exhaust system and a post-cleaning function. All extraction systems are redundant, so that in the event of a failure, the filter is automatically diverted to the next stage of the process. airflow to the redundant side. 2. Active carbon tower: The tower has a redundant design, so that the redundant tower can be used both in case of a change of charge and in case of a disaster. A the weight of the load is measured, allowing the saturation of the load to be monitored continuously, the saturation of the load the system will automatically switch to the redundant branch, both loaded saturation and in the event of a system fault signal, the technology automatically shut down ensure that no environmental emissions can occur due to operational errors.

ID	Title	Technological process	Polluting substance	Method of separation	Separation efficiency	Emergency management
				to the most efficient separation possible. Activated carbon is the most commonly used adsorbent for the sequestration of organic substances, but the exact type of activated carbon is also specified to ensure the highest possible degree of detachment. Adsorbent type: supersorbon activated carbon - a new development of high adsorption activated carbon Supersorbon is a steam-activated carbon based on coconut shell with a special pore structure and a large internal surface area. The activated carbon is dust-free and has a high hardness and high adsorption capacity. Supersorbon is produced by an acid washing process with low ash content and low to achieve iron content. This type of activated carbon can also be used to separate low boiling and flammable solvents. The CTC adsorption binder above 85 % by weight.		
P42	Waste storage	ventilation of the waste storage room	Hydrogen fluoride Solid material	Ventilation of the entire room to remove contaminants potentially entering the airspace of the storage room after separation, it an air pollution control point source, thus avoiding fugitive emissions. The air stream to be captured particulates and volatile substances that must be separated before being released to the environment. The separation technology is therefore defined as a two-stage process, the first stage consisting of a pre-filter and bag filter combined with an H13 compact cartridge filter in the for efficient removal of particles in the air stream, and a second stage, an activated carbon tower, for the removal of volatile substances in the air stream. 1. CLEAN-ASSOCLEAN-64 pre-filter+ bag filter+ H13 compact cartridge filter: filter cartridge mechanical air filtration: radial from the process spaces concerned fans are used to extract the airflow, the particles the airflow are separated from the fluids passing through the filter media, the selection of the filter media is determined by the size of the particles to be separated, so that the given to achieve separation efficiency appropriate to the technology. The filtration is carried out in several stages, which are the filter types for each stage: G4 / F9 / H13 Filter class G4: These filters are called coarse dust filters or prefilters. They can separate dust particles that are visible to the eye. Particle size: between 50 - 5 microns Degree of separation: 90% Filter class F9: Fine filters, these are able to separate small dust particles (only visible under a microscope) such as pollen, abrasive dust, fine metal dust. Particle size: between 5 and 0.1 micron Degree of separation: 95% Filter class H13: Also called Hepa filters, sterile filters, these are mainly used used in air purifiers and hospital air handling systems where the aim is to create a sterile environment. They are able to filter out bacteria and viruses. Particle size: between 0.1 and 0.001 micron Separation efficiency: 99.99 % 2. Activated carbon charging tower - FKUBO-4-500 The principle of capture is to harmful substances in the air stream before they are released into the environment, whereby a significant proportion of them are captured. The adsorbent was selected on the basis of the pollutants in the air stream to achieve the most efficient separation possible. When binding organic substances, the the most commonly used adsorbent is activated carbon, but the specific activated carbon	Dust: 99,9% Solvent: 80%	1. Dust filtration: Differential pressure to detect clogging of the filter fabric sensors are installed give a central signal to the technology when a filter needs to be changed, or , the technology is automatically shut down if the filters do not function properly (e.g. filter fabric tears, etc.). The filters have a built-in exhaust system and a post-cleaning function. All extraction systems are redundant, so that in the event of a failure, the filter is automatically diverted to the next stage of the process. airflow to the redundant side. 2. Active carbon tower: The tower has a redundant design, so that the redundant tower can be used both in case of a change of charge and in case of a disaster. A the weight of the load is measured, allowing the saturation of the load to be monitored continuously, the saturation of the load the system will automatically switch to the redundant branch, both loaded saturation and in the event of a system fault signal, the technology automatically shut down ensure that no environmental emissions can occur due to operational errors.

ID	Title	Technological process	Pollutant-substance	Method of separation	Separation efficiency	Emergency management
				is also specified to ensure the highest possible degree of separation. Adsorbent type: supersorbon activated carbon - a new development of high adsorption activated carbon Supersorbon is a steam-activated carbon based on coconut shell with a special pore structure and a large internal surface area. The activated carbon is dust-free and has a high hardness and high adsorption capacity. Supersorbon is produced by an acid washing process with low ash content and low to achieve iron content. This type of activated carbon can also be used to separate low boiling and flammable solvents. The adsorption binding capacity of CTC is above 85 % by weight.		
P43	Raw material testing	technology test equipment exhausts	Dimethyl carbonate Ethylene carbonate Ethyl methyl carbonate Vinyl carbonate LiPF6 Hydrogen fluoride Solid material Nickel Cobalt Manganese Aluminium Lithium Graphite Hydrogen chloride	The process exhausts from the test facilities for testing the raw materials in the RM building are collected in a common collection duct, for separation and release. The air stream to be separated particulates and volatile substances that must be captured before being released to the environment. The separation technology, taking into account the qualitative and quantitative parameters, is defined as a two-stage process, the first stage consisting of a pre-filter and bag filter combined with an H13 compact cartridge filter for efficient removal of dust the air stream, and second stage consisting of an activated carbon packed tower for the removal of volatile substances in the air stream. 1. CLEAN-ASSOCLEAN-84 bag pre-filter + H13 compact cartridge filter: filter cartridge mechanical air filtration: radial from the process spaces concerned fans are used to extract the airflow, the particles the airflow are separated from the fluids passing through the filter media, the selection of the filter media is determined by the size of the particles to be separated, so that the given to achieve separation efficiency appropriate to the technology. The filtration is carried out in several stages, which are the filter types for each stage: G4 / F9 / H13 Filter class G4: These filters are called coarse dust filters or prefilters. They can separate dust particles that are visible to the eye. Particle size: between 50 - 5 microns Degree of separation: 90% Filter class F9: Fine filters, these are able to separate small dust particles (only visible under a microscope) such as pollen, abrasive dust, fine metal dust. Particle size: between 5 and 0.1 micron Degree of separation: 95% Filter class H13: Also called Hepa filters, sterile filters, these are mainly used used in air purifiers and hospital air handling systems where the aim is to create a sterile environment. They are able to filter out bacteria and viruses. Particle size: between 0.1 and 0.001 micron Separation efficiency: 99.99 % 2. Activated carbon charging tower - FKUBO-6-500 The principle of capture is to harmful substances in the air stream before they are released into the environment, whereby a significant proportion of them are captured. The adsorbent is selected on the basis of the harmful substances in the air stream to achieve the most efficient separation possible. The most commonly used adsorbent for organic matter sequestration is activated carbon, but the exact type of activated carbon is also specified to ensure the highest possible degree of separation.	Dust: 99,9% Solvent: 80%	1. Dust filtration: Differential pressure to detect clogging of the filter fabric sensors are installed give a central signal to the technology when a filter needs to be changed, or , the technology is automatically stopped if the filters do not function properly (e.g. filter fabric tears, etc.). The filters have a built-in exhaust system and a post-cleaning function. All extraction systems are redundant, so that in the event of a failure, the filter is automatically diverted to the next stage of the process. airflow to the redundant side. 2. Active carbon tower: The tower has a redundant design, so that the redundant tower can be used both in case of a change of charge and in case of a disaster. A the weight of the load is measured, allowing the saturation of the load to be monitored continuously, the saturation of the load the system will automatically switch to the redundant branch, both loaded saturation and in the event of a system fault signal, the technology automatically shut down ensure that no environmental emissions can occur due to operational errors.

ID	Title	Technological process	Pollutant-substance	Method of separation	Separation efficiency	Emergency management
				Adsorbent type: supersorbon activated carbon - a new development of high adsorption activated carbon Supersorbon is a steam-activated carbon based on coconut shell with a special pore structure and a large internal surface area. The activated carbon is dust-free and has a high hardness and high adsorption capacity. Supersorbon is produced by an acid washing process with low ash content and low to achieve iron content. This type of activated carbon can also be used to separate low boiling and flammable solvents. The adsorption binding capacity of CTC is above 85 % by weight.		
P50	Sewage treatment suction		Stink	active carbon tower	99%	The activated carbon charge is replaced regularly. The charge to an operator holding a waste management licence.

Note: process emissions associated with certain technological processes are treated and emitted jointly, taking into account the pollutants in the exhaust air streams.

7.1.3.2. Modelling the impacts on the environment

The impact of the point sources of air pollution to be installed in the area was modelled using the Aermod View 12.0.0 software, taking into account the input data given above.

The Aermod View 12.0.0 software uses the Gaussian distribution, which is also used in the national standard, for modelling. It takes into account the US EPA's best modeling practice recommendations.

A series of verification tests carried out by the US EPA in several phases confirmed that the Aermod model values for NO_x and NO_2 are closest to the actual meteorological conditions at the receptor point at the 98th percentile for NOx and 99% percentile for particulate matter. Accordingly, the 98th percentile of the calculated results for NO_2 and NO_x was used in the modelling, while the 99th percentile for particulate matter was used.

The Nickel and Copper components were modelled in conjunction with the cooling towers with respect to potential emissions from the cooling towers, which is discussed in Section 7.1.3.5. An assessment of the anticipated stench load at the P50 point source and the potential stench load from the pollutants to be emitted is presented in Section 7.1.3.6.

74. Table 3: Calculation results of air pollutant dispersion modelling [$\mu g/m^3$]

Pollutants	Maximum value of 60-minute averages	Threshold	24 hour averages maximum Value	Threshold	Annual averages maximum value	Threshold
Aluminium	16,09	-	2,34	50	0,71	40
Graphite	2,86	-	1,85	50	0,29	40
Carboxymethyl cellulose	0,016	-	0,002	50	0,0004	40
CO	132	10000	46,85	5000	6,08	3000
Kitchen extraction (paraffin hydrocarbons)	172,49	500	19,42	500	2,33	-
Dimethyl carbonate	158,8	300	20,64	300	6,4	-
Ethylene carbonate	78,8	300	10,52	300	3,23	-
Ethyl methyl carbonate	78,8	300	10,56	300	3,15	-
Hydrogen chloride	0,54	20	0,44	10	0,06	-
Hydrogen fluoride	0,46	20	0,07	5	0,02	-
$LiPF_6$	8,08	20	1,07	5	0,31	-
NMHC	3,01	500	0,33	500	0,06	-
NMP	16,25	100	3,35	50	0,82	-
NO_2	77,96	100	49,92	85	9,32	40
NO_X	87	200	55,58	150	10,36	-
Stationary powder	-	-	18,71	50	3,73	40
PVDF	0,014	-	0,002	50	0,0004	40
Silicon	0,06	-	0,008	50	0,002	40
Sulphur dioxide	29,69	250	18,93	150	2,28	50
Stink	0,045	-	0,008	-	0,001	-
Vinyl carbonate	16,09	-	2,04	-	0,66	5
Poliacrylic acid	8,03	10	1,44	10	0,38	-

Pollutants	Maximum value of 60-minute averages	Threshold	24 hour averages maximum Value	Threshold	Annual averages maximum value	Threshold
Diethylene glycol	1,44	200	0,24	100	0,06	-

75. Table 1: Calculation results with background exposure [μg/m3]

Polluting substance	60-minute averages maximum Value	Threshold	24 hour averages maximum Value	Threshold	Maximum value of annual averages	Threshold
CO	539,8	10000	456,85	5000	114,08	3000
NOx	104	200	72,58	150	27,36	-
NO2	90,08	100	61,37	70	20,96	40
Stationary powder	-	-	38,71	50	23,73	40
SO2	30,69	250	19,93	150	3,28	50

Based on the calculation results prepared on the basis of the investor's data, the calculated loads remain below the health limits and the design guideline values.

The modelling results for nickel, copper, cobalt, lithium and iron for the assessment of the combined effect with cooling towers are presented in chapter 7.1.3.5 and in expert opinion attached in the Annex.

7.1.3.3. Description of measurement obligations

The measurement obligations for the air quality point sources to be installed are given below.

- During the test run of the installation, the emission characteristics of all installed point sources should be checked.
- For T1-T6 technologies, the control measurement is required to be carried out at annual intervals according to the provisions of Article 15 and Annex 14 of Decree 6/2011 (I. 14.) VM.
- No emission limit value is available for T7 technology. Pursuant to Article 30 (1) of Government Decree 306/2010 (23.XII.), activities involving stench may be carried out using the best available techniques. As described in chapter 7.1.3.6, the calculations carried out indicate that the facility will not have a stench protection area, in view of which it is proposed to carry out a monitoring measurement every 5 years pursuant to Article 15, paragraph 4 of Decree 6/2011 (14 January 2011) of the Ministry of Transport and Communications. Pursuant to § 30 (4) Government Decree 306/2010 (XII. 23.), the measurement shall be carried out in accordance with the standard MSZ EN 13725:2003.
- In the case of T8 technology, according to the provisions of § 15 and Annex 14 of Decree 6/2011 (I. 14.) VM of 14.1.2011, the control measurement must be carried out every 5 years
- In the case of technology T9 (Heat Supply), according to Article 8 (2) (c) of Decree 53/2017 (X. 18.) of the FM, the emission measurement for point sources P47-P48 must be carried out once a year. For the other point sources belonging to this technology (P44-P46; P49), the measurement is required every three years pursuant to § 8(2)(c) of the Ordinance

- In the case of T10 technology, according to § 4, paragraph 13 of the Decree 53/2017 (X. 18.) of the FM 4, the emission limit values for stationary engines do not apply to engines with a rated thermal input of less than 1 $_{MWth}$ and a fuel consumption of less than 50 kg/h. In view of this, there is no obligation to measure.

With reference to the possibility provided for in Article 15(2) of VM Decree 6/2011 (14.I.), it is proposed to consider the possibility of providing the possibility of rotational measurement for T8 and T9 technologies.

7.1.3.4. Solvent balance of the planned activity

For the site, a solvent balance is required in accordance with the European Commission Implementing Decision 2020/2009, BAT 1 and BAT 10. In order to determine the exact emissions, a process level solvent balance for NMP, electrolyte and DMC (dimethyl carbonate) has also been prepared.

In relation to NMP, material flows have been defined by the Permittee and the Designer, which specify in detail the amount of NMP that will be released during each process step. Based on this detailed calculation, the annual solvent balance of the technology was developed as follows.

76. Table 1: Annual NMP balance of the proposed technology

B1	B2	K1	K2	K3	K4	K5	K6	K7	K8	K9
16612,20	0,00	1,19	0,04	2,52	0,0	5,82	16602,64	0,0	0,0	0,0

Taking into account the above table and the detailed solvent balance attached in Annex 1.5, the following can be concluded due to its size:

- The amount of NMP projected to be used annually at full capacity in the installation is 16612,2 tonnes, which:
  - Quantity planned to be used for the production of cathode slurry: 10289,4 t/year
  - CNT slurry NMP content: 6322,8 t/year
- The maximum amount of NMP released at point sources was 1.19 tonnes per year.
- The calculated amount of solvent discharged into the sewerage network is 0.04 tonnes/year.
- On an annual basis, 2.52 tonnes of NMP is shipped from the site as part of the batteries.
- No fugitive emissions are expected from the site, given the closed technology and the direct and full hall exhaust.
- The amount of NMP dismantled at the treatment plant is 5.82 tonnes per year.
- The recovered NMP is transferred as waste, or may be used as residues in packaging waste and activated carbon filters. It also appears as waste in waste slurry and other waste from manufacturing.
- No other emissions are expected.

It should be noted that the applicant envisages that the waste NMP will be recycled by a licensed waste management company into industrial grade NMP using distillation technology for reuse. The expected recycling rate is ~90%.

A balance sheet of electrolyte and DMC consumption is also attached in Annex 1.5. The balances are, identically for NMP, they follow the whole technology.

In the case of electrolyte, a significant proportion of the amount used leaves the plant as part of the product. Smaller amounts are transferred as waste or discharged at point sources and are decomposed in the wastewater treatment plant. Due to the closed system, no fugitive emissions are expected.

For DMC, no sewage discharges are suspected. DMC is in the product only as a component of the electrolyte and is not present as pure DMC in the product. Due to the closed system, fugitive emissions of this substance can be excluded. DMC is therefore emitted at the point source in minimal quantities and is predominantly transported off-site as waste.

7.1.3.5. Assessment of the air protection effects expected from the supply of grey water to cooling towers

The air quality modelling of the cooling towers was carried out by Enviro-Expert Ltd. Several point sources within the plant emit the same material as the cooling tower. These are nickel, copper, iron, cobalt, manganese, lithium. In order to assess the cumulative effects of these substances, the combined effects of the point sources and the cooling towers were also assessed by Enviro-Expert Ltd. Their documentation is attached as Annex 1.6 to this permit application.

The modelling results for the combined effect of point sources and cooling towers are presented below:

77. Table 1: Maximum air pollutant concentrations in the factory area

Polluter	CAS	Averaging time	Immission limit value (µg/m³)	Maximum air concentration in the factory area (µg/m³)	Compliance
Nickel	7440-02-0	annual	0,025	0,016	corresponding to
Copper	7440-50-8	24 hours	1	0,134	corresponding to
Cobalt	7440-48-4	24 hours	0,1	0,013	corresponding to
Lithium	7439-93-2	24 hours	-	0,027	-
Iron	7439-89-6	24 hours	-	0,157	-
Manganese	7439-96-5	24 hours	1	0,019	corresponding to

The full documentation and a map of the modelling results are attached in Annex 1.6. The greywater quality parameters considered are presented in Annex 1.28.

7.1.3.6. Calculation of the expected odour load of the installation

As described in Sections 4.6.2.1 and 7.1.3.1, stench emissions are assumed at the P50 point source connected to the WWTP, and will be minimised by the installation of an activated carbon filter. Based on the results of the air quality protection transport modelling (presented in chapter 7.1.3.2) carried out for the P50 point source as a source of odour emissions, the expected odour load will not exceed 1.5 ODP, which is the limit value for wastewater treatment plants according to Annex 1, point 3 of the Decree 4/2011 (14.I.) of the Ministry of Transport and Communications, in the context of the delimitation of the odour protection zone.

In view of the above, it is not possible to establish an area of influence from an odour protection point of view for a point source with potential odour emissions based on the process description.

We also investigated the odour impact of the pollutants that the technology is expected to emit, based on literature data. The limit concentrations (1 OU) for substances with odour-emitting concentrations based on literature data and safety data sheets are given in Table 78. Where extreme values were given based on literature data, the lower value was used.

In the case of kitchen extraction, the oil used for frying can be investigated as a source of odour, but in the case of sunflower oil vapour containing a mixture of volatile organic compounds, the literature does not provide information on the odour-emitting concentration of the mixture. In view of this, the assessment was carried out taking into account the odour threshold of acrolein as one of the typical odour-emitting components. It should be stressed that, as described above, acrolein is only one characteristic component taken as a reference for kitchen extraction, but the calculated odour concentration is not for this substance but for the whole extraction.

78. Table 2: Comparison of the limit concentration of the odour-emitting substances with the modelled concentration

Component	**Molecular weight**	**Odour concentration**		**Expected aggregate air pollution**
	[g/mol]	**ppm***	**[µg/m³]**	**[µg/m³]**
NMP	99,13	4	17691,74	16,25
Hydrogen chloride	36,46	0,8	1301,40	6,15
Hydrogen fluoride	20,01	0,04	35,71	4,8
SO2	64,07	0,67	1915,29	29,69
NOX	46,01	0,1	205,29	87
Kitchen extraction (acrolein)	56,06	0,1	250,13	172,49

**The source of the odour-evoking concentrations [ppm] is shown below:*

- *NMP: OARS WEEL - Workplace Environmental Exposure Level - n-METHYL-2-PYRROLIDONE (NMP)*
- *Hydrogen Chloride: IVHHN - Public information - Information on different volcanic gases - Hydrogen Chloride*
- *Hydrogen fluoride: Hydrogen Fluoride (HF)| Medical Management Guidelines| Toxic Substance Portal| ATSDR (cdc.gov)*
- *SO2: Sulfur Dioxide Acute Exposure Guideline Levels - Acute Exposure Guideline Levels for Selected Airborne Chemicals - NCBI Bookshelf*
- *NOX: National Library of Medicine Natonal Center for Biotechnology Information, Nitrogen dioxide - WHO Guidelines for Indoor Air Quality: Selected Pollutants - NCBI Bookshelf*
- *Akrolein: Nutritional, Utility, and Sensory Quality and Safety of Sunflower Oil on the Central European Market*

In the literature, odour-evoked concentrations are typically in ppm, which needs to be converted to µg/m^3 for comparison with model results.

This requires the use of the molar mass of a given substance and the universal gas constant, given normal atmospheric pressure and normal gases, as follows:

$$n = (p * V) / (R * T)$$

where:

- n: number of moles of the given material
- p: normal atmospheric pressure (101 325 Pa)
- V: volume of the substance
- R: universal gas constant (8.314 J/mol*K)
- T: ambient temperature (273,15 K)

The table shows that, taking into account the results of the calculations carried out on the basis of the data provided by the Sponsor and the Designer, the maximum air exposure of the activity is below the concentrations that can be considered as a high certainty of odour.

Enviro-Expert Ltd. also carried out an assessment of the potential stench exposure of the cooling towers. The calculation also took into account the impact of the P50 point source and kitchen emissions as a potential source of odour, the latter with an estimated emission value of 50 odour units/m[(3).] Although the assessment uses a different approach for kitchen emissions, the results obtained show a similar picture. The result of the calculation indicates a maximum odour concentration of 0,63335 OO/m^3 within the plant site. The documentation is attached as Annex 1.6 to the permit application.

7.1.3.7. Off-site transport

The air quality protection effects of the increase in road traffic generated by the operation of the facility are assessed in the
are presented below.

The specific emission values for passenger cars, trucks and buses were determined using the Road Transport Emission Factors for Road Transport (HBEFA). This manual is a software database developed by the German, Swiss and Austrian environmental agencies and the Joint Research Centre (JRC). The correspondence between the database and the Hungarian emission data was investigated by the Department of Fluid Mechanics of the BME in 2015, based data from 2001 to 2006 and field measurements, which showed a 4-year difference between the German and Hungarian emission data. Given that in recent years the average age difference between the two countries' vehicle fleets has increased by 2 years compared to the period under study, we have calculated emissions using 6 years of data from Germany.

79. Table 1: Specific emission factors for passenger cars in 2018 in Hungary (g/km)

Operating mode km/h	CO	CH (FID)	NO2	NOx	PM
30	0,32	0,03	0,14	0,44	0,01
40	0,27	0,02	0,13	0,39	0,01
50	0,29	0,02	0,12	0,37	0,01
60	0,26	0,02	0,11	0,33	0,01
70	0,28	0,02	0,11	0,33	0,01
80	0,22	0,01	0,09	0,29	0,01
90	0,24	0,01	0,10	0,31	0,01
100	0,31	0,01	0,11	0,34	0,01
110	0,44	0,02	0,13	0,39	0,01
120	0,66	0,02	0,17	0,50	0,01
Operating mode	**CO**	**CH (FID)**	NO2	NOx	**PM**

km/h					
130	1,14	0,02	0,22	0,65	0,01

80. Table 1: Specific emission factors of buses in 2018 in Hungary (g/km)

Operating mode km/h	CO	CH (FID)	NO2	NOx	PM
30	2,54	0,44	1,91	12,53	0,17
40	1,92	0,32	1,34	9,41	0,14
50	1,59	0,28	1,07	7,64	0,12
60	1,21	0,22	0,81	5,95	0,09
70	1,08	0,18	0,69	5,20	0,08
80	1,03	0,16	0,65	4,75	0,08
90	0,95	0,14	0,61	4,49	0,08
100	0,88	0,14	0,62	4,50	0,07

81. Table 1: Specific emission factors for heavy goods vehicles over 3.5 t specific emission factors in 2018 in Hungary (g/km)

Operating mode km/h	CO	CH (FID)	NO2	NOx	PM
30	1,57	0,17	0,53	5,87	0,08
40	1,53	0,13	0,45	4,85	0,07
50	1,21	0,12	0,39	4,23	0,06
60	1,02	0,10	0,31	3,33	0,05
70	1,06	0,08	0,30	3,09	0,05
80	1,10	0,07	0,28	2,69	0,05
90	1,04	0,06	0,25	2,37	0,04
100	1,00	0,06	0,25	2,35	0,04

The baseline data used in the calculation are as shown in Table 37 and Table 38. The flows taken into account are described from Table 39 to Table 44.

The expected loads are given for the construction, operation, and long-term periods from Table 45 to Table 52. The calculated increment from the baseline load is shown in Table 66, Table 83 and Table 86. The expected load during operation was determined as a function of the maximum expected additional traffic. The results of the calculations show that the emission concentrations on the axes of the roads concerned do not exceed the health limit values in the baseline condition, with a small additional traffic load due to the additional traffic generated by the project. Table 67, Table 84 and Table 87 show the expected immission loads at the nearest protected zones, which indicate that the health limits can be maintained along the line of the protected zones. It should also be pointed out that the projections of expected traffic are based on the logic that passenger and goods vehicle loads will increase steadily over time as development occurs in the areas concerned. By comparing the values in Table 65, Table 82 and Table 85, it can be stated that the forecast values, with the exception of the passenger car figure, significantly exceed the actual generated impact of the planned investment, and therefore it can be stated that lower traffic volumes than those presented can be expected in the long term.

Overall, it can be concluded that the additional traffic generated by the planned facility will not cause significant changes to the environment of the roads used for transport, either during operation or in the longer term.

82. Table 1: Air quality protection calculation results for the operational phase (2027)

Name of road		M35 motorway north	M35 motorway south	Highway 33	Route 354	Northern access About M35	BMW Boulevard North	BMW Boulevard East	BMW Boulevard West	BMW Boulevard South	Health limit value
CO	Emission (mg/m*s)	0,452	0,478	0,321	0,261	0,112	0,022	0,072	0,007	0,112	
	Emission maximum (μg/m³)	213,321	225,257	46,671	37,910	52,669	3,246	10,728	2,026	16,247	10000
	(a) Criterion (m)	N.É.	N.É.	N.É.	N.É.	N.É.	N.É.	N.É.	N.É.	N.É.	
	(b) Criterion area of influence (m)	N.É.	N.É.	N.É.	N.É.	N.É.	N.É.	N.É.	N.É.	N.É.	
	(c) Criterion area of influence (m)	2	2	2	2	2	2	2	2	2	
CH	Emission (mg/m*s)	0,013	0,014	0,009	0,007	0,011	0,002	0,007	<0,001	0,013	
	Emission maximum (μg/m³)	6,114	6,517	1,253	0,955	5,386	0,277	1,069	0,166	1,930	500
	(a) Criterion (m)	N.É.	N.É.	N.É.	N.É.	N.É.	N.É.	N.É.	N.É.	N.É.	
	(b) Criterion area of influence (m)	N.É.	N.É.	N.É.	N.É.	N.É.	N.É.	N.É.	N.É.	N.É.	
	(c) Criterion area of influence (m)	2	2	2	2	2	2	2	2	2	
NOx	Emission (mg/m*s)	0,517	0,537	0,256	0,192	0,376	0,047	0,239	0,012	0,404	
	Emission maximum (μg/m³)	243,805	253,259	37,195	27,878	177,298	6,858	35,719	3,567	58,704	200
	(a) Criterion (m)	13	13	2	1	9	N.É.	2	N.É.	3	
	(b) Criterion area of influence (m)	7	8	1	N.É.	5	N.É.	1	N.É.	2	
	(c) Criterion area of influence (m)	2	2	2	2	2	2	2	2	2	
NO2	Emission (mg/m*s)	0,119	0,125	0,072	0,051	0,040	0,009	0,025	0,003	0,048	
	Emission maximum (μg/m³)	56,002	59,105	10,441	7,447	18,641	1,335	3,666	0,883	7,005	100
	(a) Criterion (m)	6	6	1	N.É.	2	N.É.	N.É.	N.É.	N.É.	
	(b) Criterion area of influence (m)	4	4	N.É.	N.É.	1	N.É.	N.É.	N.É.	N.É.	
	(c) Criterion area of influence (m)	2	2	2	2	2	2	2	2	2	
PM	Emission (mg/m*s)	0,011	0,012	0,006	0,004	0,006	<0,001	0,004	<0,001	0,006	
	Emission maximum (μg/m³)	1,285	1,372	0,210	0,137	0,663	0,028	0,133	0,015	0,222	50
	(a) Criterion (m)	N.É.	N.É.	N.É.	N.É.	N.É.	N.É.	N.É.	N.É.	N.É.	
	(b) Criterion area of influence (m)	N.É.	N.É.	N.É.	N.É.	N.É.	N.É.	N.É.	N.É.	N.É.	
	(c) Criterion area of influence (m)	2	2	2	2	2	2	2	2	2	

83. Table 1: Changes in the air quality protection burden on roads during the operational phase (2027) (expected increases)

Name of road		M35 motorway north	M35 motorway south	Highway 33	Route 354	Northern access About M35	BMW Boulevard North	BMW Boulevard East	BMW Boulevard West	BMW Boulevard South
CO	Emission (mg/m*s)	0,011	0,007	0,009	0,004	0,004	0,014	0,004	0,002	0,004
	Emission maximum (μg/m³)	5,146	3,435	1,320	0,540	1,842	2,021	0,584	0,692	0,568
	Change in area of influence [m]	0	0	0	0	0	0	0	0	0
CH	Emission (mg/m*s)	<0,001	<0,001	<0,001	<0,001	<0,001	0,001	<0,001	<0,001	<0,001
	Emission maximum (μg/m³)	0,131	0,103	0,021	0,010	0,158	0,172	0,050	0,056	0,049
	Change in area of influence [m]	0	0	0	0	0	0	0	0	0
NOx	Emission (mg/m*s)	0,010	0,008	0,005	0,003	0,009	0,030	0,009	0,004	0,009
	Emission maximum (μg/m³)	4,845	3,864	0,756	0,365	4,249	4,417	1,348	1,171	1,310
	Change in area of influence [m]	1	0	0	0	0	0	0	0	1
NO2	Emission (mg/m*s)	0,002	0,002	0,002	<0,001	0,002	0,006	0,002	0,001	0,002
	Emission maximum (μg/m³)	1,099	0,765	0,257	0,111	0,715	0,805	0,227	0,304	0,221
	Change in area of influence [m]	0	0	0	0	0	0	0	0	0
PM	Emission (mg/m*s)	<0,001	<0,001	<0,001	<0,001	<0,001	<0,001	<0,001	<0,001	<0,001
	Emission maximum (μg/m³)	0,032	0,029	<0,01	<0,01	0,023	0,018	<0,01	<0,01	<0,01
	Change in area of influence [m]	0	0	0	0	0	0	0	0	0

84. Table 3: Calculated emission concentrations at the nearest line of protection during the operational phase (2027)

Name of road		M35 motorway north	M35 motorway south	Highway 33	Route 354	Northern access About M35	BMW Boulevard North	BMW Boulevard East	BMW Boulevard West	BMW Boulevard South	Health limit value
CO	**Emission maximum (μg/m³)**	1,618	2,644	0,666	0,058	0,338	<0,01	0,015	<0,01	0,042	10000
CH	**Emission maximum (μg/m³)**	0,046	0,076	0,018	<0,01	0,035	<0,01	<0,01	<0,01	<0,01	500
NOx	**Emission maximum (μg/m³)**	1,850	2,972	0,530	0,043	1,138	<0,01	0,049	<0,01	0,152	200
NO2	**Emission maximum (μg/m³)**	0,425	0,694	0,149	0,011	0,120	<0,01	<0,01	<0,01	0,018	100
PM	**Emission maximum (μg/m³)**	<0,01	0,016	<0,01	<0,01	<0,01	<0,01	<0,01	<0,01	<0,01	50

As can be seen from the modelling results, the immission concentrations calculated taking into account the prevailing wind direction for the road sections concerned result in NOx concentrations above the health limit value along the axis of the road for the sections of the M35 motorway under consideration, but without any persistent human presence. For the other road sections, no pollutant loads above the limit values are expected along the axis of the carriageway. For the nearest protected zones, no loads above the limit value are expected.

85. Table 1: Air quality protection calculation results for the long-term (2042)

Name of road		M35 motorway North	M35 motorway south	Highway 33	Route 354	Northern access About M35	BMW Boulevard North	BMW Boulevard East	BMW Boulevard West	BMW Boulevard South	Health limit value
CO	**Emission (mg/m*s)**	0,581	0,611	0,337	0,278	0,145	0,024	0,094	0,008	0,136	
	Emission maximum (μg/m³)	273,956	288,215	49,010	40,450	68,288	3,430	14,001	2,213	19,774	10000
	(a) Criterion (m)	N.É.	N.É.	N.É.	N.É.	N.É.	N.É.	N.É.	N.É.	N.É.	
	(b) Criterion area of influence (m)	N.É.	N.É.	N.É.	N.É.	N.É.	N.É.	N.É.	N.É.	N.É.	
	(c) Criterion area of influence (m)	2	2	2	2	2	2	2	2	2	
CH	**Emission (mg/m*s)**	0,016	0,017	0,009	0,007	0,015	0,002	0,009	<0,001	0,016	
	Emission maximum (μg/m³)	7,755	8,221	1,284	0,995	6,843	0,291	1,375	0,179	2,256	500
	(a) Criterion (m)	N.É.	N.É.	N.É.	N.É.	N.É.	N.É.	N.É.	N.É.	N.É.	
	(b) Criterion area of influence (m)	N.É.	N.É.	N.É.	N.É.	N.É.	N.É.	N.É.	N.É.	N.É.	
	(c) Criterion area of influence (m)	2	2	2	2	2	2	2	2	2	
NOx	**Emission (mg/m*s)**	0,664	0,691	0,304	0,229	0,484	0,049	0,310	0,013	0,481	
	Emission maximum (μg/m³)	313,110	325,885	44,240	33,252	228,093	7,189	46,420	3,851	69,940	200
	(a) Criterion (m)	16	17	2	1	12	N.É.	2	N.É.	4	
	(b) Criterion area of influence (m)	9	10	1	N.É.	7	N.É.	1	N.É.	2	
	(c) Criterion area of influence (m)	2	2	2	2	2	2	2	2	2	
NO2	**Emission (mg/m*s)**	0,154	0,163	0,084	0,060	0,050	0,010	0,031	0,003	0,056	
	Emission maximum (μg/m³)	72,685	76,880	12,177	8,666	23,471	1,405	4,675	0,956	8,107	100
	(a) Criterion (m)	8	8	1	N.É.	2	N.É.	N.É.	N.É.	N.É.	
	(b) Criterion area of influence (m)	5	5	N.É.	N.É.	1	N.É.	N.É.	N.É.	N.É.	
	(c) Criterion area of influence (m)	2	2	2	2	2	2	2	2	2	
PM	**Emission (mg/m*s)**	0,015	0,016	0,007	0,005	0,007	<0,001	0,005	<0,001	0,008	
	Emission maximum (μg/m³)	1,643	1,758	0,246	0,162	0,842	0,029	0,171	0,016	0,261	50
	(a) Criterion (m)	N.É.	N.É.	N.É.	N.É.	N.É.	N.É.	N.É.	N.É.	N.É.	
	(b) Criterion area of influence (m)	N.É.	N.É.	N.É.	N.É.	N.É.	N.É.	N.É.	N.É.	N.É.	
	(c) Criterion area of influence (m)	2	2	2	2	2	2	2	2	2	

86. Table 3: Changes in air pollution pressure on roads in the long term (expected increases) (2042)

Name of road		M35 motorway north	M35 motorway south	Highway 33	Route 354	Northern access About M35	BMW Boulevard North	BMW Boulevard East	BMW Boulevard West	BMW Boulevard South
CO	**Emission (mg/m*s)**	0,011	0,007	0,009	0,004	0,004	0,014	0,004	0,002	0,004
	Emission maximum (μg/m³)	5,146	3,435	1,320	0,540	1,842	2,021	0,584	0,692	0,568
	Change in area of influence [m]	0	0	0	0	0	0	0	0	0
CH	**Emission (mg/m*s)**	<0,001	<0,001	<0,001	<0,001	<0,001	0,001	<0,001	<0,001	<0,001
	Emission maximum (μg/m³)	0,131	0,103	0,021	0,010	0,158	0,172	0,050	0,056	0,049
	Change in area of influence [m]	0	0	0	0	0	0	0	0	0

NOx	**Emission (mg/m*s)**	0,010	0,008	0,005	0,003	0,009	0,030	0,009	0,004	0,009
Name of road		**M35 motorway north**	**M35 motorway south**	**Highway 33**	**Route 354**	**Northern access About M35**	**BMW Boulevard North**	**BMW Boulevard East**	**BMW Boulevard West**	**BMW Boulevard South**
	Emission maximum (μg/m³)	4,845	3,864	0,756	0,365	4,249	4,417	1,348	1,171	1,310
	Change in area of influence [m]	0	1	0	0	0	0	0	0	0
NO2	**Emission (mg/m*s)**	0,002	0,002	0,002	<0,001	0,002	0,006	0,002	0,001	0,002
	Emission maximum (μg/m³)	1,099	0,765	0,257	0,111	0,715	0,805	0,227	0,304	0,221
	Change in area of influence [m]	0	0	0	0	0	0	0	0	0
PM	**Emission (mg/m*s)**	<0,001	<0,001	<0,001	<0,001	<0,001	<0,001	<0,001	<0,001	<0,001
	Emission maximum (μg/m³)	0,019	0,015	<0,01	<0,01	0,017	0,018	<0,01	<0,01	<0,01
	Change in area of influence [m]	1	1	0	0	1	0	1	0	0

87. Table 3: Calculated immission concentrations in the nearest line of protection in the time horizon (2042)

Name of road		**M35 motorway north**	**M35 motorway south**	**Highway 33**	**Route 354**	**Northern access About M35**	**BMW Boulevard North**	**BMW Boulevard East**	**BMW Boulevard West**	**BMW Boulevard South**	**Health limit value**
CO	**Emission maximum (μg/m³)**	2,08	3,38	0,70	0,06	0,44	<0,01	0,02	<0,01	0,05	10000
CH	**Emission maximum (μg/m³)**	0,06	0,10	0,02	<0,01	0,04	<0,01	<0,01	<0,01	<0,01	500
NOx	**Emission maximum (μg/m³)**	2,38	3,82	0,63	0,05	1,46	<0,01	0,06	<0,01	0,18	200
NO2	**Emission maximum (μg/m³)**	0,55	0,90	0,17	0,01	0,15	<0,01	<0,01	<0,01	0,02	100
PM	**Emission maximum (μg/m³)**	0,01	0,02	<0,01	<0,01	<0,01	<0,01	<0,01	<0,01	<0,01	50

As can be seen from the modelling results, the immission concentrations calculated taking into account the prevailing wind direction for the road sections concerned result in NOx concentrations above the health limit value along the axis of the road for the sections of the M35 motorway and the Northern access road from the M35, but without a sustained human presence. For the other road sections, pollutant loads in excess of the limit value are not expected along the axis of the road. For the road sections under consideration, no loads above the limit value are expected for the nearest protected zones.

7.1.4. Effects during the winding-up period

Similar impacts to those described in chapter 7.1.2 are expected during the clean-up period for the construction period. Given that the purpose of this documentation is to obtain an environmental and standard environmental permit for the facility, the facility is unlikely to be remediated in the near future. In the longer term, and taking into account the relevant limit values under Regulation (EU) 2016/1628 of the European Parliament and of the Council, the actual exposure levels are expected to be lower than those presented for the construction period.

7.1.5. Delimitation of the area covered by point sources

The method of determining the impact area is regulated by Government Decree 306/2010 (XII.23.) on air protection. Article 2.§ 14. of the Regulation:

14. stationary point source area: the maximum area around the point source under consideration where the dispersion of the air pollutant emitted by the point source at maximum capacity utilisation is expected to cause a change in the ground-level air pollution in the vicinity of the point source under near-surface and high-altitude meteorological conditions, calculated over the reference period, below the axis of the plume

- (a) greater than 10% of the one-hour (24-hour for $_{PM10}$) limit value,
- b) greater than 20% of the load capacity
- c) greater than 80% of the one-hour (24-hour for $_{PM10}$) maximum value, or;
- (d) where an odour protection zone is defined, equal to or greater than the design guideline value larger

To estimate the impact distance, we need to determine the one-hour air pollution exposure of the area, which is obtained by subtracting the baseline air pollution values from the one-hour health limit value or design guideline value.

The air quality limit values of the modelled air pollutants are given on the basis of the Joint Decree 4/2011 (14.I.VM.) for the components we have investigated.

88. Table 1: Health limit value or design guideline value for emissions and background exposure and load [$^{\mu g/m3}$]

Material from	Threshold	Background load	Contact
CO	10 000	408	9 592
NOx	200	17	183
NO2	100	11,6	88,4
PM10	50	20	30
SO2	250	1	449

In defining the area of influence, maximum concentrations determined by taking into account the actual meteorological conditions were taken into account. Exceptions to this are the parameters $_{NOx}$, NO2, $_{PM10}$ and $_{SO2}$, for which the US EPA has found in its parallel modelling (validation) that the calculation method used gives values higher than the actual data. The 98th percentile for $_{NO2}$ and $_{NOx}$ and the 99th percentile for $_{PM10}$ and $_{SO2}$ are more representative of reality.

The summarised air quality protection impact areas resulting from the calculation carried out using the above method are shown in the table below.

89. Table 1: Scope of air pollutants emitted by the installation

Polluter Material from	Emission concentration [µg/m³]	To define the scope concentration [µg/m³]			Coverage [m]		
		Criteria			Criteria		
		A)	B)	C)	A)	B)	C)
Aluminium	16,086	5	10	1,8704	-	-	228
Graphite	2,87	5	10	1,48	-	-	553
Carboxymethyl cellulose	0,016	5	10	0,001632	-	-	195
Cobalt	0,033	0,01	0,02	0,0296	581	420	402
CO	132,01	1000	1918,4	105,61	-	-	495
Kitchen extraction	172,49	50	100	137,42	523	333	327
Dimethyl carbonate	158,8	30	60	126,4	809	239	217
Ethylene carbonate	78,79	30	60	62,4	244	210	210
Ethyl methyl carbonate	78,79	30	60	62,4	244	222	222
Vas*	0,378	5	10	0,3024	-	-	162
Hydrogen chloride	0,54	2	4	0,44	-	-	227
HF	0,46	2	4	0,37	-	-	245
Lithium*	0,052	0,1	0,2	0,0416	-	-	403
$LiPF_6$	8,08	2	4	6,464	502	228	206
Manganese	0,045	0,1	0,2	0,036	-	-	199
NMHC	3,01	50	100	2,408	-	-	160
NMP	16,25	10	20	13	216	-	205
NO_2	77,96	10	17,68	62,78	1085	561	241
NOX	87	20	36,6	69,6	554	460	238
Solid material*	18,71	5	6	14,97	521	496	423
PVDF	0,002	5	10	0,0016	-	-	197
Silicon	0,008	5	10	0,0064	-	-	190
Sulphur dioxide*	18,93	25	50	15,144	-	-	315
Vinyl carbonate**	0,66	0,5	1	0,531	-	-	49
Poliacrylic acid	8,03	1	2	6,42	2 218	592	199
Diethylene glycol	1,44	20	40	1,15	-	-	373

**24 hour limit*
***Annual limit*

For substances with no coverage under conditions A or B, the ambient concentration did not exceed 10% of the one-hour (24-hour for PM_{10}) air pollution limit value or 20% of the exposure limit value. In the case where neither the concentration determined under conditions A nor B exceeds the calculated maximum concentration, coverage under condition C (80% of the maximum value) is required.

Based on the modelling results, the highest air quality impact area for the facility is for polyacrylic acid. The maximum impact area for polyacrylic acid emissions is 2 218 m, with centroid EOV coordinates:

- EOV Y: 835835,6 m
- EOV X: 251378,9 m

A map of the air quality protection calculations and the impact areas are attached in Annexes 2.5 and 2.9. In the figures showing the circular impact area shown in Annex 2.5, the tip of the arrow in the circle indicates the maximum extent of the impact area (maximum distance in kilometres from the centre of gravity of the emission sources), while the actual air quality protection impact area is shown by the isovalue corresponding to this value, as shown in Annex 2.9.

Considering that modelling of some pollutants was carried out by Enviro-Expert Ltd. to assess the combined impact with the cooling towers, the impact areas defined in the relevant documentation were also taken into account in the determination of the aggregated air quality protection scope of the facility. Thus, the extent of the combined air quality protection coverage for the period of operation, as shown on the map in Annex 2.9 and described in the table below, takes into account the expected air quality protection effects of all the substances assessed. The maximum extent of the air quality protection zone from the site boundary by main and secondary endpoint is shown below:

90. Table 1: Extent of the air quality protection zone of the establishment from the site boundary by main and secondary end-use area

Directions to	The largest area of influence is the from property boundary [m]
North	1 033
North East	1 677
East	434
South East	746
South	563
South West	242
West	384
North West	186

7.1.6. Air quality protection zone of the installation

7.1.6.1. Direct coverage

The direct impact area is the air quality protection impact area during the construction and operation phases. The parcel numbers affected by the impact areas are as follows:

Direct scope during the implementation period:

Debrecen, outskirts:
0237/131, 0237/132, 0237/133, 0237/134, 0237/135, 0237/136, 0237/137, 0237/138, 0237/139, 237/140, 0237/141, 0237/142, 0237/143, 0237/194, 0237/196, 0237/198, 0237/200, 0237/202, 0237/204, 0237/206, 0237/225, 0237/227, 0237/229, 0237/231, 0237/251, 0237/312, 0237/316, 0237/332, 0237/333, 0237/334, 0237/335, 0237/336, 0237/337, 0237/338, 0237/339, 0237/340, 0237/341, 0237/342, 0237/343, 0237/344, 0237/345, 0237/346, 0237/347, 0237/348, 0237/349, 0237/350, 0237/351, 0237/352, 0237/353, 0237/354, 0237/355, 0237/3570237/358, 0237/369, 0237/370, 0237/371, 0237/372, 0237/373, 0237/377, 0237/388, 0237/389, 0237/391, 0237/393, 0237/395, 0237/396, 0237/397, 0237/398, 0237/399, 0237/400, 0237/402, 0237/403, 0237/405, 0237/406, 0237/407, 0237/408, 0237/410, 0237/412, 0237/413, 0237/414, 0237/415, 0254/10, 0254/175, 0254/176, 0254/177, 0254/178, 0254/225, 0254/226, 0254/4, 0254/6, 0254/7, 0254/8, 0254/9, 0256/2, 0257/4, 0257/7, 0259/113, 0259/133, 0259/134, 0259/135, 0259/136, 0259/137, 0259/138, 0259/139, 0259/140, 0259/141, 0259/142, 0259/143, 0259/144, 0259/145, 0259/146, 0259/147, 0259/148, 0259/149, 0259/150, 0259/151, 0259/152, 0259/153, 0259/154, 0259/155, 0259/156, 0259/157, 0259/158,

0259/159, 0259/160, 0259/161, 0259/162, 0259/163, 0259/164, 0259/165, 0259/166, 0259/168, 0259/170, 0259/20, 0259/21, 0259/22, 0259/23, 0259/24, 0259/25, 0259/26, 0259/49, 0259/50, 0259/51, 0259/79, 0259/80, 0259/81, 0259/82, 0259/83, 0259/84, 0259/85, 0259/86, 0259/87, 0259/88, 0260/1, 0260/39, 0260/40, 0272/116, 0272/117, 0272/120, 0272/130, 0272/34, 0272/35, 0272/37, 0272/40, 0272/48, 0272/49, 0272/50, 0272/51, 0272/52, 0272/55, 0272/56, 0272/57, 0272/58, 0272/59, 0272/60, 0272/61, 0272/62, 0272/63, 0272/64, 0287/1, 0287/2, 0287/3, 0287/4, 0287/5, 0287/6, 0287/7

The maximum air quality protection zone for the installation during the construction period is defined in 7.1.2.3 is given in chapter 3.1.1 by main and secondary sectors.

Direct area of influence during the period of operation:

Debrecen, outskirts:

0142/168, 0142/173, 0142/175, 0142/176, 0237/11, 0237/12, 0237/13, 0237/14, 0237/15, 0237/194, 0237/196, 0237/198, 0237/217, 0237/219, 0237/28, 0237/284, 0237/286, 0237/288, 0237/29, 0237/290, 0237/292, 0237/294, 0237/296, 0237/298, 0237/3, 0237/30, 0237/300, 0237/31, 0237/316, 0237/32, 0237/320, 0237/321, 0237/324, 0237/325, 0237/326, 0237/327, 0237/328, 0237/329, 0237/330, 0237/331, 0237/332, 0237/333, 0237/334, 0237/335, 0237/336, 0237/337, 0237/338, 0237/339, 0237/340, 0237/341, 0237/342, 0237/344, 0237/346, 0237/348, 0237/350, 0237/352, 0237/355, 0237/363, 0237/364, 0237/367, 0237/369, 0237/371, 0237/372, 0237/373, 0237/388, 0237/389, 0237/390, 0237/391, 0237/393, 0237/395, 0237/398, 0237/399, 0237/4, 0237/400, 0237/402, 0237/405, 0237/406, 0237/407, 0237/408, 0237/410, 0237/412, 0237/413, 0237/49, 0237/55, 0237/56, 0257/7, 0258/5, 0258/6, 0258/8, 0259/100, 0259/113, 0259/133, 0259/134, 0259/135, 0259/136, 0259/137, 0259/138, 0259/139, 0259/140, 0259/141, 0259/142, 0259/143, 0259/144, 0259/145, 0259/146, 0259/147, 0259/148, 0259/149, 0259/150, 0259/151, 0259/152, 0259/153, 0259/154, 0259/155, 0259/156, 0259/157, 0259/158, 0259/159, 0259/160, 0259/162, 0259/164, 0259/166, 0259/168, 0259/170, 0259/25, 0259/26, 0259/49, 0259/50, 0259/51, 0259/79, 0259/80, 0259/81, 0259/82, 0259/83, 0259/84, 0259/85, 0259/86, 0259/87, 0259/88, 0259/89, 0259/90, 0259/91, 0259/92, 0259/93, 0259/94, 0259/95, 0259/96, 0259/97, 0259/98, 0259/99, 0260/1, 0260/39, 0260/40, 0272/130, 0272/34, 0272/35, 0272/37, 0272/40, 0272/48, 0272/49, 0272/50, 0272/51, 0272/52, 0272/55, 0272/56, 0272/57, 0272/58, 0272/59, 0272/60, 0272/61, 0272/62, 0272/63, 0272/64, 0287/2, 0287/3

The maximum air quality protection coverage of the installation for the period of operation is given in chapter 7.1.5 for each main and secondary endpoint.

In relation to the traffic impacts, as described in sections 7.1.2.4 and 7.1.3.7, the calculated increment in the calculated impact area of the access roads planned to be used for traffic flow is a maximum of 1 metre in total.

7.1.6.2. Indirect coverage

From an air quality protection perspective, the development of an indirect impact area (the area of propagation of impact processes due to changes in environmental conditions in the direct impact areas) can be interpreted as a spillover effect on another environmental element. This is the area potentially affected by soil pollution caused by the deposition or leaching of air pollutants. It should be stressed here that the air protection limit values are orders of magnitude lower than the soil protection limit values.

The soil protection scope is described in detail in chapter 7.3.5.

7.1.7. Examination of cumulative impacts

Based on data provided by the competent environmental authority:

- Based on the BMW Environmental Impact Assessment:
    - during construction, the air quality protection zone is set at 200 metres around the source of air pollution and at a maximum of 50 metres for traffic along the affected road sections.
    - During the operational period, the minimum extent of the area of influence is 1640 metres (in a north-easterly direction) and the maximum is 2470 metres (in a south-westerly direction).
- On the basis of the BMW Single Environmental Permit:
    - the area of influence extends at the furthest point from the virtual point of emission to 560 m in a northerly direction and 236 m in a southerly direction. The extent of the footprint is determined by NO_x and VOC emissions. In both cases, the legal criterion (c) was taken into account. The concentrations for criterion (c) were 19.2 µg/m^3 and 7.84 µg/m^3 respectively. The zones of influence did not extend beyond the site boundary of the facility.
- For the premises of Panattoni Hungary Development Kft:
    - the area of influence during the construction period is defined as 225 metres from the centre of the source.
    - installation of air pollution control sources that are operational during the period of operation not planned.
- Based on the preliminary investigation procedure for the logistics centre planned to be built in the Debrecen North-West Economic Belt (Licensee: IGPark DN Ingatlanfejlesztő Kft.):
    - the proposed development will have an air quality protection zone during the construction period, which extends 68 m from the site boundary of the development site and will not affect residential areas.
    - installation of air pollution control sources that are operational during the period of operation not planned.
- No information is available on the environmental impacts of other facilities planned to be located in the Debrecen North-West Economic Belt, so it was not possible to take them into account.

In view of the above, the cumulative effects of NO_x and VOC pollutants cannot be excluded in connection with the operation of the BMW plant, however, given that the air quality protection zone of the BMW Manufacturing Hungary Kft. site does not extend beyond the site boundary, the residential no significant cumulative effects are expected in the areas concerned. It should be stressed that it is not possible to quantify the cumulative impact without knowing the exact calculation results. With regard to the period of construction, assuming that the given impact area has been defined in relation to the phase of construction with the highest machinery demand, earthworks, no significant cumulative impacts are likely to occur.

The scope of the Panattoni Hungary Development Kft. construction also overlaps with the planned development of Eve Power Hungary Kft., but the construction activity with the largest scope has already ended, so the cumulative effect is not meaningful.

For the logistics centre mentioned above, the areas of influence overlap, but the increase of ~4.7 µg/m^3 for $_{NO2}$ for the nearest point of protection does not together cause an exceedance of the health limit value.

No information is available on the environmental impacts of other facilities planned for the Debrecen North-West Economic Belt, so it was not possible to take them into account.

7.1.8. Application for a permit to establish point sources in accordance with Annex 5 to Government Decree 306/2010 (XII. 23.)

7.1.8.1. Site characteristics of the installation or technology

The immediate surroundings of the installation are described in Chapter 5.1.

The climatic conditions of the planning area are described in Chapter 5.3.

Information on the baseline condition of the planning area environment is provided in Chapter 5.4.

7.1.8.2. Site plan with air pollution sources indicated

It is attached in Annex 2.6 of the documentation.

7.1.8.3. Description of the proposed activity, description of the technology used for the building, structure, sources of air pollution

A description of the buildings and technological areas to be constructed in the facility is given in chapter 3.2 located in. A detailed description of the proposed technology is given in Chapter 4.

7.1.8.4. Quality and quantity of raw materials, auxiliary materials and other additives and energy carriers used in the installation or technology

The quantities of chemicals and raw materials expected to be used on an annual basis, including wastewater treatment and the chemicals to be used in water treatment are given in Table 3.

The annual water use and energy requirements of the process are given in chapter 3.1.2.

7.1.8.5. Quality characteristics and quantitative data of the energy and finished products produced by the installation or technology

Based on the current plans, a 13.2 MW solar farm is planned to be installed in the planning area, capable of generating ~13 445.64 MWh of electricity per year. The electricity generated is planned to be used in the technology, no electricity is planned to be fed back to the grid.

The facility is planned to manufacture lithium-nickel-cobalt-manganese-based batteries for use in the neighbouring BMW electric car factory. The planned production capacity is given in section 3.1.2.

7.1.8.6. Sources of air pollution from the installation or technology

A detailed description of the air pollution control point sources to be installed at the facility is given in chapter 7.1.3.1. Information on the cooling towers considered as diffuse sources is provided in Section 7.1.3.5 and Section 1.6.

7.1.8.7. Expected emissions of the installation or technology into the elements, quantitative and qualitative characteristics of the emissions, significant effects on the environment

A detailed description of the environmental effects of the air pollution control sources planned to be installed at the facility is given in sections 7.1.3.1 and 7.1.3.5.

7.1.8.8. Technological processes and other technical solutions to prevent or, where this is not possible, reduce emissions

The technological description of the planned point source separation is described in chapter 7.1.3.1.

7.1.8.9. Where necessary, planned measures to prevent or reduce waste generation in the installation or technology

Efforts are made to reduce the amount of waste generated on the site. The contaminated water from the gas scrubbers, which are part of the separation technology, is discharged to the on-site wastewater treatment plant. The gas scrubbers will be supplied with recirculated treated water from the on-site treatment plant.

Preliminary plans are to transfer all waste generated at the facility to a recovery organisation. The highest volume of waste NMP will be transferred to a company that will produce industrial-grade NMP from industrial waste using distillation technology, so that the NMP can be reused on site.

To reduce the amount of waste going to disposal, especially for hazardous waste, the following techniques are used (not exclusively):

- transport of dangerous substances in containers to reduce the amount of packaging;

- Where , the use of reusable protective equipment (e.g. shoe protectors, work clothing, gloves, etc.)
- In the case of raw materials, a preference for reusable packaging towards manufacturers.
- Use of a QR code system to replace paper labelling for internal records and production tracking.
- Use of larger unit packs to reduce packaging waste
- Re-use, re-purposing:
  - preference for multi-pallet pallets
  - All waste except municipal waste is handed over to a recovery organisation.
  - Recycling is also supported by the planned on-site pre-treatment activities.

Ensuring disposal:

Only the transfer of municipal waste is planned for disposal, which will be provided as part of the public service or under an individual contract.

7.1.8.10. Additional measures to improve energy efficiency, safety and pollution prevention

No additional measures beyond those already planned, as described in chapter 7.1.8.8, need to be implemented.

7.1.8.11. Measures to ensure continuous monitoring of emissions

Given the minimum concentration and mass flow of pollutants, there is no need for continuous monitoring of emissions.

7.1.8.12. Demonstrate that the technology used, production process is in line with the best available techniques

For the proposed installation, the planned exhaust systems have been designed minimise the impact of the installation on the air environment.

The technological elements covered by the BAT Decision comply with the relevant BAT requirements as set out in Chapter 8. The combustion plants, although not covered by COMMISSION Implementing Decision (EU) 2017/1442, have emission characteristics below the relevant limit values. The combustion plants are high efficiency plants using $_{\text{Low-NOx}}$ technology.

High-efficiency capture systems are planned for the point sources to be installed in order to minimise emissions. No BAT decision or BAT reference documents have been issued for the elements of the planned technology not mentioned above, but based on the information provided by the Permittee and the Designer, the planned point sources and associated capture systems have been designed and selected taking into account the best available techniques.

7.1.8.13. Delimitation of the area of application

The calculated air quality protection scope of the installation is described in chapter 7.1.5.

7.1.8.14. An easy-to-understand summary

Eve Power Hungary Kft. (hereinafter referred to as the "Licensee") is planning to establish a new battery cell manufacturing site
the Debrecen hrsz. 0237/405, located along the BMW Boulevard.

The site is located Debrecen, in the North-Western Economic Belt.

The installation of 3 to 3 natural gas boilers is planned to supply the steam boilers and the thermal oil system. Where necessary, point sources connected to the technology equipment for direct extraction are planned. The extraction of any room or part of a room where any release of chemicals is expected will also be routed to the point of discharge.
The limit values for the air pollution abatement technologies under consideration are based on the legal requirements applicable to the technology in question.

The impact of the air pollution point sources to be installed in the area was modelled using the Aermod View 12.0.0 software. Based on the results of the calculations performed using data provided by the Permittee and the Designer, the predicted exposures are below the health limits and the design guideline values.
The anticipated odour load associated with the P50 point source, based on the assessment carried out on the basis of the data provided by the Permittee and the Designer, will not exceed the site boundary of the facility (calculated odour load less than 1 SZE/$m^{3)}$. The load of pollutants emitted will be below the concentrations that are reasonably likely to cause odour, based on the results of the calculation carried out on the basis of the data provided.

The maximum air quality protection coverage of the facility during the operational period, from the site boundary, by main and secondary endpoint, is shown below:

91. Table 1: Extent of the air quality protection zone of the establishment from the site boundary by main and secondary end-use area

Directions to	The largest area of influence is the from property boundary [m]
North	1 033
North East	1 677
East	434
South East	746
South	563
South West	242
West	384
North West	186

7.1.8.15. Licence number of the expert who prepared the documentation

The present documentation has been compiled on the basis of the data provided by the Investor, Eve Power Hungary Kft. The Investor is responsible for the authenticity and accuracy of the data. The calculations and modelling presented in the documentation have been compiled on the basis of the current state of the design, and compliance with the relevant legislation has been established on the basis of this state of the design.

Main details of the expert responsible for the content of the documentation:

- **Name:** Tamás Nagy
- **Qualifications:** okl. Agricultural Engineer in Environmental Management
- **Eligibility:** Environmental expert (SZKV 1.1-1.4)
- **Chamber number:** MMK 16-0731

Documents proving eligibility are attached in Annex 1.1.

Key data from the expert who carried out the air quality assessment of cooling towers and air pollution sources emitting nickel, cobalt, iron, lithium and copper:

- **Name:** Sándor Barna
- **Qualifications:** okl. Agricultural engineer in environmental management, environmental technology
- **Eligibility:** Environmental expert (SZKV 1.1-1.4)
- **Chamber number:** MMK 09-1037

7.2. Surface water

7.2.1. Default state

As described in chapter 5.6.

7.2.2. Impacts during the implementation period

There are no surface water bodies in the planning area and its surrounding area of ~4 km. The construction will have no direct impact on surface water bodies. However, stormwater infiltration and runoff patterns in the construction area will be altered.

During construction, the removal and filling of the humus layer, associated earthworks and paving will change the infiltration runoff conditions in the area. Prior to the construction of larger paved areas, adequate drainage and retention of rainwater will also be required. For this purpose, the construction of 3 open drainage ditches with earth basins and reception tanks is planned for the construction period. These facilities will be used for the disposal of rainwater collected on the site. No off-site discharge is planned during this period. A temporary drainage has been constructed and connected via culverts to a siltation basin. These ditches were typically constructed adjacent to the pile-driven avalanche plane (~132.45 mBf).

The likelihood of surface water contamination may increase after the paved surfaces are constructed, when stormwater is collected and drained using the public sewer system. In this case, in order to avoid indirect contamination through the stormwater drainage system, it is recommended that, in addition to the above-mentioned remedial materials, we have in place a loop of softening material to protect the nearest drainage channel from contamination in the event of an accident.

During construction, water will be supplied by public water. Municipal waste water will be collected by mobile or installed tank toilets, and the contents will be regularly transported for disposal.

Care must be taken to prevent surface water and groundwater pollution in the area that could be attributed to havarias. This type of accident is the overturning of machinery or lorries, which can release hazardous substances (fuel, lubricants and hydraulic oils) into the environment. Major accidents to avoid contamination, the general equipment for remediation is available at the work site: a shovel and bucket, a suitable container for collecting contaminated soil and shovel material, and a shovel for collecting the shovel.

7.2.3. Effects during the period of operation

7.2.3.1. Water supply

The water supply and sewage drainage of the facility is provided by Debreceni Vízmű Zrt., while the drainage of rainwater is ensured by the Mayor's Office of Debrecen City, City Management Department. No surface water abstraction is planned.

The drinking water and process water demand for the planned activity is based on the available water balance (1.14 attached as annex) is as follows:

- drinking water demand: 4 m^3/h or 79m^3/day (26 070 m^3/year)
- industrial dilution water demand: 53.3 m^3/h or 585.11 m^3/day (193 086.3 m^3/year)
- industrial grey water demand: 160 m^3/h, 2981,78 m^3/day (984 060 m^3/year)

Three separate, independent internal water supply networks are planned to ensure the supply of municipal and process water.

In order to meet the extinguishing water demand outside and inside the building, the planning area is equipped with a separate
a fire water and sprinkler network will be installed. Based on data provided by the fire protection:

- water demand of the fire water network (6300 l/min):
    - external extinguishing water demand 6000 l/min
    - internal extinguishing water demand 300 l/min
- sprinkler system water demand 8000 l/min.

The demand for extinguishing water is supplied from the extinguishing water storage tanks located within the PS building, using booster pumps, and the industrial dilution water network is only required for filling and maintenance purposes.

Metering point design: inside the plot, 1 m from the fence, metering well installation and instrumentation according to specifications, designed according to service provider needs.

The total water demand for the proposed facility is shown in the table below.

92. Table 2: Maximum water demand of the planned installation when full capacity is reached

Type of water demand		**Water demand**
Municipal water demand	drinking water	4 m^3/h; 79m^3/day (26 070 m^3/year)
Technological water demand	industrial diluter	53.3 m^3/h; 582.11 m^3/day (193 086.3 m^3/year)
	industrial grey	160 m^3/h; 2981.78 m^3/day (984 060 m^3/year)

7.2.3.2. Sewage disposal

The public sewerage system is operated by Debreceni Vízmű Zrt. The acceptance declaration of Debreceni Vízmű Zrt. is given in Annex 1.10. **A separate system** for the on-site drainage of wastewater and stormwater will be established.

Within the planning area, a separate system will be set up for collection of urban waste water, process waste water, treated
process waste water, rainwater collected from roofs and rainwater collected from roads.

A municipal sewerage network will be built around the planned buildings, in accordance with the outlets defined in the building services plans. For the MU building, an external grease trap will be installed to match the kitchen technology.

The effluents from the technologies are discharged separately, according to their quality, to the treatment plant in the PS building. After treatment, the water will be partly reused in the closed system process (gas scrubber wash water) and partly discharged to the external public process wastewater discharge network within the planning area via the treated/process wastewater discharge network. The external network will be established by the DMJV.

Only wastewater of a municipal nature (not in contact with the technology) is discharged into the municipal wastewater network, in compliance with the provisions of Government Decree 28/2004 on the discharge and use of water pollutants.

Wastewater volumes in the project area based on the water balance:

- Urban waste water: 68.14 m^3/day
- Technological waste water: 1336,87 m^3/day
    - Of this, 225 m^3/day is generated in the treatment

plant Treatment of wastewater from the technology:

- is sent to the treatment plant in the PS building through a closed network and after treatment is either partially reused or discharged to the process industrial wastewater network
- collected in a storage container and then transferred to a third party authorised to handle the waste
- is collected in IBC containers and then transferred to a third party authorised to handle the waste

The on-site process industrial network for process wastewater is gravity and pressurised, and process industrial wastewater is connected to the pressurised public network via a pressurised branch.

Requirement for technological waste water pipelines to the treatment plant for untreated waste water:

- all underground process wastewater pipelines are considered as potentially contaminant-carrying pipelines, and only stainless (min. material grade 1.4404), min. The pipelines must be made of steel pipe with a wall thickness of series 3 according to DIN EN 10253-2, only welded in covered parts (seamless or longitudinally welded pipe only according to test class TC1), the pipelines must be subjected to a pressure test according to EN13480-5 before covering (minimum test pressure: min. 3 bar(g) or 1,47 times the design pressure); flanged or other pipe connections shall only be made in manholes (manholes shall be provided with a liquid-tight, chemical-resistant coating.

- all above-ground process wastewater pipelines are considered as potentially pollutant-carrying pipelines, and therefore only stainless (min. material grade 1.4301), min. The pipelines must be made of steel pipe with a wall thickness of series 3 according to DIN EN 10253-2, exclusively of welded design (seamless or longitudinally welded pipe only according to test class TC1), the pipelines must be subjected to pressure test for pressure resistance according to EN13480-5 before insulation (minimum test pressure: min. 3 bar(g) or 1,47 times the design pressure); mainly welded fittings to be used, flange joints only in the most necessary places, other joints (e.g. flange, camlock, etc.) should be avoided, cuffs to be used as spill protection at pipe joints in case of flange joints

Requirement for process wastewater pipelines downstream of the wastewater treatment plant for treated process industrial wastewater:

- all underground process wastewater pipelines are considered to be potential pollutant carrying pipelines, however, after the treatment plant, the network will carry treated process industrial wastewater, which, in accordance with the material of the receiving public sewer network, will be made of KPE PE100 material, class SDR11 pipe, with a minimum pressure rating of PN10, marked with the brown colour code as specified. The products to be installed shall comply with the technical requirements laid down in the product standards MSZ EN 12201 and MSZ EN 1555. The watertightness test of the completed manholes, structures, gravity pipelines shall be carried out in accordance with clause 1.4 of the standard MSZ EN 1610:2001, in accordance with the standard MSZ EN 805:2000. Pressurised pipelines shall be subjected to a pressure test with a test pressure of one and a half times the working pressure + 1,0 bar. The material quality of the gravity network shall be PVC-U, the manholes shall be prefabricated reinforced concrete manholes, chemically resistant, with a continuous liquid-tight coating.

Industrial wastewater treatment plant:

As part of the technology, an on-site wastewater treatment plant will be set up to treat anode (negative "B") and cathode (positive "A") effluents with high organic matter and nitrogen concentrations in a separated system. In addition, a third type of wastewater fewer pollutants, from condensate and wash waters ("C"), will be treated here. A detailed water flow diagram (water balance) is given in Annex 1.14. The planned volume of process effluent discharged to the WWTP is given in the table below.

93. Table 1: Wastewater volumes

	Wastewater "A" (cathode)	"B" waste water (anode)	"C" waste water
Daily volume of waste water (m^3/day)	22,5	147,3	55,2
Órafactor (hours)	15	20	9
Volume of waste water (m^3/hour)	1,5	7,4	6,1

The total daily volume of wastewater discharged to the treatment plant is **225 m^3**.

On the basis of the data provided by the designers, the technological effluent discharge limit values according to point 33 of Annex 2, No.2 of the Decree No.28/2004 (XII. 25.) are not justified. In view of the above, the quality of the pre-treated wastewater discharged from the site must comply with the limits for the discharge of process wastewater into the sewer, which are presented in the table below based on the declaration of the receiving body, Debreceni Vízmű Zrt. The declaration of principle by the recipient is given in Annex 1.12.

94. Table 1: Waste water emission limit values

#	Parameter name	Unit of measurement	Emission limit concentration*
1	KOICr	mg/l	400
2	BOI5	mg/l	190
3	BOI5/KOICr min	%	40
4	Total inorganic Nitrogen	mg/l	31
5	Total N	mg/l	36
6	Total P	mg/l	6,0
7	Total suspended solids	mg/l	150
8	Total dry matter	mg/l	1 600
9	Total salt	mg/l	1 400
10	Na e%	%	45
11	Organic solvent extract	mg/l	5
12	Organic solvent	-	-
13	mineral oil	mg/l	0,01
14	TPH	mg/l	0,02
15	Benzene	mg/l	0,0005
16	Toluene	mg/l	0,0005
17	Ethylbenzene	mg/l	0,0005
18	Xilolok	mg/l	0,001
19	Total other alkylbenzenes	mg/l	0,001
20	PAH	mg/l	0,00001
21	NMP(N-methyl-2-pyrrolidone)	mg/l	1***
22	ethyl methyl carbonate	mg/l	1***
23	2-amino-2-metil-1-propanol	mg/l	0,0
24	AOX	mg/l	<0,1
25	dichloromethane (methylene chloride)	mg/l	0,00001
26	Sulphides	mg/l	0,5
27	Fluoridoc	mg/l	2,0
28	Phenols (phenol index)	mg/l	0,04
29	Ag	mg/l	0,01
30	Al	mg/l	1,0
31	B	mg/l	0,5
32	Be	mg/l	0,00001
33	Hg	mg/l	0,001
34	Cd	mg/l	0,005
35	Cu	mg/l	0,2
36	Ni	mg/l	0,07*
37	Pb	mg/l	0,01
38	Cr total	mg/l	0,05
39	Cr VI	mg/l	0,01
40	Co	mg/l	0,02
41	Li	mg/l	<0,1**
42	Mon	mg/l	0,02
43	Se	mg/l	0,01
44	Zn	mg/l	0,2
45	Sb	mg/l	0,01

46	Sn	mg/l	0,01
#	**Parameter name**	**Unit of measurement**	**Emission limit concentration***
47	Mn	mg/l	1,0
48	Ba	mg/l	0,3
49	Fe	mg/l	10,0
50	As	mg/l	0,01
51	Tl	mg/l	0,000005
52	V	mg/l	0,00001
53	dimethyl carbonate (DMC)	mg/l	1***
54	chlorinated aliphatic hydrocarbons	mg/l	0,00003
55	Cyanide, easily released	mg/l	0,05
56	Cyanide	mg/l	0,1
57	Toxicity (fish)	-	0,0
58	pH	-	> 6.5
59	pH	-	< 8.5
60	Temperature (min-max)	°C	12-25

**If the Authority imposes a more stringent limit than the one set out in the table by the Territorial Water Operator, the Discharger shall be obliged to apply it.*
*** The concentration of lithium in the grey water used must not exceed the concentration measured in the discharged pre-treated process (industrial) waste water.*
****Designed concentration <0.1 mg/l for NMP, no release designed for ethyl methyl carbonate and dimethyl carbonate (concentration 0.0 mg/l)*

According to the relevant tables in Chapter 4, some of the substances intended to be used in the technology may be present in the process wastewater sewer system and thus enter the wastewater treatment plant. Based on design data, the components of these substances will be completely separated by the multi-stage treatment technology. Exceptions to this are NMP, nickel, cobalt, manganese and lithium, for which the limits in Table 93 will be respected. Since all these substances are listed in the detailed list of limit values issued by Debreceni Vízmű Zrt. and referred to above, it is not necessary to specify any further substances.

The wastewater treatment plant will not pollute the environment or release pollutants into the environment during normal operation. To check this, among other things, the quality of the effluent discharged at the outlets must be monitored on a monthly basis. Only municipal waste water and process waste water treated to the appropriate limits is discharged from the site.

In order to prevent pollution resulting from non-operational operation, accident
an equalisation basin and a havaria basin are planned for the wastewater treatment system.

The equalisation basin, which can receive varying quantities and qualities of process wastewater, ensures the homogeneity of the wastewater sent for further treatment in terms of organic load, nutrient content and pH. Under normal conditions, cathode effluent is fed into the cathode equalisation basin via a separate pressurised pipeline, and anode branch effluent is fed into the anode equalisation basin. The raw sewage piping will have a flow meter. Both basins are capable of storing a full day's volume of wastewater, i.e. the Cathode equalisation basin is 34 m^3 and the Anode equalisation basin is 225 $m^{(3).}$ The basins are covered, made of reinforced concrete, equipped with level switches and level gauges.

Each equalisation basin is equipped with a havaria basin to help protect the treatment technology, especially during periods when the system would be subject to extremely high loads. The havaria basin, together with the equalisation basin, allows for the storage of larger volumes of wastewater in the event of a breakdown. The volume of the havaria basins is equal to the volume of the associated equalisation basin (34 m^3 on the cathode branch and 225 m^3 on the anode branch). The havaria basins are covered, made of liquid-tight, chemically resistant reinforced concrete with a double-wall coating, equipped with level switches and level transmitters, and fitted with a leak detection mini-tracking system.

The equalisation and havaria basins are equipped with a common overflow, which ensures that wastewater from one basin can flow into the other at high basin levels.

In addition, the wastewater treatment room will have waterproof and chemically resistant flooring, and HDPE sheeting will be installed under the wastewater treatment room. The concrete basins will be with a water-tight, liquid-tight, chemically resistant coating and the tanks will be made of chemically resistant material. The room will be fitted with a baffle in front of the doors to prevent spillage into neighbouring rooms.

7.2.3.3. Stormwater drainage

Based on the statement of principle of the Mayor's Office of the City of Debrecen, City Management Department, the drainage ditch is constructed on the southern border of the planning area, on the northern section of BMW Boulevard, the parcel 0237/395, within the framework of another project, and the final recipient of the stormwater is the Látóképi reservoir marked L- 1.

For the latter:

- Owner: Hungarian State
- Trustee: Tiszántúli Water Management Directorate
- Operator: Tiszamenti Regionális vízművek Zrt.

Maximum peak simultaneous discharge of rainwater from the site: 1250 l/s; split between two discharge points. A Pureco ENVIA TNP type petroleum interceptor will be installed and operated under continuous monitoring at the design site.

The averaged (five measurement points) area specific rainfall rate for the calculation of the rainfall load is 264 litres/sec/ha in the Debrecen area. According to the architect's plans, rainwater is drained off-site through gravity drains. According to the utility plans, stormwater run-off will be discharged outside the building in a closed channel.

Based on the rainfall runoff calculation for the planning area, the design rainfall runoff for the area is 4997 l/s (see section 4.6.2.2), of which 1643 l/s is rainfall falling on paved surfaces (potentially contaminated with oil) and 3354 l/s is "clean" rainfall falling on roof surfaces.

Two separate stormwater networks are planned for the planning area as described above:

- a 'clean' stormwater drainage network for the proposed buildings, based on the building services discharge and outfall points;
- a "potentially oil-contaminated" stormwater drainage network for stormwater runoff from proposed roads and outdoor parking areas, based on the sinkholes and swales depicted on the road construction plans.

The simultaneous discharge of stormwater from the project area is 1250 l/s. The difference between the volume of stormwater that collects within the site and the volume of stormwater that can be discharged from the site at the same time shall be temporarily stored in a reservoir within the site to delay the release of stormwater. The sizing procedures and parameters are based on the Government Decree 147/2010 and the design practices adopted by the Contracting Authorities and Managing Authorities in recent years, taking into account the expected effects of climate change. On this basis, a rainfall retention of 10 minutes intensity with a probability of occurrence of 5 years is planned. The duration of the retention was set at 30 minutes. On this basis, the construction of a reservoir of approximately 7000 m(3) of usable volume is required, which is planned to be partly under the parking area in the southern part of the site and partly under the green area in the south-eastern part of the site. The reservoirs are planned to be constructed with Pureco type tubular steel in-line reservoirs or equivalent technical solutions.
The water drained through the "potentially oil-contaminated" stormwater drainage network will be discharged through oil interceptors to "clean" stormwater drains and to stormwater detention ponds within the proposed site.

The discharge of rainwater into the catchment is subject to compliance with the required quality parameters. The City Management Department of the Mayor's Office of the City of Debrecen has not defined specific limit values in the declarations of principle of the stormwater in the stormwater inlet with the registration numbers ÜZEM-340201-3/2023 and ÜZEM 201609-2/2024, so the discharge limit value is determined by the general provisions of the Decree 28/2004 (XII. 25.) KvVM. The stormwater is discharged directly into the stormwater drainage ditch of the northern section of the BMW, the final destination of which is visual reservoir L-1. The "Látóképi" reservoir is defined in the Decree 28/2004 (XII. 25.) KvVM
is considered a host with general protection within the meaning of Annex 2 to this
category apply.

The quality of stormwater run-off from an oil-contaminated stormwater drainage system can be ensured by the use of pre-treatment equipment. The pre-treatment equipment envisaged is a commercially available, CE-approved Pureco ENVIA TNP type or technically equivalent other sludge and oil trap.

During the period of operation, the stormwater run-off will affect the water balance of the receiving surface water body of the L-I reservoir. After the project is completed, it is expected that the additional stormwater run-off will temporarily increase the water level of the pond concerned, resulting in a more uneven water supply (periodically higher water volumes). Although the surface water body concerned, an artificial lake used as a fishing lake, is currently used for reservoir purposes, the impact of the project (fluctuating water levels) may affect the existing biota and ecosystem of the lake.

7.2.3.4. Assessment of status under VGT

The VGT assessment of the water body indirectly affected by the project, the L-I standing water (Sight Reservoir), is presented in Section 5.6
is presented in chapter.

Assessment of the Visitor Reservoir under the VGT:

- the status of biological elements is moderate;
- physico-chemical elements are excellent;
- based on hydromorphological elements

    - morphological quality is good;
    - poor on the basis of permeability;
    - moderate in terms of hydrology;
- specific pollutants are good;
- ecological status is moderate;
- chemical condition is good (2).

The overall assessment of the water body is moderate (3). The integrated status assessment is determined by biological, ecological and hydromorphological status.

The improvement of the status of the water body and the proposed measures will not be directly affected by the clean or potentially pollutable but pre-filtered stormwater discharged by the project through detention and volume limitation.

The ecological status can be indirectly modified by the inflow of clean water through water level fluctuations. The effects of this should assessed after the start of operations , if the lake ecosystem is altered by the discharge due to changes in rainfall intensity and annual rainfall distribution, the timing and timing of the discharge should be reviewed.

The physico-chemical status of the water body is excellent, the proposed measures are aimed at agricultural practices and inputs and soil erosion reduction around the water body, and do not conflict with indirect inputs of treated stormwater.

The morphology of the water body will not be affected by the introduction and, in the absence of nature conservation protection, its aspects will not be affected or harmed.

7.2.4. Effects during the winding-up period

With the cessation of the activity, impacts on surface water will cease. Reduced hydraulic loading of receptors and the cessation of wastewater generation and discharge of treated wastewater are expected.

The L-I Sight reservoir is expected to experience repeated changes in the water balance of the surface water body, which may lead to a repeated upsetting of the new "equilibrium state" expected to have been established/established in the ecosystem during operation. With the loss of surplus rainwater recharge, the water level rise of the lake after rainfall could be reduced and its nutrient supply altered, causing temporary environmental stress. With the cessation of surplus rainfall recharge, an equilibrium will be restored over time, which may be similar to the pre-investment situation.

7.2.5. Delimitation of the area covered

Impacts on surface water are related to changes in the way stormwater runoff is managed. It affects the area affected by the construction of paved surfaces and the point collection of rainfall and altered run-off conditions. The direct (and indirect) area of influence on surface water may be the stormwater drainage system receptor (the Visible Water Reservoir) and drainage track facility from the project site to the receptor.

Wastewater is discharged to a public sewer and therefore the direct impact on surface water from the facility is negligible. No direct or indirect impact area can be interpreted for the discharge of effluent to public sewers during normal operation.

7.3. Groundwater and geological medium

7.3.1. Default state

The baseline condition of the site is described in detail in Chapter 5.5 and in the baseline report attached in Annex 1.8.

7.3.2. Impacts during the implementation period

The direct impact of the construction on the geological medium and soil is due to the preparatory soil work and the earthworks and landscaping carried out during the construction, which in certain areas involved the deposition of humus. These activities have been carried out in accordance with the building permit for excavation and piling activities, as described in Chapter 0, which was requested on the basis of a preliminary assessment carried out earlier.

Construction equipment and trucks used during construction cause soil compaction on access roads and work areas, which can also be interpreted as a direct impact on the geological medium.

A hazard event is assumed to be the failure of machinery and trucks. In such cases, hydraulic oil or fuel contamination of soil and groundwater is possible. In order to prevent environmental pollution, it is necessary to start immediately the elimination of the source of contamination, troubleshooting, contaminant recovery, removal and replacement of contaminated soil. It is also important that the maintenance of machinery is carried out regularly off-site by a specialist workshop. The refuelling of machinery and the maintenance and refilling of the hydraulic system should not be carried out in the field.

In order to prevent the contamination of groundwater and the geological medium, it is necessary to properly store and collect the waste generated during the construction works and to hand it over to an authorised disposal company.

In order to meet social needs, mobile toilets or temporary containers will be installed to collect waste water.

7.3.3. Impacts during the operational period

Under normal operating conditions, the likelihood of groundwater and geological contamination during the operation of the facility is very low due to the remediation techniques used.

The piping system for the **cathode and anode slurry** production will be equipped with enhanced safety seals (spiral seals) to prevent leaks. At the sampling points, a damage tray is used for sampling, and sampling is carried out in a closed system. Leakage protection cuffs are installed at joints that are frequently released. Safety systems are provided to minimise the risk of accidental spillage from the system.

The anode and cathode suspension produced as a result of the technological process is transferred to the coating production line through a closed system. During the production process, no chemical reaction place, no new material is generated, only physical mixing takes place, so no new pollutant is generated during the technological process. The tanks and filters are cleaned with purified water, and the effluent from the cleaning process is piped to the plant's wastewater treatment plant. The quality control of the resulting suspensions is carried out in laboratories inside the building, and the effluent from the laboratories is also sent to the plant's wastewater treatment plant in the PS building via a closed pipeline system. The ventilation air from the laboratories and washrooms is discharged to point sources P3 and P4 after two-stage activated carbon separation.

The cathode (A) and anode (B) effluents are treated separately at the beginning of the process, as they contain different pollutants. An arch strainer is placed at the inlet to receive the incoming effluent, which is a mechanical safety filter. Under normal conditions, cathode effluent is fed into the cathode equalisation basin through a separate pressurised pipe and anode branch effluent is fed into the anode equalisation basin. Both equalization basins include a havaria basin to help protect the wastewater treatment technology, especially during periods when the system would be subject to extremely high loads . Together with the equalisation basin, it allows for the storage of larger volumes of wastewater, which is particularly beneficial in the event of a breakdown. The volume of the havaria basins is the same as the volume of the corresponding equalisation basin (34 m^3 on the cathode branch and 225 m^3 on the anode branch). The havaria basins are covered, made of liquid-tight, chemically resistant, reinforced concrete with a double-wall coating with a leak detection minitoring system, equipped with level switches and level transmitters. The proposed layering scheme to be applied under the WWTP is described in detail in Section 4.14.1.1 and Annex 2.3.

Hazardous substances used during assembly and moulding (electrolyte, rust inhibitor, marking ink) are contained in a spillage containment tray, any spillage is soaked up from the containment tray and stored as hazardous waste in the DW building.

The **NMP tank farm** will be used for the storage of new NMP to serve the technology and for the storage of contaminated NMP to be recovered from the process system. Both the tanks for new NMP storage and the tanks for contaminated NMP storage will be located within a building with a damage containment. Storage of new NMP will be in 2 75 m^3 above ground, horizontal cylindrical, hazardous liquid storage tanks. The contaminated NMP will also be stored in 2 75 m^3 above ground horizontal cylindrical hazardous liquid storage tanks. The tanks will be inerted with nitrogen and equipped with all the necessary instrumentation and equipment for safe operation. The tanks are of stainless steel construction, designed according to the specifications of standard MSZ EN 12285-2. The evaporated NMP condensed and pumped first to buffer storage tanks (2 5 m^3 upright cylindrical tanks) within the EL building and from there to the contaminated NMP hazardous liquid storage tanks located in the NMP tank farm. The contaminated NMP is transported off-site by ISO road tanker. The new NMP is delivered to the site by road. During delivery, the transport vehicle drives to the discharge station where the new NMP is pumped into one of the new NMP storage tanks. During the offloading process, the storage tank used for offloading and the ISO tanker are connected by a gas shuttle to prevent the release of NMP contamination into the environment. The transfer of NMP to the buffer tanks inside the building is also carried out by pumps. The internal buffer tanks are connected to the external storage tanks by a gas fence, so that no NMP is released to the environment during the transfer operation. Since the storage tanks are designed with a gas fence system, NMP emissions are not expected operationally. Hazardous liquid storage tanks will be located within a containment building, adjacent to which will be the discharge area. A steel frame roof structure will be constructed over the entire discharge area to minimise the amount of stormwater entering the areas. The stormwater run-off and, in the event of a disaster, the contaminated liquid from both the remediation and the discharge areas will be discharged into a 40 m^3 underground sludge tank to be located in the area. The discharge area is connected to the slop tank by a gravity underground pipeline, so that the area is automatically drained without external intervention. The underground pipeline is a double-walled, stainless steel pipeline, with the interspace filled with glycol and equipped with a leak detection system to prevent soil contamination. The 40 m^3 slop tank is located in the southern part of the remediation. The tank double-walled and equipped with a leak detection instrument according to MSZ 9910-3 .3.7, so that it is installed without a containment area. The interstitial space of the slop tank will be filled with antifreeze and a leak detector will be installed to monitor the double wall and alert the operator in case of a leak. The maximum filling level of the slop tank is 20 m^3, ensuring that it can hold a tanker truck's worth of liquid at any time. The slop tank can be unloaded with an ISO tanker or transferred to the contaminated storage tank. The discharge area is provided with a chemically resistant, liquid-tight enclosure. The interior surfaces of the containment wall and flooring will be of a watertight design and resistant to the chemical properties of the stored material (NMP). HDPE sheeting will be installed under the entire containment and containment area, bonded to the monitoring well. Along the perimeter of the discharge area, a river will be constructed and discharged into a sump, from which any contaminated liquid will be gravity drained to the slop tank via an underground double-walled stainless steel pipe as described above. The building's containment area, as a containment area, will be designed to meet the capacity requirements of MSZ 9910-2. One emergency shower will be installed in the discharge area, one each in the north and south of the discharge area. The NMP gas scrubber its own damage tray, so the building does not have its own damage tray.

The Electrolyte Tank Farm is where the electrolytes used as feedstock are stored. Four 50 m^3 above ground pressure vessels and two 25 m^3 above ground pressure vessels will be installed to store the electrolyte. The six pressure vessels will be located within a single room, the room itself serving as a damage containment. The pressure vessels will be located within the building in a damage control room. The containment capacity of the containment space (building damage control) is in accordance with the relevant MSZ 9910-2 standard. A steel-framed roof structure will be constructed over the drainage area to minimise the amount of stormwater entering the areas. The stormwater run-off and, in the event of a disaster, the contaminated liquid from both the remediation and the discharge areas will be discharged into a 40 m^3 underground sludge tank. The discharge area will be connected to the slop tank by a gravity underground pipeline, while the remediation area will be connected to the 40 m^3 underground slop tank by transfer pumps. The underground pipeline will be a double-walled stainless steel pipeline with a glycol and leak detection system in the intermediate space, so that no soil contamination can occur. The 40 m^3 slop tank is located in the northern part of the tank area. The tank is double-walled and equipped with a leak detection instrument according to MSZ 9910-3 3.3.7, and is therefore located without a containment area. The interstitial space of the slop tank will be filled with antifreeze and a leak detector will be installed to monitor the double wall and alert the operator in case of a leak. The breather line for the septic tank will be connected to the AC tower system in the area. The maximum filling capacity of the slop tank is 40 m^3, guaranteeing that it can hold a tanker truck load of liquid at any time. The slop tank can be unloaded by ISO tanker. A single emergency shower is provided in the discharge area. The internal surfaces of the walls and floors of the damage containment will be waterproof and designed to withstand the chemical properties of the stored material (Electrolyte). The entire

HDPE film tied to a monitoring well will be installed under the building and discharge area. Along the perimeter of the discharge area, a river will be constructed and discharged into a sump, from where any contaminated liquid will be gravity drained to the sludge tank via an underground double-walled stainless steel pipe as described above. The discharge area is covered with a chemically resistant, liquid-tight, non-sparking casing.

The hot oil requirements of the anode and cathode side drying furnaces, as the heat transfer media, are provided by three hot oil boilers installed in the boiler house. Underneath the tanks, a baffle will be installed to prevent the risk of soil contamination in the event of a disaster.

HDPE film tied to a monitoring manhole will be placed under the **hazardous waste (DW) building.** Liquid waste will be stored in the room only in a damage containment tray. The floor of the room is of a non-sparking, liquid-tight and chemical-resistant design.

HDPE film is installed under the **anode foil treatment building (BD)**, the floor is chemical resistant, non-sparking and liquid tight.

Under the **battery testing building (BS)**, HDPE film tied to a monitoring manhole will be placed under the battery dismantling room group. Liquid waste will be stored in the room in a damage containment tray only. The floor of the room is of a non-sparking, liquid-tight and chemical-resistant design.

However, the formation of havarias and possible groundwater pollution should be expected in the above-mentioned even with mitigation technologies and measures.

Hazards are assumed to be the overturning of trucks, cracking or breaking of the pavement, or the release of materials or waste intended for use or storage pending use in the facility.

In the event of an accident, there is the potential for spills of hydraulic oil or fuel, or chemicals used in the facility, into soil and groundwater. In such a case, in order to prevent environmental pollution, the source of the contamination must be eliminated, the fault rectified, the contaminant digested, the contaminated soil removed or replaced without delay.

Major failures of the pavements are visually detectable, so major pollution is unlikely to occur in this way. However, it should be stressed that small concentrations of contamination may be deposited in the microcracks of the pavement, and continuous monitoring of the pavement condition is therefore necessary. The collection points for hazardous materials used in the facility and for hazardous waste stored on site until removal will be equipped with appropriate technical protection to prevent pollution from spills in the event of an accident.

The Permittee shall comply with the requirements detailed in Section 7.4.2 for the waste workplace collection point to prevent the release of contaminants to groundwater and geological media.

In order to minimise the effects of damage during loading, the general equipment for damage control (sand or other filling material, storage container, etc.) should be kept ready at all times in areas with this function.

Particular care should be taken to ensure that stormwater treatment equipment (oil traps) is maintained at regular intervals, as there is a risk of accidents if it is not properly maintained.

In order to ensure timely and effective damage control, the general equipment for damage control should be available at several locations in the establishment. In the event of an emergency, the competent authorities must be notified in accordance with the provisions of Government Decree 90/2007 (IV.26) and Act LIII of 1995. The fire brigade of the establishment mentioned in chapter 4.4.6 can play an important role in the damage control and in the prevention of environmental pollution, as its availability will significantly reduce the response time.

Unlike previous land use, the extent of buildings and paved surfaces will increase, changing runoff and infiltration patterns, but at a regional scale the impact is negligible. According to a declaration of principle by the Mayor's Office of the City of Debrecen, Urban Management Department, the drainage ditch will be constructed on the southern boundary of the planning area, on parcel 0237/395, as part of another project, and its final destination will be the L-1 or Látóképi reservoir. Due to the limited volume of stormwater discharged (1250 l/s), it is expected that the stormwater will be stored and the release delayed. The planned stormwater drainage network is described in detail in section 4.6.2.2.

Water discharged through the 'potentially oil-contaminated' stormwater drainage network can only be discharged through oil interceptors into 'clean' stormwater drains or into on-site stormwater detention ponds within the proposed site, so that groundwater and contamination can be excluded under normal operation.

Groundwater must be monitored every 5 years pursuant to Article 22 (10) of Government Decree 314/2005 (XII. 25.). However, if the competent water protection and environmental protection authority deems it necessary and justified in connection with the use of the groundwater, it may require more frequent inspections.

The impact of the proposed facility on groundwater and geological media is negligible, provided that appropriate technical discipline is applied and the measures summarised above are implemented.

7.3.4. Effects during the winding-up period

During remediation (if restoration to baseline is), impacts during the construction period are expected to be similar to those described in chapter 7.3.2.

There are no plans to close down the facility or cease operations in the near future. Future planned remediation will include the demolition of buildings and pavement, utilities and other underground infrastructure. The demolition is expected to generate a large amount of inert and/or recoverable demolition waste, the majority of which is expected to be recoverable.

In order to avoid groundwater and media contamination, the affected equipment, sewer or pipeline sections shall be drained and the affected pipelines disconnected prior to the dismantling of technological components and underground and overground pipeline networks.

Remediation should be carried out in the manner described in Chapter 7.3.2 to avoid contamination of groundwater and the geological medium.

As a hazard in the case of remediation, the failure or overturning of trucks, the release of materials or waste used and stored in the facility into the environment during transport or accidents can be assumed.

In the event of an accident, there is the potential for spills of hydraulic oil or fuel, or chemicals used in the facility, into the ground and groundwater. In such a case, the source of contamination must be eliminated, the fault rectified, the contaminant replenished, the contaminated soil removed or replaced immediately in order to prevent environmental pollution.

If the site is completely dismantled, it will need to be recultivated to create infiltration conditions close to the original. After the remediation, a groundwater and media investigation of the site is recommended to detect any contamination and, depending on the extent of contamination, remediation can be planned and carried out.

7.3.5. Delimitation of the area covered

The direct areas of impact on groundwater and the geological environment during construction, operation and remediation are the areas of circulation of vehicles and machinery, as well as areas under buildings and paved surfaces, areas affected by soil deposition and soil and material disposal.

For groundwater, no indirect impact area can be determined. The indirect area of influence on soil and geological media is defined as the area affected by pollution emanating from air pollution sources and deposited by leaching or leaching on the topsoil. The exact extent of this area cannot be determined by modelling because the extent of leaching and leaching is highly dependent on atmospheric and meteorological conditions. In the case of operation below the immission limit value, i.e. in compliance with air quality protection parameters, the magnitude of the spillage, irrespective of the extent of spillage, may not reach the relevant pollution limit values, even long-term accumulation, due to the difference in magnitude between the maximum allowable concentrations in air and the limit values for soil or groundwater.

However, monitoring of soil and groundwater is the only way to verify this. The results of the monitoring proposed in chapter 12.2, which will also cover the topsoil, will allow the indirect impact of the activity to be assessed and quantified on the basis of measurements. If the measurements indicate a detectable increase in pollutant concentrations during the operation, the impact can be clarified and the area of influence can be limited by extending the monitoring area and by increasing the frequency of monitoring studies as proposed in the documentation.

7.4. Waste management

7.4.1. Impacts during the implementation period

Concrete, steel, plastic and asphalt construction waste is expected to be generated during the construction of paved surfaces and buildings. Municipal solid and liquid waste is also expected to be generated due to human presence.

Wastewater is collected, either by a mobile toilet or by an installed tank toilet to meet hygiene needs. For the collection of waste such as municipal solid waste, an installed container is required.

The removal and disposal of the waste water and waste generated is carried out by authorised companies.

The planning area is expected to generate more waste than the amount specified in Annex 1 of Joint Decree 45/2004 (VII.26.) of the Ministry of Agriculture, Forestry, Environment and Water Management, and the contractor will be obliged to collect waste separately. The contractor is obliged to declare if the amount of waste generated by the contractor exceeds the amount specified in Article 11 of Government Decree 309/2014 (XII.11). The type and expected quantity of waste generated is as follows:

95. Table 1: Waste generated during the construction phase

Name of the waste	Waste identifier	Estimated quantity
Concrete	17 01 01	12 t
Plastic	17 02 03	21 t
Bituminous mixtures other than those mentioned in 17 03 01	17 03 02	3 t
Iron and steel	17 04 05	19 t

During construction, the breakdown or maintenance of the machinery or elements of the machinery to be installed and the hazardous waste generated during the construction work is the responsibility of the contractor, and in the case of hazardous waste for which the investor is responsible, a temporary hazardous waste collection point is set up on the site.

In the latter case, the investor must take into account the provisions of Government Decree 246/2014 (IX.29.) according to:

- The collection point must have a suitable enclosure.
- It is advisable to purchase a hazardous waste container that is factory fitted with a damage protection and designed to withstand the chemical effects of the hazardous waste it is intended to store (typically waste oils and adsorbents contaminated with oils are likely to be generated).
- The container must be lockable and, where possible, appropriately separated from its surroundings.
- If the above is complied with, the installation of a leakage layer and an insulation layer is not necessary.

In the case of parallel work by several contractors, the above obligations apply equally to all the contractors and subcontractors concerned.

7.4.2. Impacts during the operational period

Waste from operations is generated from the following technologies and activities:

- battery production,
- battery testing,
- kitchen operation,
- wastewater treatment plant operation,
- maintenance.

A detailed description of the technologies is given in Chapter 4. Wastes generated during technological processes:

- slaughter waste from the production process
- Hazardous and non-hazardous waste between production
- hazardous waste generated during testing and equipment maintenance
- waste battery cells and their components

- paper, plastic and wood packaging waste (some of which is hazardous because of the substances it contains),

For non-hazardous packaging waste and cutting waste, clean foil is planned to be in the workplace waste bins inside the building and at the end of the shift it is planned to be collected at the EL building and PS building collection point until delivery off site.

Hazardous packaging waste, small quantities of hazardous waste from laboratories, hazardous waste from technological processes (e.g. aluminium and copper foil cutting waste, cutting dusts) are collected in workplace waste bins or dust collection containers and transported to the DW building at the end of the shift, where they are temporarily stored in the plant collection point until removal from the site.

During maintenance, waste rags and gloves, waste oil and other waste are also generated in this area. The waste generated is planned to be collected in separate areas within the building, near the production lines, and transported to the PS building plant collection point or the DW building plant collection point at the end of shifts.

Discarded batteries that cannot be de-energised by normal methods will be disassembled in the BS building and the removed anode foil will be treated in the anode foil treatment facility planned to be installed in the BD building. A detailed description of the planned waste management activities in the BS and BD buildings is given in chapter 7.4.3. The waste treated during the waste management activity is planned to be stored in the waste collection areas planned to be constructed in the BS and BD buildings, as described in more detail in section 7.4.3.

Wastes associated with the operation of the fire station of the installation, as referred to in chapter 4.4.6, are not generated during operation (normal operation).

The final version of the draft waste collection rules for on-site collection points, which is attached for information but not requested by the Licensee in the context of this procedure, will be submitted in a separate procedure.

According to a statement by the permit applicant, the installation, permitting and commissioning of the treatment plant at the facility precedes the commissioning of the technology. In addition, as stated in section 4.4.3.5, there will be no need to discharge untreated effluent from the treatment plant in the event of a breakdown or during maintenance. In view of this, no untreated effluent is expected to be generated as waste at the facility.

7.4.2.1. Process for on-site waste shipments

Waste from each plant collected in the workplace waste collectors and then taken to the plant collection point in the EL building, from where it is sorted and then taken to the plant collection point in the PS plant or to the plant collection point in the DW building. Some hazardous waste is sent directly from the workplace collectors to the plant collection point in the DW building. For the main types of waste, the process is described in detail in the Waste Collection Regulations.

The delivery of waste at the site is scheduled on a 3 daily, daily ,2 daily, 3 daily, weekly, 2 weekly, monthly or annual basis, depending on the production rate. Wastes that are delivered on an annual basis are typically generated during annual maintenance and are therefore not expected to be stored on site for long periods.

Waste generated in the planning area until its transfer to a recovery or disposal organisation 7
is planned to be collected in a separate area or at the NMP plant collection point, as shown in the table below.

96. Table 3: Summary of operational assembly points

Collection/storage depot number	Title	Size / useful Size	Maximum storage capacity (t)	Function	EOV Y	EOV X
I.	DW building factory assembly point (DW)	213,16 m2 / 127,8 m2 (65 palettes)	59,81	Hazardous waste (e.g.: waste electrolyte, electrolyte transport pipes waste from cleaning - DMC, anode sludge, cathode sludge, dismantled battery parts, post-cooking copper foil, filter materials contaminated with hazardous substances, wipes, gloves, waste motor oil, waste NMP detergent, Positive electrode: lithium nickel cobalt manganate + NMP, Negative electrode: lithium nickel cobalt manganate + NMP electrode: graphite + clean water, activated carbon waste contaminated with hazardous substances, semi-finished products contaminated with electrolyte waste battery cells, spent battery) for the collection of a building that serves as a gathering place.	835224,5 835250,9 835251,4 835224,9	251631,4 251632,3 251618,7 251617,9
II.	Central (Municipal) Collection Point (CW)	48 m2	0,4	In connection with kitchen, office activities and staff presence collecting the waste generated.	835253,3 835263,8 835264,4 835253,9	251490,8 251491,2 251472,1 251471,8
III.	EL Building Works Waste Water (SWTW)	566 m2 /340 m2 (150 palettes)	34,408	Temporary collection of technological waste from EL, AS, FO, SO buildings. Collection of non-hazardous packaging waste.	835732,8 835754,3 835754,6 835733,0	251454,5 251455,1 251442,4 251441,8
IV.	PS Building Works Waste Water Collection (PS SWW)	1750 m2 / 1225 m2 (600 palettes)	107	Off-site collection of technological waste from EL, AS, FO, SO buildings until the time of delivery. Collection of non-hazardous packaging waste.	835663,5 835716,3 835717,7 835664,8	251508,4 251510,1 251469,4 251467,7
V.	NMP factory collection point	2 x 75 m3	154,5	Above ground, horizontal cylindrical tanks for the storage of recovered, contaminated NMP.	835909,4 835942,0 835943,2 835910,2	251516,6 251517,7 251481,1 251492,1

Collection/storage depot number	Title	Size / useful Size	Maximum storage capacity (t)	Function	EOV Y	EOV X
VI.	BS Building Drainage Works (BSDW)	9,71 m^2	0,13	In the dismantling room, the scrap a fenced area for the collection of battery cells.	835250,8 835253,8 835253,9 835250,9	251549,3 251549,4 251546,0 251545,9
Storage 1	BD building storage area (BDW)	7,85 m^2	0,1	The anode foil, and the copper foil after treatment for waste collection fenced area.	835226,5 835229,8 835229,9 835226,5	251581,6 251581,7 251579,3 251579,2
Storage 2	BS building storage area (BSTW)	9,71 m^2	0,1	A fenced area in the test room for the collection of discarded battery cells.	835251,0 835254,0 835254,1 835251,1	251543,5 251543,6 251540,3 251540,2

The collection of waste at the various collection points is planned as follows.

97. Table 1: Characteristics of operational collection and storage sites

Collection/storage depot number	Building	HAK code	Name of waste	Name of waste	Collection container capacity (t)	Quantity produced (t/day)	Quantity to be produced before transport (t)	Frequency of delivery in the to a factory collection point
I.	DW	14 06 03*	other solvents and solvent mixture	Waste electrolyte	2	0,238	1,666	1 time a week
I.	DW	14 06 03*	Other solvents and solvent mixes	from cleaning of electrolyte transport pipes waste - DMC	4	0,596	2,982	1 time every 5 days
I.	DW	19 08 13*	hazardous substances from other industrial waste water treatment containing sludge	Anode sludge	1,5	0,073	0,364	1 time every 5 days
I.	DW	19 08 13*	hazardous substances from other industrial waste water treatment containing sludge	Cathode sludge	4	0,727	3,636	1 time every 5 days

I.	DW	16 02 13*	hazardous substances containing discarded equipment which different from 16 02 09	Disassembled battery cell parts	1,5	0,22	1,10	1 time every 5 days
Collection/storage depot number	**Building**	**HAK code**	**Name of waste**	**Name of waste**	**Collection container capacity (t)**	**Quantity produced (t/day)**	**Quantity to be produced before transport (t)**	**Frequency of delivery in the to a factory collection point**
			16 02 to 12 02 waste types					
I.	DW	19 02 11*	other containing dangerous substances Waste	De-energised anode foil	1	0,096	0,672	1 time a week
I.	DW	15 02 02*	absorbents contaminated with hazardous substances, filter materials (including oil filters not otherwise specified), wiping cloths, protective clothing	Filter materials, wipes, gloves contaminated with hazardous substances, crockery	4,5	0,35	2,45	1 time per week (Forms once per week)
I.	DW	13 01 05*	no chlorinated organic compounds containing emulsion	Waste hydraulic oil	0,5	0,35 / month	0,35	1 time per month
I.	DW	08 01 19*	containing organic solvents and other hazardous substances containing paint or varnish aqueous suspensions	Waste NMP washing liquor	15	14,475[a] / Month	14,475	1 time per month
I.	DW	08 01 13*	containing organic solvents or other dangerous substances paint and varnish sludge	Anode slurry waste Cathode slurry waste	1,5	1,09	1,09	1 time a day

I.	DW	16 02 13*	hazardous substances containing discarded equipment which different from 16 02 09 from types of waste up to 16 02 12	Electrolyte-contaminated semi-finished battery cell waste	11	5,10	10,2	Every two days 1 time
I.	DW	16 02 13*	hazardous substances containing discarded equipment which	Discharged scrap battery cella	8	3,60	7,2	Every two days 1 time
Collection/storage depot number	**Building**	**HAK code**	**Name of waste**	**Name of waste**	**Collecti on container capacity (t)**	**Quantity produced (t/day)**	**Quantity to be produced before transport (t)**	**Frequency of delivery in the to a factory collection point**
			different from 16 02 09 from types of waste up to 16 02 12					
I.	DW	06 01 06*	other acid	Hydrochloric acid, nitric acid (mixed)	0,01	0,00005	0,0015	1 time per month
I.	DW	16 07 09*	containing other dangerous substances Waste	Ink cartridge waste	1,5	0,015	1,3	3 per month
I.	DW	19 09 05	saturated or exhausted ion exchange resins	RO membrane and waste filter element waste (from waste water treatment)	2,5	0,025	2,25	3 per month
I.	DW	19 09 05	saturated or exhausted ion exchange resins	RO membrane and waste filter element waste (from water treatment)	1	0,008	0,74	3 per month
I.	DW	15 02 03	absorbents, filter materials, wipes, protective clothing, which different from 15 02 02	Waste molecular sieve	0,3	0,003	0,25	3 per month
II.	CW	20 03 01	other municipal waste, including mixed municipal waste also waste	Municipal waste	0,4	0,4	0,4	1 time a day

III.	EN	08 01 19*	containing organic solvents and other hazardous substances containing paint or varnish aqueous suspensions	Liquid NMP waste	10	73,26	Automatic based on liquid level sensor	Automatic Liquid level based on sensor[a]
III.	EN	16 01 18	non-ferrous metals	Waste copper foil	1,48	0,8386	0,8386	1-3- per day times[b]
III.	EN	16 01 18	non-ferrous metals	Waste aluminium foil	0,14	0,1030	0,1030	1-3 times a day
III.	EN	16 02 15*	scrapped from equipment removed dangerous Material from	Waste cathode foil	1,34	0,7667	0,7667	1-3 times a day
Collection/storage depot number	**Building**	**HAK code**	**Name of waste**	**Name of waste**	**Collection container capacity (t)**	**Quantity produced (t/day)**	**Quantity to be produced before transport (t)**	**Frequency of delivery in the to a factory collection point**
III.	EN	16 01 19	plastics	Waste separator film	0,048	0,0240	0,0240	1-3 times a day
III.	EN	16 02 15*	scrapped from equipment removed dangerous Material from	Waste from assembled rolls	1,200	0,960	0,960	1-3 times a day
III.	EN	16 02 13*	hazardous substances containing discarded equipment which different from 16 02 09 from types of waste up to 16 02 12	Semi-finished battery cell waste	12,00	8,730	5,88	1-3 times a day
III.	EN	16 01 18	non-ferrous metals	Scrap aluminium parts	0,600	0,210	0,390	1-3 times a day
III.	EN	15 01 10*	containing or contaminated with hazardous substances as residues packaging waste	Contaminated IBC container	0,200	0,135	0,135	1-3 times a day

III.	EN	15 01 10*	containing or contaminated with hazardous substances as residues packaging waste	Plastic waste collection drums	0,100	0,040	0,040	1-3 times a day
III.	EN	16 01 19	plastics	Waste polymer film	0,110	0,040	0,040	1-3 times a day
III.	EN	15 01 03	wood packaging waste	Waste wooden box	0,400	0,150	0,150	1-3 times a day
III.	EN	15 01 02	plastic packaging Waste	Plastic waste	1,77	0,51	0,51	1-3 times a day
III.	EN	15 01 06	other, mixed packaging waste	Other packaging waste	0,020	0,010	0,010	1-3 times a day
III.	EN	16 02 13*	hazardous substances containing discarded equipment which different from 16 02 09 16 02 to 12 02 waste types	Discharged scrap battery cella	3,00	3,530	1,178	1-3 times a day
III.	EN	14 06 03*	other solvents and solvent mixture	Waste electrolyte	1,000	0,238	0,714	1-3 times a day
Collection/storage depot number	**Building**	**HAK code**	**Name of waste**	**Name of waste**	**Collection container capacity (t)**	**Quantity produced (t/day)**	**Quantity to be produced before transport (t)**	**Frequency of delivery in the to a factory collection point**
III.	EN	14 06 03*	Other solvents and solvent mixes	from cleaning of electrolyte transport pipes waste (DMC)	1,000	0,600	0,600	1-3 times a day
IV.	PS	15 01 01	paper and cardboard packaging waste	Paper waste	4	0,455	3,18	1 time a week
IV.	PS	15 01 03	wood packaging waste	Waste wood	2	0,152	1,06	1 time a week
IV.	PS	15 01 02	plastic packaging Waste	Plastic waste	2	0,152	1,06	1 time a week
IV.	PS	15 01 04	metal packaging Waste	Scrap metal	2	0,155	1,08	1 time a week
IV.	PS	16 01 18	non-ferrous metals	Aluminium foil from positive electrode production Waste	12	1,534	10,74	1 time a week

IV.	PS	16 02 13*	hazardous substances containing discarded equipment which different from 16 02 09 from types of waste up to 16 02 12	Copper foil scrap from negative electrode production	12	1,534	10,74	1 time a week
IV.	PS	16 01 18	non-ferrous metals	Foil waste	2	0,242	1,70	1 time a week
IV.	PS	15 01 04	metal packaging Waste	Scrap metal	1	0,036	0,25	1 time a week
IV.	PS	16 02 15*	scrapped from equipment removed dangerous Material from	Electrolyte-contaminated semi-finished battery cell waste	70	9,4	65,8	1 time a week
V.	NT	08 01 19*	containing organic solvents and other hazardous substances containing paint or varnish aqueous suspensions	Liquid NMP waste	154,5	73,26	Automatic based on liquid level sensor	Automatic Liquid level based on sensor[a]
VI.	BS	16 02 15*	scrapped from equipment	Waste cathode foil	0,1	0,158	0,052	Per shift
Collection/storage depot number	**Building**	**HAK code**	**Name of waste**	**Name of waste**	**Collection container capacity (t)**	**Quantity produced (t/day)**	**Quantity to be produced before transport (t)**	**Frequency of delivery in the to a factory collection point**
			removed dangerous Material from					
VI.	BS	16 01 19	plastics	Waste polymer film	0,01	0,003	0,003	1 time a day
VI.	BS	16 02 15*	scrapped from equipment removed dangerous Material from	Used battery parts	0,01	0,062	0,01	The rate of generation

VI.	BS	15 02 02*	absorbents contaminated with hazardous substances, filter materials (including oil filters not otherwise specified), wiping cloths, protective clothing	Filter materials, wipes, gloves contaminated with hazardous substances, crockery	0,01	0,002	0,002	1 time a day
Storage 1	BD	16 02 15*	scrapped from equipment removed dangerous Material from	Waste anode foil	0,05	0,12	0,04	The rate of generation
		19 02 11*	hazardous substances other waste containing	Waste copper foil	0,05	0,12	0,04	The treatment according to the pace
Storage 2	BS	16 02 15*	scrapped from equipment removed dangerous Material from	Used battery parts	0,1	0,04	0,04	1 time a day

[a] is generated once a month during tank cleaning

[b] the maximum quantity generated, taking into account that deliveries may be made once, twice or three times a day

98. Table 1: Summary of the estimated amount of waste generated on the site

Waste identification code	Name of waste	Name of waste	How to collect	Quantity produced (t/year)	Waste treatment method
14 06 03*	Other solvents and solvent mixes	Waste electrolyte	200 litres antistatic dish	78,589	R1
Waste identification code	**Name of waste**	**Name of waste**	**How to collect**	**Quantity produced (t/year)**	**Waste treatment method**
14 06 03*	Other solvents and solvent mixes	Cleaning of electrolyte transport pipes waste from (DMC, C_3H_6O)	barrel	196,795	R1
15 01 01	paper and cardboard packaging waste	Paper packaging waste	big bag	150	R3
15 01 03	wood packaging waste	Wood packaging waste	big bag	50	R12 (E0206), R3a
15 01 02	plastic packaging waste	Plastic packaging waste	big bag	50	R1, R3
15 01 04	metal packaging waste	Metal packaging waste	big bag	51	R4
15 01 06	other mixed packaging waste	Other packaging waste	big bag	3,5	R1, R3
19 08 13*	from other treatment of industrial waste water, sludge containing hazardous substances	Cathode cleaning wastewater sedimentation tank sludge	IBC	24	R1

19 08 13*	sludge containing dangerous substances from other treatment of industrial waste water	Anode cleaning wastewater settling tank sludge	IBC	240	R1
15 02 02*	absorbents, filter materials (including unspecified oil filters), wiping cloths contaminated with hazardous substances, protective clothing	Spent filter element	big bag	76,8	R1
19 09 05	saturated or exhausted ion exchange resins	RO membrane and waste filter element waste (from waste water treatment)	big bag	9	R1
13 01 05*	emulsion not containing chlorinated organic compounds	hydraulic oil waste	barrel	4,5	R1, R9
15 01 10*	packaging waste containing or contaminated with hazardous substances as residues	Waste reagent bottle	paper box	159,41	R1
16 07 09*	waste containing other hazardous substances	Ink cartridge waste	big bag	5	R3
15 02 02*	absorbents, filter materials (including unspecified oil filters), wiping cloths contaminated with hazardous substances, protective clothing	Waste rags, gloves	big bag	30	R1
06 01 06*	other acid	Hydrochloric acid, nitric acid (mixed)	200 litre closed plastic drum	1,5	R1
16 01 18	non-ferrous metals	Metal scrap - Cathode electrodes produced from aluminium foil scrap	big bag	506,25	R4
16 02 13*	discarded equipment containing dangerous substances, other than from 16 02 09 to 16 02 12 waste types	Anode electrodes made from copper foil waste	big bag	506,25	R4
08 01 13*	paint and varnish sludge containing organic solvents or other dangerous substances	Cathode electrode lithium nickel cobalt manganate+ NMP and Negative electrode: graphite+ clean water	Large-size big bag (Ton bag)	359,6	R12, R4, R1
Waste identification code	**Name of waste**	**Name of waste**	**How to collect**	**Quantity produced (t/year)**	**Waste treatment method**
16 01 18	non-ferrous metals	Foil scrap	big bag	80	R3a
16 02 13*	discarded equipment containing dangerous substances, other than from waste types 16 02 09 to 16 02 12	Flat battery cell	plastic box	1193,94	R4
16 02 13*	discarded equipment containing dangerous substances, other than from waste types 16 02 09 to 16 02 12	Semi-finished battery cells"	plastic box	4826,25	R4

16 02 15*	removed from scrapped equipment hazardous material	Disassembled battery cell parts	closed container	72,5	R4
19 02 11*	other waste containing hazardous substances	De-energised anode foil	closed container	31,68	R4
08 01 19*	aqueous suspensions of paint or varnish containing organic solvents or other dangerous substances	Waste NMP washing liquids"	IBC tank	173,7	R1
16 01 18	non-ferrous metals	Scrap metal	big bag	12	R4
08 01 19*	paint or varnish containing organic solvents or other dangerous substances aqueous suspensions	NMP, NMP waste fluid	Via pipelines to the tank park	24 176,95	R2
19 09 05	saturated or exhausted ion exchange resins	Waste RO filter (from water treatment)	big bag	3	R1
15 02 03	absorbents, filter materials, wipes, protective clothing other than those mentioned in 15 02 02	Waste molecular sieve	big bag	1	R1
20 03 01	other municipal waste, including mixed municipal waste	Municipal waste	5 m^3 container	132	D5
16 01 19	plastics	Separator foil waste	big bag	7,92	R1b

Design of the operational assembly points according to §§ 14-16 and Annex 2 of Government Decree 246/2014 (IX. 29.)

planned. The main characteristics of the different buildings are described in chapter 3.2, the floor layouts to be applied are described in chapter 3.2.

Chapter 4.14.1.1 and the site plans for the location and design of the buffer zones attached in Annex 2.3.

Operational collection points are planned as waste management facilities with a spatially defined collection area. The access route and the pavement of the collection area to and within the site of the site collection point shall be provided with a uniform and continuous pavement for non-hazardous waste collection and with a uniform, continuous, impermeable and solid pavement for hazardous waste collection. In practice, this means that the access roads to the collection points of the plants with ID I and II will be paved with impermeable pavement. For site II, the enclosure of the collection area is planned to be made of a material that is resistant to chemical reactions that may occur in the event of interaction with hazardous waste. The external and internal circulation routes and collection areas will be designed in proportion to the volume of waste to be collected, so as to be easily accessible for mechanical handling and transport equipment. It is planned to mark the collection points with signs and, where appropriate, to erect signs warning of the hazardous nature of the waste. All signs will be clearly visible and legible to all.

At the collection points, waste is planned to be collected separately by type of waste, by type of waste or according to the nature of the waste. Collection containers and bins placed at operational collection points shall be provided with a distinctive sign or marking indicating the type of waste, waste character or type of waste collected therein. The condition of the collection containers, receptacles and collection areas (road and pavement surfaces) used for collection will be regularly checked, cleaned and repaired as necessary.

Waste may be collected at an on-site collection point for the period specified in the operating rules, but for no longer than 1 year.

Other requirements:

- No waste other than waste generated on the premises or within the premises, tools and equipment necessary for its operation may be collected, deposited or stored in an operational collection point. During collection, free and unhindered access to the waste shall be ensured at all times.
- The operator shall ensure that the site is guarded and protected against unauthorised persons.
- If hazardous waste is collected at the site, the technical arrangements for the operation of the collection point must ensure that hazardous waste is not contaminated during the collection period.
- Hazardous waste may only be collected at a collection point in a collection container (in particular, in an impact-resistant, lined or double-walled lockable collection container or in a lockable container) with technical protection that prevents the waste from escaping into the environment and that meets the collection requirements of the Government Decree on the detailed rules for hazardous waste activities.

- According to the National Fire Safety Regulations, hazardous waste of explosive class, containing organic or inorganic substances that react with each other or with themselves and are rapidly decomposing, may be collected in quantities and in a manner approved by the competent authority.
- Collection containers and receptacles containing reactive hazardous waste must be spaced so that they cannot react with each other when opened.
- The following technical equipment shall be provided as a minimum for the operation of the assembly point: decontamination materials; fire extinguishers; hand tools; personal protective equipment; telephone.

Annex 1.15 to this document contains for information the draft operating rules for operational assembly points. The application for the adoption of the operating rules will be submitted to the Authority in a separate procedure.

In the course of its activities, the permit applicant shall comply with the provisions of Article 17 of Government Decree 246/2014 (IX. 29.) on the rules for the construction and operation of certain waste management facilities.

Design of the operational assembly points according to §§ 14-16 and Annex 2 of Government Decree 246/2014 (IX. 29.)
planned as follows:

- covered design,
- a minimum layer thickness of 25 cm, resistant to the chemical effects of hazardous waste (3a layering as described in chapter 4.14.1.1.
- For the DW building, which will include a hazardous waste collection facility, the Permittee plans to install a control leachate layer and a control containment layer as specified in Section 1.2.2 of the Order.

Where appropriate, the use of a damage tray is planned.

Workplace waste bins are planned for collection of waste from the production areas in each building, with separate collection of certain technological wastes and municipal waste. From the workplace collectors, the waste described above and waste from cleaning activities will be transferred to the transfer waste collectors and from there to the plant collection points during daily or shift deliveries. Waste generated during maintenance (worn filters, engine oil, etc.) is not collected at the point of generation. Once generated, they are transported to the plant collection point.

The design of workplace assembly points is planned in accordance with Article 13 of Government Decree 246/2014 (IX. 29.).

Workplace collection points will be located where waste is generated. If the workplace collection point is not established as a separate site, a line or fence will be painted to separate the workplace collection point from other facilities on the site and signs will be erected to mark the workplace collection points. The sign shall indicate the workplace assembly point in such a way that it is clearly visible and legible to all. The type and capacity of the collection containers will be chosen in such a way as to ensure non-polluting collection based on the type, nature, size, quantity and weight of the waste. Only waste generated on the same site as the workplace collection point will be collected at the workplace collection point. At the workplace collection point, waste is planned to be collected separately according to the type of waste, the type of waste or the nature of the waste. The collection container, or the container is designed to be marked with a distinctive sign indicating the type or kind of waste it is intended to contain. In the case of hazardous waste collection, only a container or receptacle with technical protection is intended to be used as a collection container or receptacle that prevents the waste from escaping into the environment and that meets the requirements for collection laid down in the Government Decree on the detailed rules for hazardous waste activities.

Waste collection at workplace collection points can take place for a maximum of 6 months. The capacity of the workplace collection points is detailed in the table in Annex 1.17 and their exact location is shown in the site plan in Annex 2.7.

The amount of waste expected to be generated during operation is given in the tables below.

99. Table 1: Non-hazardous waste generated during operation

HAK	Name of the waste	Name of the waste	Annual volume [t]
15 01 01	paper and cardboard packaging waste	Paper	150
15 01 02	plastic packaging waste	Plastic	50
15 01 03	wood packaging waste	Fa	50
15 01 04	metal packaging waste	Metal waste	51
15 01 06	other mixed packaging waste	Other packaging waste	3,5
16 01 18	non-ferrous metals	Positive electrode production from aluminium foil waste	506,25
16 01 18	non-ferrous metals	Foil scrap	80
16 01 18	non-ferrous metals	Scrap metal	12
19 09 05	saturated or exhausted ion exchangers resins	Waste RO filter	3
15 02 03	absorbents, filter materials, wipes, protective clothing, which different from 15 02 02	Waste molecular sieve	1
19 09 05	saturated or exhausted ion exchangers resins	Waste RO membrane and waste filter (water and waste water)	12
20 03 01	other municipal waste, including mixed municipal waste	Municipal waste	132
16 01 19	plastics	Separator foil waste	7,92
Total			**1058,67**

Information on the amount of hazardous waste generated is given in the table below.

100. Table 1: Hazardous waste generated during operation

HAK	Name of the waste	The name of the waste	Annual volume [t]
14 06 03*	Other solvents and solvent mixes	Electrolyte waste	78,589
14 06 03*	Other solvents and solvent mixes	DMC, C_3H_6O	196,795
15 02 02*	absorbents, filter materials (including unspecified oil filters), wiping cloths contaminated with hazardous substances, protective clothing	Waste filters contaminated with harmful substances	76,8
13 01 05*	no chlorinated organic compounds containing emulsion	Hydraulic oil	4,5
HAK	**Name of the waste**	**The name of the waste**	**Annual volume [t]**

15 01 10*	containing or contaminated with hazardous substances as residues packaging waste	Waste reagent bottle	159,41
16 07 09*	containing other dangerous substances Waste	Ink cartridge waste	5
15 02 02*	absorbents, filter materials (including unspecified oil filters), wiping cloths contaminated with hazardous substances, protective clothing	Cloths, gloves, etc. contaminated with hazardous substances.	30
06 01 06*	other acid	Hydrochloric acid, nitric acid (mixed)	1,5
16 02 13*	discarded equipment containing dangerous substances which different from wastes of types 16 02 09 to 16 02 12	Waste copper foil from the production of negative electrodes	506,25
08 01 13*	organic solvents or other paint and varnish sludge containing dangerous substances	Anode slurry waste Cathode slurry waste	359,6
16 02 13*	discarded equipment containing dangerous substances which different from wastes of types 16 02 09 to 16 02 12	Waste battery cell	1193,94
16 02 13*	discarded equipment containing dangerous substances which different from wastes of types 16 02 09 to 16 02 12	Half-finished battery cell	4826,25
16 02 15*	equipment removed from scrapped equipment hazardous material	Dismantled battery cell spare part	72,5
08 01 19*	paint containing organic solvents and other hazardous substances or aqueous suspensions containing varnish	Waste NMP and washing tank	173,7
08 01 19*	paint containing organic solvents and other hazardous substances or aqueous suspensions containing varnish	NMP waste (liquid)	24 176,95
19 02 11*	other containing dangerous substances Waste	Copper foil after waste treatment	31,68
19 08 13*	hazardous substances from other industrial waste water treatment containing sludge	Cathode cleaning wastewater sedimentation tank sludge	24
19 08 13*	hazardous substances from other industrial waste water treatment containing sludge	Anode cleaning wastewater settling tank sludge	240
Total			**32 157,46**

The following companies have been approached to take back the waste generated, which are expected to meet the needs:

- Municipal waste: AKSD Kft.
- Separately collected packaging waste P.M.R. Ltd.
- Other non hazardous waste: Metal Shredder Hungary Zrt.
- Hazardous waste: Metal Shredder Hungary Zrt. (the disposal is planned to be partly , as stated in the declaration of acceptance in principle.)

The acceptance declaration for hazardous and non-hazardous waste is attached in Annex 1.11. The waste service company may be changed in the future. The following wastes are expected to be generated during an emergency event:

- 17 05 03* soil and stones containing dangerous substances
- 15 02 02* absorbents contaminated with dangerous substances, filter materials wipes, protective clothing.

The waste generated is recorded in accordance with the provisions of Government Decree 309/2014 (XII. 11.). The collection of municipal waste is carried out in accordance with the provisions of Government Decree 169/2024 (29.VI.) and the collection of hazardous waste is carried out in accordance with the provisions of Government Decree 246/2014 (29.IX.).

The Licensee intends to fulfil the obligation pursuant to Article 5 of Government Decree 445/2012 (XII. 29.) by using a concession company in the framework of collective performance.

Other hazardous waste is generated on site during maintenance work, the management and removal of which is the responsibility of the organisation carrying out the maintenance work and the storage of which is not planned on site.

7.4.3. Waste management permit application

7.4.3.1. Basic data

As described in chapter 2.1.

7.4.3.2. Technical and environmental characteristics of the installation

The technical design of the site is described in chapter 3.1.1 and the expected impacts on the environmental elements are described in chapter 7.
described in more detail in chapter.

The licensing of the installation is planned in the light of this application, so the technical status of the installation cannot be interpreted. The technical equipment of the planned facility will be in line with current industrial standards and will be characterised by a technology that is outstanding by European standards.

7.4.3.3. Name of the waste management activity and treatment operation, detailed description of the methods and treatment technology to be used in the treatment operation

Eve Power Hungary Kft. is planning to build a new battery cell manufacturing site at the Debrecen municipality of Debrecen, Hungary. 0237/405, located along the BMW Boulevard. The facility is planned to manufacture lithium-nickel-cobalt-manganese based batteries. An integral part of the manufacturing activity will be the production of testing and inspection, generating waste batteries. The waste batteries generated can only be handed over to a recovery or disposal organisation after being discharged (drained), and therefore batteries that are found to be defective are drained using dedicated equipment before being transported to the collection area.

In the event that the battery failure is of such a nature, or is detected at such a stage of manufacture, that discharge cannot be achieved by normal means, disassembly of the battery and separate handling of the anode foil should be provided. The need for the proposed pre-treatment method is justified by the reactivity of the lithium ions on the surface of the anode foil to be removed from the live battery, as follows.

- Lithium-ion batteries work on the principles of electrochemistry. The basic mechanism of operation involves the movement of lithium ions from the negative electrode to the positive electrode during discharge and vice versa during charge.
- The main components of a lithium-ion battery:
    - **Anode foil**: The anode of a lithium-ion battery is usually made of graphite. When the battery is charged, lithium ions are attracted to the anode and are stored between the graphite layers.
    - **Cathode foil**: The cathode foil consists of lithium metal oxide. During the discharge process (when the battery is used), the lithium ions move from the anode to the cathode through the electrolyte. The movement of the ions creates free electrons at the anode, which creates a charge at the positive collector. The electric current then flows from the current collector through the powered device to the negative current collector.
    - **Electrolyte:** electrolyte transports positively charged lithium ions from the anode to the cathode and vice versa. The electrolyte is typically a mixture of organic carbonates.
    - **Separator foil:** The separator foil, as the name suggests, separates the anode and the cathode. It forms a permeable layer and allows the ions to flow, but prevents direct contact between the anode and cathode, which could lead to a short circuit.
- The process itself is a reversible reaction, so the battery can be recharged several times. Over time, however, the capacity of the battery decreases due to a number of factors, including the gradual loss of lithium ions and physical and chemical changes in the electrodes.
- In a fully charged lithium-ion battery, the lithium ions are stored at the anode. During discharge (when the battery is used), these lithium ions move through the electrolyte to the cathode. The movement of the ions from the anode to the cathode generates the electric current that powers the device that the battery operates.
- In contrast, in a fully discharged battery, most of the lithium ions move from the anode to the cathode. When the battery is recharged, the ions are transferred back to the anode where they are stored until the next discharge cycle.
- The lithium-ion battery anode, which stores lithium ions when the battery is charged. Lithium is a very reactive element, especially in contact with water. It reacts violently with water, forming lithium hydroxide and hydrogen gas, which is highly flammable.
- When the battery is discharged, the lithium ions move from the anode to the cathode and become part of the stable metal oxide structure. This chemical bonding reduces the reactivity of the lithium ions, making the cathode less flammable compared to the anode.

- In summary, only the anode foil requires further treatment in the BD building due to:
    - The anode of a charged lithium-ion battery contains lithium ions, which are chemically unbonded and highly reactive. If the anode comes into contact with water or moisture in the air, it can react violently and ignite due to the formation of hydrogen gas.
    - The cathode is generally more stable because the lithium ions are chemically bonded within the metal oxide structure.
    - The anode foil is placed in vacuum-sealed packaging to avoid reaction with oxygen. The purpose of providing an oxygen-free environment is to prevent the possibility of fire or explosion.
    - For safety, the anode foil is stored in an explosion-proof cabinet until it is used in the handling equipment.
    - In the treatment unit, water is sprayed over the surface, starting the exothermic chemical process.

The activity described below is intended to be used by the Licensee exclusively for the treatment of its own battery cell waste generated during production and testing. The Licensee does not intend to receive and treat battery cell waste from external/third parties.

Battery cell disassembly

Non-dischargeable spent battery cells are transported to a dedicated room in the BS building for dismantling. The dismantling operation consists of cutting the battery cells and dismantling them into their components (anode, cathode, separator). The cutting of the battery cells shall be carried out with a non-sparking (e.g. ceramic) knife and under constant suction.

During the activity, the battery cell is disassembled into the following elements:

- Anode foil: ~124 g/battery cell
- Cathode film: ~180 g/battery cell
- Separator film: ~9 g/battery cell
- Electrolyte (as part of the jellyroll): 38 g/battery cell
- Metal housing: 58 g/battery cell
- Metal terminals: 13 g/battery cell

The exact steps to disassemble the battery cell are given below:

- Cutting the battery cell with a non-sparking (e.g. ceramic) knife.
- Removing the copper connection and then gradually removing the metal housing from the jellyroll.
- Remove the metal housing and cut the jellyroll along the separator film.
- Separation of the cathode and separator foil from the anode foil.
- Wrapping the various ingredients in plastic film and placing them in the appropriate collection containers.

Battery cell disassembly:

- equipment designed for use: non-sparking (e.g. ceramic) knife
- daily capacity: 407 kg/day
- storage capacity of the waste storage area: 100

kg Handling of anode foil:

- o equipment designed for use: anode foil handling equipment
- o daily capacity: 120 kg/day
- o storage capacity of the waste storage area: 100 kg

Disassembly must carried out with constant extraction. After dismantling, anode foils that pose a safety risk are vacuum-packed and transported to the BD building.

The other components of the battery cell (separator foil, cathode foil, etc.) are designed separately in a sealed container collected in a dedicated room and transferred to DW's plant collection point at least every shift.

Based on the data provided by the applicant, the electrolyte content of the dismantled battery resulting from the above steps cannot be separated from the other components, so no separately collected electrolyte waste from batteries and accumulators with HAC code 16 06 06* is expected to be generated during the dismantling activities.

Handling the anode foil

After dismantling, the anode foils, which pose a safety risk, are vacuum packed and transferred to the BD building. In the BD building, the anode films are placed in a handling unit (maximum 5 kg at a time, maximum 120 kg per day). The anode films spontaneously ignite when exposed to water. Therefore, water is sprayed into the combustion chamber after the foils have been inserted, causing the anode foil to catch fire. The burning process takes about 15 minutes. After the combustion process is completed, the slag is removed manually from the combustion chamber after the equipment has cooled down.

As described above, the planned waste management activity is recovery or prior pre-treatment of
as follows:

- R12: Transformation to perform any of the operations numbered R1 to R11 (in the absence of an R code, this operation may include pre-recovery preparatory operations such as sorting, chopping, compacting, pelletising, drying, crushing, conditioning or separation prior to R1 to R11).
- The planned pre-treatment activity:
  - Physical pre-treatment, conversion:
    - o E02 - 08 Demolition of waste electrical and electronic equipment
  - Chemical pretreatment, conversion:
    - o E03 - 04 oxidation, reduction

7.4.3.4. The type, nature, type, composition and annual quantities of waste treated per type of waste, with an indication of the treatment operation

The range of wastes to be treated by type of waste is set out in the table below.

101. Table 1 Quantities of waste to be accepted for treatment

Waste code	Name of waste	Annual quantity (t/year)
16 02 13*	discarded equipment containing dangerous substances which different from wastes of types 16 02 09 to 16 02 12	134,4
16 02 15*	hazardous waste removed from discarded equipment	39,6
	material (anode foil)	

The quantities of waste per treatment code and the treatment method are given in the table below.

102. Table 1: Waste management method and capacity planned

Waste code	Treatment method	Annual quantity (t/year)
16 02 13*	R12/E02 - 08 (waste electrical and electronic equipment dismantling of equipment)	134,4
16 02 15*	R12/E03 - 04 (oxidation, reduction)	39,6

7.4.3.5. Name of the area concerned by the management operation

The planned location of the activity is the area of Debrecen, parcel 0237/405.

The location of the activities described in chapter 7.4.3.4 is the following areas within the property:

- dismantling of waste electrical equipment: Battery test lab
- Oxidation, reduction: Anode foil treatment building

Transport between buildings is carried out on trays or in specially prepared boxes for batteries classified as defective, in sealed containers for dismantled battery components and in vacuum packs and explosion-proof sealed containers for anode foil.

Waste battery storage in the BS building is planned to be in waste container BS-B111 as shown on the site plan of the BS building in Annex 2.4. The storage of waste from battery dismantling, except for anode foil, is also planned in the dedicated room BS-B107 as shown in the above site plan. Dismantling is planned to take place in room BS-B110. The stratification under the premises is described in the relevant part of chapter 4.14.1.1 and complies with the requirements of Annex 2, point 1.2.2 of Government Decree 246/2014 (29.IX.).

In the BD building, the anode foil will be stored in the waste collection area in room BD-A101, separated from the surrounding area by a chain, as shown in the site plan of the BD building in Annex 2.4. The same area will be used for the collection of copper foil waste after treatment. The stratification under the premises is described in the relevant part of chapter 4.14.1.1 and complies with the requirements of Annex 2, point 1.2.2 of Government Decree 246/2014 (29.IX.2014).

7.4.3.6. The human, material and sanitary conditions necessary for carrying out the treatment operation, the treatment technology used and the technical characteristics, condition, quality and equipment of the tools, equipment and vehicles

In the BS building, the dismantling of defective batteries is carried out by 2 people per shift, while in the BD building, the anode foil handling is carried out by 1 person per shift. The waste recovery activity will therefore be carried out by 3 persons per shift, based on preliminary plans, for a total of up to 9 persons.

The staff to be recruited will have the necessary legal qualifications for the job and detailed instructions will be drawn up to carry out the activity.

In order to comply with the hygiene and sanitary standards of workers, it is planned to provide a number of changing rooms and toilets on the site, equipped in accordance with the legal requirements. The construction of first-aid stations in the work areas is planned in accordance with the provisions of the Joint Decree 3/2002 (II. 8.) of the Ministry of Social Affairs, Labour and Social Policy of the Republic of Poland.

It is planned to provide an ambulance in the area in the quantities and with the equipment required by the MSZ 13553 standard. Taking into account the number and composition of the workforce currently planned for the site, it is not expected that the values specified in Annex 3 to Government Decree 89/1995 (14 July) will be exceeded, so it is not planned to provide continuous medical surveillance.

The Licensee's declaration in relation to the above is attached at Annex 1.18. Due to the nature of the activity and the wastes to be treated, no significant rodent infestation is expected in the area. If such a problem should arise, the Licensee will carry out rodent control by a specialist company.

The equipment, vehicles and machinery to be used in the facility will be newly purchased as part of the development. The equipment to be purchased will represent the most advanced technology available to current industry standards. Maintenance at the specified intervals is essential to ensure a continuous work schedule. The Licensee has an economic interest in the quality and condition of the equipment and machinery.

7.4.3.7. Treatment technology details

The collection and treatment of the auxiliary materials used in the treatment and the collection and treatment of rainwater

No auxiliary materials are used in the treatment activity, as long as general maintenance materials (parts of machinery and equipment) are not considered.

Precipitation falling on paved surfaces, with the exception of roof surfaces, is cleaned with an oil and sludge trap. The oil traps to be installed will have a cleaning efficiency of 5 mg/l COD.

The quantity, , nature, composition, physical form, treatment and further use of the material and waste generated during treatment

The amount of waste generated during treatment and recovery activities is given in the table below. As mentioned above, the anode foil with HAK code 16 02 15* from the waste management activity R12/E02 - 08 (dismantling of waste electrical and electronic equipment) will be further treated by the waste management method R12/E03 - 04 (oxidation, reduction). Waste generated during recovery and pre-treatment activities R12/E02 - 08 (cathode foil and separator foil with electrolyte) is also registered under HAK code 16 02 15* and transferred to an organisation with a waste management permit, while scrap metal (terminals and outer casing) from battery dismantling is transferred to a recovery organisation under HAK code 16 01 18.

Other wastes (residues from the combustion chamber) containing dangerous substances with HAK code 19 02 11* are expected to be generated during the treatment of anode foil.

It is proposed to treat the contaminated absorbent waste from the activated carbon separation systems planned to be used in several locations in the installation under one HAC code (15 02 02*; absorbents, filter materials (including unspecified oil filters), wipes, protective clothing contaminated with hazardous substances).

103. Table 1 Main characteristics of and secondary waste generated during waste treatment

Code number	Title	Physical Appearance	Treatment / disposal How	Quantity [t/year]
16 02 15*	from scrapped equipment hazardous material removed	solid	R4	72,5
16 01 18	non-ferrous metals	solid	R3a	22,7
19 02 11*	containing dangerous substances other waste	solid	R4	39,6

Control points critical to the management process

To monitor the amount of waste batteries and battery components generated, a hydraulic lifting device with a weight measurement function is planned. Back-weighing and verification will be ensured by the use of a verifiable weighing instrument to be installed in the DW building.

Material balance of the treatment

The estimated material balance of the treatment is shown in the table below. The amount of material loss during anode foil treatment cannot be accurately determined at this stage of the design, and in view of this, it is assumed for safety reasons that the total amount will be wasted.

104. Table 1 Estimated material balance of the treatment

Code	R12 E02 - 08	R12 E03 - 04	Generating waste		
			16 02 15*	**16 01 18**	**19 02 11***
16 02 13*	134,4		112,1	22,3	
16 02 15*		39,6			31,68

The total amount of waste expected to be treated is 134.4 tonnes/year, of which 39.6 tonnes/year will be subject to two-step treatment as described above. The amount of waste generated (the loss of material during exothermic processes) will be the same as the amount of waste planned to be treated, but the treatment will result in a reduction in the hazardousness of the dismantled waste batteries, an improvement in their transportability and an increase in the proportion of waste that can be recovered.

Technical and environmental characteristics of the treatment technology

The technical design of the site is described in Chapters 3.2 and 4, and the expected impacts on the environmental elements in
is described in detail in Chapter 7.

The environmental and economic objective to be achieved by the treatment operation, or, in the case of recovery, the environmental and economic benefits, advantages or gains to be obtained from the production, manufacture or on the market of the substance or product to be produced

The activity will result in the dismantling of defective batteries that cannot be discharged by normal technical means, after which the anode foil will be treated in a facility, generating lower hazardous waste for further recovery or disposal.

Given that the waste management activity for which the authorisation is sought is designed to use self-produced waste - defective batteries - and that its fundamental objective is to reduce the hazardousness of waste, the environmental and economic benefits and advantages of producing, manufacturing or placing on the market the substance or product to be produced cannot be interpreted as a matter of concern.

A Ht. Certificate of termination of waste status as defined in Article 9(1)

The certificate pursuant to Article 9(1) of the Waste Management Act is attached in Annex 1.18. The applicant intends to establish an appropriate quality assurance system before the start of the activity

(The certification audit of some elements of the management system requires that actual activities and operations take place).

The financial means available to the applicant for carrying out the management activity, their guarantees and declarations of their existence; plans for setting up a reserve and proof of the fact that environmental insurance has been taken out

The obligations of the Licensee to provide financial security and environmental insurance are defined by the provisions of Government Decree 681/2023 (29.XII.). The same Decree states that there is no obligation to set aside provisions.

The detailed calculation is presented in Chapter 13.

The relevant documents (insurance policy, and bank guarantee certificate) the documentation 1.19 are attached in annex.

Detailed plans for environmental safety, plans to deal with possible damage (accidents), detailed plans for monitoring, detailed plans for the abandonment of activities

A mitigation plan will be developed and approved for the facility before normal operation begins. Detailed information on the monitoring plans is provided in sections 7.12.2.

Prior to the clean-up, valuable waste on the site will be sold. Other waste that cannot be sold will be transferred to a recovery or disposal organisation.

This will be followed by the dismantling of buildings, utilities, fittings and equipment in accordance with the legal requirements in force at the time of the liquidation. Detailed descriptions are given in the chapters on the assessment of the different environmental elements during the period of remediation.

Method and conditions of on-site storage of waste

See chapter 7.4.2 for a detailed description.

Proof of employment of the environmental officer

EY denkstatt Ltd. will be the environmental agent for the waste management activity to be licensed under this chapter.

The agreement and proof of qualification are attached in Annex 1.20.

Proof of registration in the database of taxpayers without public debt

The tax authority's certificate is attached in Annex 1.21.

Declaration of the applicant's previous waste management activities pursuant to § 11

The Licensee has not previously carried out waste management activities.

A statement on whether applicant has taken into account the possibility of employing a jobseeker who is disadvantaged in the labour market, as provided for in the Act on the Promotion of Employment and Unemployment Benefits

The declaration is attached in Annex 1.18.

7.4.4. Effects during the winding-up period

The clean-up is expected to generate significant amounts of construction and demolition debris. When selecting the materials to be used for construction, the designers will seek to ensure that the materials used can be recycled in the future. The types of construction and demolition waste generated and the obligations are the same as those described in section 7.4.1, assuming that the legal requirements remain unchanged.

The machinery, equipment and tanks are expected to salable, and therefore not to be disposed of as waste.
are .

Prior to the start of demolition, the removal of waste, raw materials and chemicals from the site, and the emptying and cleaning of machinery and equipment must be carried out. Demolition of surface and subsurface sewer sections shall only commence after they have been drained.

In the event of the site's complete closure, the site will need to be recultivated, as part of which the above tasks can also be refined to take account of current material quantities.

7.4.5. Delimitation of the area covered

From a waste management point of view, the designation of the area of influence is not meaningful. The impact of the activity on air and noise pollution and the additional traffic generated is discussed in the relevant chapters.

7.5. Nature protection and landscape conservation

7.5.1. Default state

For information on sites of natural value in the vicinity of the site concerned, see Chapter 5.7. Site preparation is ongoing for the property concerned. The site was previously used as arable land. The area is subject to continuous disturbance from surrounding activities and from the road.

7.5.2. Nature conservation

7.5.2.1. Evolution of drivers, processes and agents as a result of activity in the study area

Area of the plant and the study area for the protection of wildlife

In defining the area of influence, important considerations were the surface morphology and built-up area of the directly affected area and its surroundings, the role of the planned buildings and the BMW car plant to the south, the role of the main roads as a divider, the slope of the area, the prevailing wind direction from west to north-west, and the planned additional facilities in the North-West Economic Belt supplier park. With the highest density of species in the

the location and extent of habitats with a more favourable habitat status for wildlife was a factor be taken into account in determining the direction, focus and extent of the estimated overall wildlife impact area.

For the specific site, the most significant impact factors on the shape and extent of the estimated general habitat impact area, natural areas and habitats are noise, vibration, air emissions from the plant and traffic on access routes. The shape and extent of the estimated overall habitat impact area varies considerably for each of the different impact factors or agents. Actors will respond in very different ways to different drivers in different circumstances, but it is not realistic to define a specific area of influence for each potentially affected organism group or even for a species as a specific driver. For this reason, in defining the area of influence, we have tried to locate its centre of gravity and estimate the overall area of influence for the conservation of wildlife.

The area under study is located in the northern part of the originally intensive agricultural zone (arable land) and later industrial zone of Debrecen, in a typical agricultural area. The original condition and the industrial complex, as well as the high level of infrastructural development, were important considerations for the assessment of the impact on wildlife and the impact area. A decisive factor in the analysis of the wildlife impacts accompanying the operation of the plant is the completely degraded state of nature, as already explained above. The planning area itself and its immediate surroundings are therefore characterised by long-established habitats that are subject to severe and permanent disturbance and are completely degraded. The directly affected land will be set aside, with a planned significant proportion of built-up, paved plant surface, with biologically active surfaces of low naturalness and planned management, and will not be considered as semi-natural habitats in the future. After the establishment of the plant, arable farming will remain the dominant land use the surrounding area, with the appearance of facilities resulting from additional development planned in the North West Economic Belt Supplier Park. The green areas of the car park adjacent to the plant boundary are also unlikely to be developed in such a way that, over time, woody-shrub and tall fescue habitats of no conservation importance may develop, and therefore be of little significance as bird habitats in the long term, and can therefore be taken into account only marginally in determining the extent of the impact area.

29. Figure 1: Extent and direction of the planning area marked by the red boundary line and the estimated indirect area of influence for general wildlife conservation.

The focal point of the study area, i.e. the area of influence of the planned plant, is therefore located in a north-westerly direction relative to the centre of gravity of the area (

Figure 29). Of the emission sources that are the most important in determining the estimated impact area of the technologies used from a habitat conservation point of view, the most noteworthy are air emissions, noise and light. Therefore, the direct area of influence of the project from a nature conservation point of view coincides with the project area. For the most sensitive receptors, the maximum radius of the indirect impact area has been estimated to be approximately 1 km. The quality and quantity of the impact factors relevant for the impact on wildlife, as well as the limits of each factor, are determined by an environmental permit.

Expected impacts of the installation on wildlife and mitigation options

During construction, the topsoil on the land identified in the plans will be removed, together with the biota that has colonised it. No significant habitat changes will occur in the affected area as a result of the intervention, as it has at most a temporary weed flora due to its previous use. The very sparse vegetation in the planning area (immediate impact area) will be largely eliminated during the planting works. At most, micro-organisms, worms and other living in the deeper layers of the soil will survive the installation works. In the affected area, organism assemblages defined by a pioneer weed community will periodically colonise the disturbed surfaces.

Depending on the pace of the works, it is foreseeable that a number of temporary habitats may be created during the works, such as smaller larger pits that create waterlogged wetland habitats during wet weather. The upland heaps and the excessively steep gullies may be suitable for the breeding of hollow birds (shore swallows, gyrfalcons). Bird colonisation can be prevented by covering steep gullies that remain open for long periods during the breeding season. Steeper than 45°, there is a risk that hollow-roosting birds may colonise. If, for any reason, the gradual harrowing of the slope does not take place at this angle and the species of ratites become established, provision shall be made for their protection. In the latter case, the nature conservation authority may suspend work on the sites concerned until the end of the breeding season. In this case, within 10 to 10 metres of the nesting sites, from the start of the breeding season until the end of the breeding season
- between 15 April and 15 August - excavation and covering work is prohibited.

During construction, there will be no foreseeable sources of emissions other than those already mentioned that are likely to have an adverse effect on wildlife. Mitigation of adverse effects will be sought by using available methods (watering the area to prevent dust formation, using machinery of an appropriate technical standard, etc.). Any temporary dumping of materials, crossing, designation of a staging area or other use of the degraded grassland patches in the remote, out-of-area dry riverbeds associated with the project will be carried out in accordance with the organisational plans.

The proposed planting works will not endanger any protected or specially protected natural value of particular importance for the wider area and linked to the site and its surroundings. None of the species of Community importance, fauna or flora or their associations, on the basis of which the Natura 2000 sites in the wider area were designated, will be adversely affected by the construction of the project.

Expected impacts of the operation on wildlife and mitigation options

In relation to the operation of the industrial installation, the noise generated by the equipment necessary for the production technologies used and the spillage from the various plant technologies and production processes may be of relevance to the environment. The adverse effects associated with the production process are of non-negligible environmental importance. Given the natural conditions, the impacts on nature conservation and wildlife elements as agents of impact are predicted to be relatively mild under normal operating conditions. The exhalation valve of the storage tanks is connected to a central extraction system, which is discharged to the environment through a separation system, thus minimising potential environmental impacts. During the production process, aluminium and copper foil as well as cutting dusts are generated as cutting waste. The graphite, copper and aluminium foil strips and other solid contaminants are stored and moved in closed waste containers.

The industrial waste water generated is treated in a closed system. Wastewater from certain manufacturing processes and other procedures is treated in the plant's wastewater treatment plant and no contaminated water is discharged into the environment. The industrial waste water is treated in a system that does not allow it to have a harmful impact on surface and ground water and wildlife in the area under normal operating conditions. A separate network shall be provided for the on-site drainage of the planned waste water and stormwater. Within the planning area, separate networks shall be provided for urban waste water, process waste water, rainwater collected from roofs and paved surfaces.

The existence of the farm itself, built on intensive arable land in an agricultural environment, in addition to the impacts detailed above, is not expected to be a source of environmental-ecological factors of such a nature and intensity as to be of conservation significance in terms of the remaining and emerging wildlife in the estimated general area of wildlife conservation. Due to the current degraded natural state of the area of influence and its surroundings, no impacts or processes are expected that would affect the diversity of the wildlife in the area, its qualitative and quantitative composition or the conservation status of the higher nature values in the wider area. The grassed and mown areas and other landscaped areas of the site are completely excluded from the establishment and maintenance of higher diversity flora and fauna by the mechanical management methods used. Although the structure of the flora and fauna, which originally had a very low diversity and density in agro-biocoenoses, will change, habitats will become more stable and diversity may increase somewhat, the number of plant and animal species that will be able to withstand the effects of the treatment will remain extremely low. The perimeter of the site and its built-up area will inevitably create less favourable conditions for larger species such as birds and mammals, but the presence of larger animals in the operational area is not desirable anyway. It is possible that molting birds and possibly smoke voles may be present on the buildings. Pigeons of all species, in this case especially the homing pigeon and the homing pigeon, may also be present on the site and cause problems. The likelihood of bat infestation is very low. If a problem arises with a protected natural asset, it should be addressed by the nature conservation manager. The pigeon species mentioned are the responsibility of the person authorised to hunt in the area.

The adverse effects of light pollution on wildlife in the affected site or industrial environment in relation to night-time lighting are unlikely to be a particularly significant adverse effect. Nevertheless, it is desirable to design and use field lighting only to the extent necessary. Where necessary, the design and use of appropriate lighting installations and modes should such as to minimise adverse effects wildlife. In order to protect the natural night landscape and protected wildlife, in particular birds and night-flying insect species, the lighting of installations shall be designed to the minimum of the standard illumination (luminance) range strictly necessary for the safety of life and property, and shall be of the type that does not emit flux above the plane of the horizon and is fully shielded, with the lowest possible light output. It is also important to choose the quality of the light source in accordance with environmental considerations, e.g. use low-pressure sodium lamps or LED luminaires instead of halogen and compact fluorescent lamps, which are highly harmful to night-flying insects

Expected habitat conservation impacts of abandonment

If the function of the plant were to change in a way that would also cause an increase in environmental pressures, the change in the factors affecting wildlife will be defined in the statutory environmental permit procedure. In the event of closure of the activity and permanent or definitive decommissioning of the installation, provision will have to be made to prevent the release of stormwater and waste water, which are at increased risk of pollution, into the surrounding areas. The management of problems caused by protected animal species inhabiting the disused buildings shall be carried out with the involvement of the nature conservation manager, taking into account the applicable nature conservation legal standards. In the case of total abandonment, site restoration will require a separate planning and permitting process, including the definition of a landscape and nature conservation target status. The cessation or significant attenuation of intensive human impact on the site will provide an opportunity for the back-telepedaling. Only the establishment of native plant species is acceptable in possible reclamation interventions, but the foreseeable changes in pedological conditions, such as the concrete and asphalt layer covering the site or the contaminated and more rapidly drying soil, and the general living conditions, which are very different from the natural ones, make the chances of a rapid establishment of near-native communities of organisms very low. The biotic communities that have been planned and then spontaneously established on the abandoned site following reclamation are very different from the original communities. It is likely that the first species to colonise will be those that are commonly found in the altered structure of the area, tolerating relatively arid conditions, and which are mostly more typical of open or grassland habitats. If no closed stands of trees are established during the reclamation process, it is likely that the acacia and other adventitious species, which are widespread in the area, will become established due to the expected adverse environmental conditions. By restoring the original ploughing, the area will be restored to its pre-planting condition over time.

Impact factors, impact processes and agents expected to be affected due to a hazard

The extent and type of damage and disruption can have a significant impact on the impact on natural systems. If the disturbance only in the context of the activity at the plant site and is concentrated in an internal area, it is not expected to affect the natural values of the surrounding areas. In other cases where there are adverse effects outside the factory site, such as major fires or other pollution, there may be a risk of damage to natural values. In the event of a disaster and during the response and subsequent recovery, it cannot be excluded that damage may occur to natural areas of nature conservation importance in the wider area, which are not affected by the estimated overall wildlife impact area, in the event of distant normal operations. In the case of damage to nature conservation, the possibility of restoration, e.g. promoting natural regeneration, should be considered. In the case of major nature conservation problems, restoration may also require the involvement of the nature conservation manager.

In addition to the wastewater generated in the closed system, stormwater runoff from the plant site is also a negative impact factor. Harmful emissions can be expected in the case of extreme rainfall events that lead to a disaster situation in connection with stormwater. The adverse effects of stormwater drainage systems, designed and maintained in a closed system with appropriate environmental safeguards, can be significantly reduced.

Special technologies are available to deal with specific emergency situations related to certain manufacturing processes handling gas, liquid, hot oil or solids.

In summary, it can be concluded that during normal operation, no disturbance or accident is foreseeable that would result in significant or total destruction of elements of higher conservation importance in the living systems.

Cross-border impacts

It can be concluded that there are no transboundary landscape and nature conservation impacts resulting from the study area or the technologies used on the site.

7.5.3. Landscape aesthetic and conservation impacts of the existence and operation of the plant

7.5.3.1. Expected landscape aesthetic and conservation impacts of the development

The planned plant will be located in a flat, suburban area to the north of Debrecen, in an industrial zone to the west of the M35 motorway and to the north of the 33 main road. The BMW car plant, which is already under construction and will cover several hundred hectares, will have an aesthetic impact on the landscape in the vicinity of the residential areas belonging to the town, about 1,5 km from the outskirts of Józsa and 1,7 km from the boundary of the municipality of Nagymacs, covering a total area of about 45 ha. The area is separated from the settlement of Józsa by a busy motorway and from the outskirts of Debrecen by the main road and its surrounding hedges. From a landscape point of view, the landscape-like appearance of the works is also nuanced by intervening built structures, including the BMW plant. To the north and west, the site surroundedlargely open, mainly agricultural land, with the exception of the sparse trees and groups of trees remaining on the field margins, which are insignificant in this respect. The latter are of almost no landscape aesthetic importance, both in the vicinity of the site and in the surrounding fields of farmland. The very mature woody vegetation and young groves have little impact on the landscape. Apart from the factory halls and office buildings being built next to the planning area, there are no other features that stand out in the landscape. The semi-natural areas to the east are largely woodland in character and are an important element in breaking the monotony of the urban and agricultural landscape of the area. The latter, however, has little role to play in the new industrial area in terms of landscape protection. As a result of the works, the landscape character will be temporarily pronounced, as the ground surface will be levelled, which will involve relatively heavy excavation work. The installation works on the flat area, which is already free of woody vegetation, will add to the unnatural landscape character.

7.5.3.2. Expected landscape aesthetic and conservation impacts of the operation

Viewed from the east, south and south-east, the M35 motorway, the railway and the main transport routes, as well as the almost completed BMW factory buildings and the expected medium-high, large factory buildings in their background, will appear as a completely new and striking artistic element in the originally flat, open agricultural landscape (Figure 31), but will not represent a major change in complexity compared to the many similar objects already built. The facilities of the built-up industrial area will be mainly visible from the north. The industrial facilities, which will be built on a flat area and will not stand out from the surrounding area, will be new and significant landscape features in the flat agricultural landscape, visible from several kilometres away, mainly from the west, from the higher stretches of the Nagymacs and the motorway, which are not surroundedprotective fences (Figure 31). From a landscape aesthetic point of view, it is preferable that new facilities a landscaped strip or tree line, preferably or at least non-invasive species, mainly along their boundaries. A problem in the choice of tree species to be planted is that some species (e.g. conifers, hornbeam, etc.) grow very slowly due to unfavourable growing conditions and are easily affected by environmental stresses. A significant proportion of poorly selected planted trees are likely to dry out prematurely. In order to promote landscape aesthetics and protection, it is essential to create the best possible buffer zone and to regularly maintain the planted woody vegetation.

In terms of landscape morphology and landscape functions, the only significant high objects in this area, such as tall, mature, closed stands of trees and tree lines, are found along the railway and the main road from Debrecen to Balmazújváros. Also, the building complexes of the older built-up sites in the broad surroundings are remote and still relatively loose in structure, so that they are of no significance for the landscape appearance of the new building complex. The same can be said for the North-West Economic Belt on the ongoing or planned developments at the supplier park. The landscape the site, which is mainly located in an agglomeration, is mainly influenced by the presence of trees, which are largely absent in the area to the north. There is some screening by road and railway woodland to the east and south, but none to the north, and the morphology of the landscape does not obscure the landscape appearance of the new features. The relatively young and, at most, medium-height, poorly closed trees planted at the height of the buildings, when viewed from the higher sections of the motorway or from the ground surface, will provide almost no screening for the new plant complexes, which will be visible from several kilometres away.

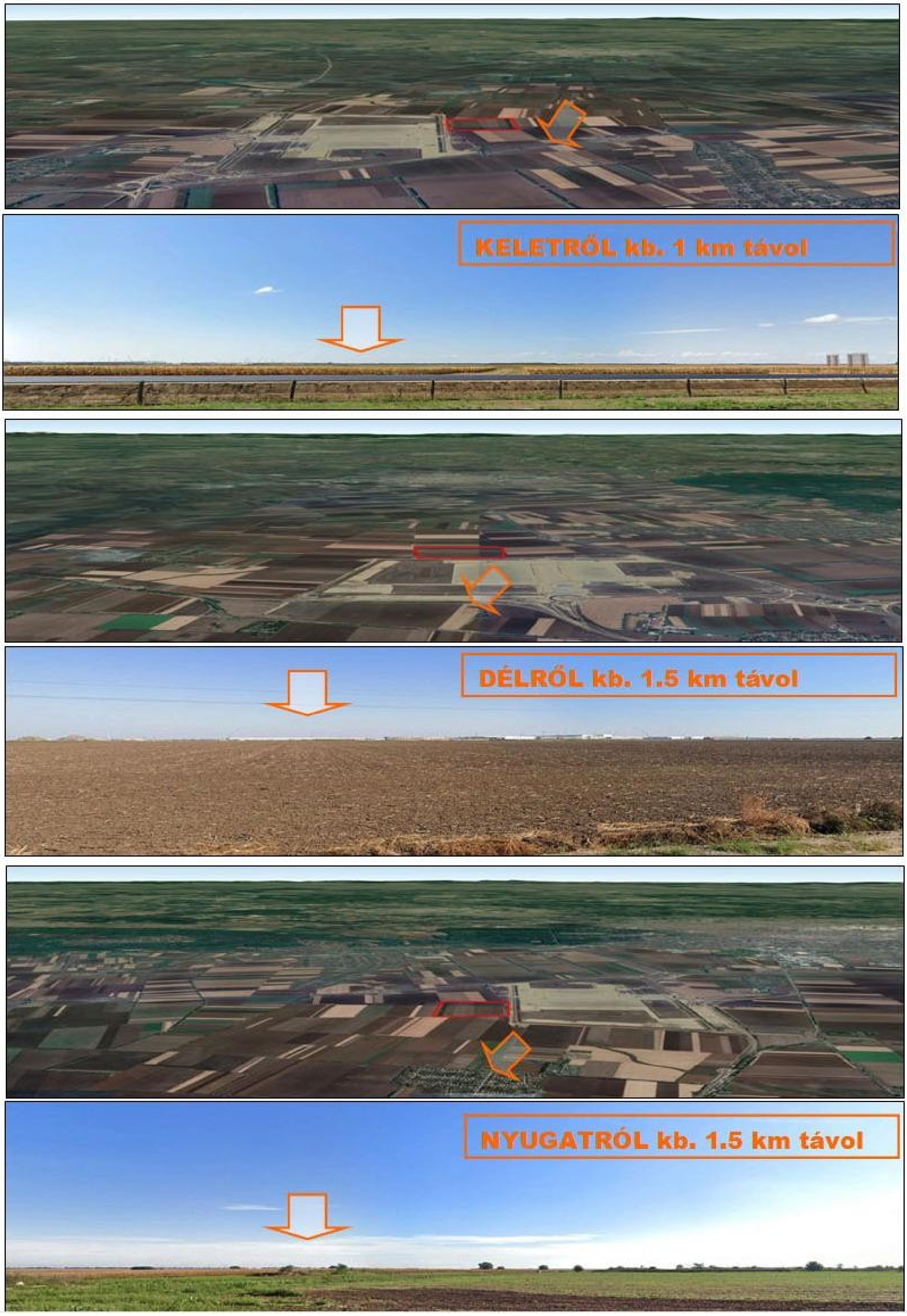
The mid-rise buildings, which are currently undeveloped and still open to the north and north-west, will be of considerable floor area and, together with the neighbouring halls already under construction, will be a striking feature on the horizon of the Nagymacs settlement. The change will result in a landscape aesthetic impact associated with a large increase in built-up areas, which will be inherent in the utilisation of the industrial zone that is gradually being built in.

Due to the natural and man-made landscape features described above, and in particular the screening of the motorway and roads, the new complex is only visible from a greater height in the south. With the appearance of the factory buildings, the landscape aesthetic will change from a distance to the north and will be conspicuous by the absence of intervening objects.

For the territory of the country as a protected landscape area in *Decree 9/2019 (VI. 14.) MvM*
this part of the administrative territory of Debrecen is not included in the zone.

30. Figure 3: Three-dimensional appearance of the factory buildings and the structure of the building and its landscape manifestation as seen from the southeast.

The plant units, of roughly the same building height and almost completely enclosed, appear as a single block in the landscape. In this respect, the planned protective planting on the boundary of the approximately 22 ha of land in the northern part of the site, which is still undeveloped, will only be of significance in time if at least one of the upper levels of the planted tree species is composed of tall trees with a strong influence on the aesthetic appearance of the landscape, such as white/grey poplar or holm oak (30).



31. Figure 2: Location of the planning area (red polygon) in the landscape, as seen from the SIDE, SOUTH and WEST (arrows point to the area and the location on the map where the photographs were taken.)

7.5.3.3. Expected landscape aesthetic and conservation impacts of abandonment

In the event of permanent abandonment, the neglect of the site could result in significant landscape aesthetic damage. In the eventual post-demolition reclamation, the reclamation site will be integrated into the surrounding area relatively quickly, thanks to the planting carried out the influx of vegetation from the surrounding areas. The reclamation area will be fully integrated into the landscape through full reclamation, grassing, afforestation or restoration of the original ploughing.

7.5.4. Protection of the environmental element or system concerned, change in its environmental, nature conservation or landscape functions

The competent nature conservation manager in the area concerned is the Hortobágy National Park Directorate, Debrecen.

The competent nature conservation authority is the Department of Environment and Nature Protection of the Hajdú-Bihar County Government Office, Debrecen.

There are no known stable populations of **protected natural values of** special conservation interest associated with the study area, its catchment area or its immediate surroundings. Species of high conservation importance or species of national importance and Natura 2000 sites designated the broad area are not expected to be affected by the environmental pressures associated with the establishment and subsequent operation of the plant, the technologies used and the impacts generated. Measures to protect protected or valuable species occurring in habitats outside the area of influence and, in particular, the action to be taken and the measures to be taken to minimise adverse effects in the event of a disaster or catastrophic event, will be specified in the environmental permit.

The Debrecen Great Forest Nature Reserve is **a protected natural area of national importance in** the Debrecen administrative area. The legislation declaring it protected is the *Decree 10/ 1992 (III. 25.) KTM.* Of the currently protected area of 1092 ha, an old pearl oak forest section was entered in the register of protected areas in 1939 with the serial number 1. Subsequently, in 1959, a further area of about 100 hectares was protected, which is originally a native pearl oak and hornbeam oak forest in this landscape. Since 1992 the entire area of the Great Forest has been protected. The western boundary of the area is more than 6 km away. This distance and the presence of intervening objects mean that there is no impact from the activity on the farm.

The inner area of the Debrecen Nagyerdő (urban) forest is **protected by local nature protection** under the General Assembly Decree 24/2006 (VIII.14.) of the Debrecen Municipality. Number of the act declaring it protected: Government Decree 26/1993 (VI.25.), registration number: 8/95/TT/93, protection category: nature conservation area, area: 50.60 hectares, year of entry into force: 1993.

The Tócó Valley Nature Reserve of Local Importance also enjoys local nature protection. It covers an area of 133.7 hectares, its register number is 94/8/TT/92, and the legislation declaring it protected is Government Decree 45/1992 (X.5.), Debrecen's only river in a relatively natural state is accompanied by mowing meadows interspersed with old willows.

Due to the distance and the intervening objects, the effects of the activity at the plant are not felt in local protected areas.

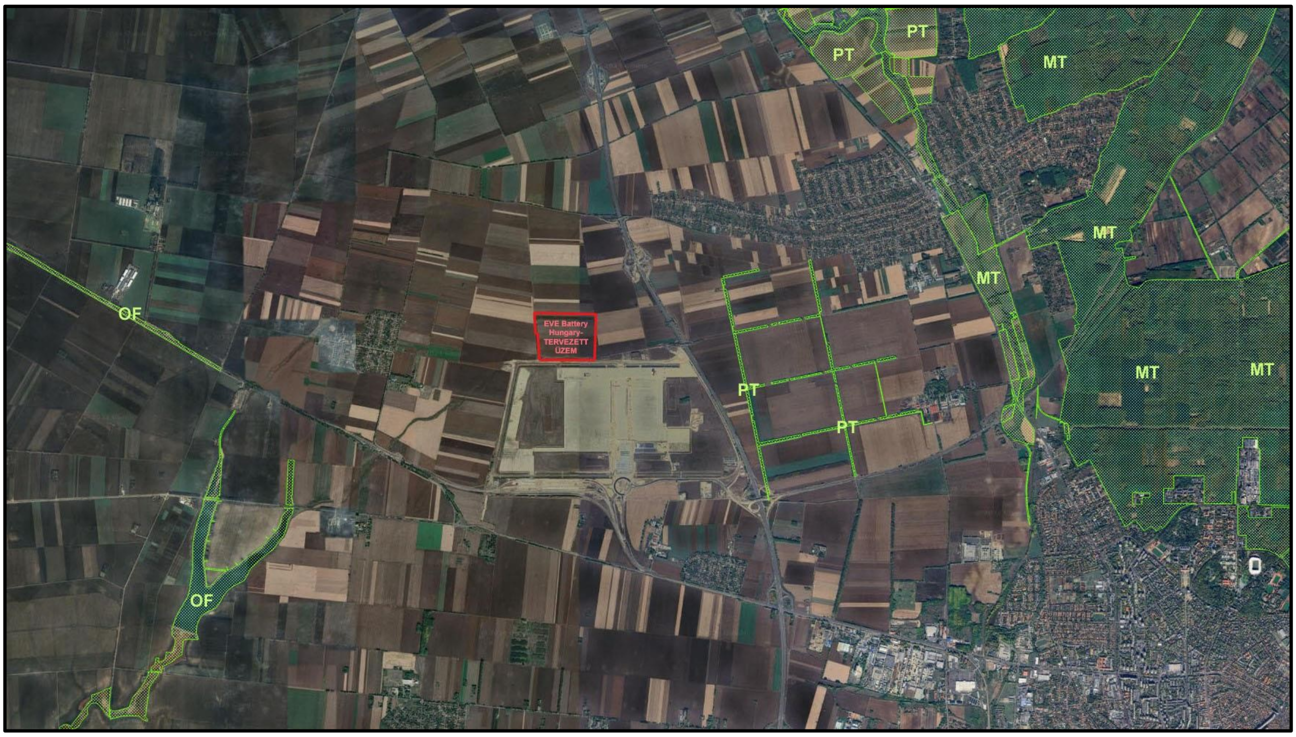
There are no marshes or other natural areas in the vicinity of the planning area that are considered as **ex-active protected natural areas or natural monuments** according to *Act LIII of 1996.* None of the known ex-legal sites and protected ponds in the municipality are located within the boundary area. Due to the distance and the intervening objects, the impact of the activities at the plant is not felt in the local protected areas.

32. Figure 1: Location of the planning area (box in red) and the Natura 2000 sites designated in the area.

The area in which the study area is located is not considered to be a
is part of the network of **high nature value areas** (HNVES), formerly known as sensitive natural areas.

According to the provisions of the Government Decree 275/2004 (8.X.) and the *Decree 45/2006 (8.XII.) of the Ministry of Agriculture, Forestry and Water Management,* the **European Community nature conservation areas, i.e. Natura 2000 areas,** designated in the vicinity of the area under study, are considered as special conservation areas of high priority under the Decree, the forested areas belonging to the Debrecen Nagyerdő (HUHN20033), located about 6 km away from the plant area. The Tócó valley, which is partly protected under local nature protection, falls into the same category as Tócó valley (HUHN20122), which starts about 4 km from the eastern boundary of the proposed plant area (Figure 32).

Natura 2000 sites start a considerable distance to the east of the study area. Due to the significant distance and the isolating role of the intervening sites, the activities at the plant are predicted to have a neutral impact on the natural state of the Natura 2000 sites and on the conservation status of the candidate species, subject to compliance with environmental rules. In case of emergency or disaster, it is possible to manage and minimise adverse impacts by respecting and enforcing environmental standards and rules.



33. Figure 1: The planning area (field outlined in red) and the designated elements of the National Ecological Network in the area (OF-ecological corridor,
MT-highland, PT-bufferland)

The elements of **the National Ecological Network, which** is intended to include the various protected areas and the natural and semi-natural habitats that remain outside them, have not been designated in the vicinity of the proposed plant (Figure 33). The impacts associated with the establishment and operation of the new plant are not expected to affect the functionality of the zones designated in the vicinity, which are mainly designated as ecological corridors and core areas. In the event of an emergency or disaster, it will still be possible to manage and minimise adverse impacts by complying with and enforcing the requirements and rules set out in the environmental permits.

7.5.5. Changes in settlement character (settlement image, settlement structure)

The investment area is located in a designated industrial park, where the development of the infrastructure and buildings is currently underway. To the south and east of the site there are already a number of industrial sites similar in size and appearance to the proposed investment. The plans show that the building will fit into the built environment and will have the characteristics of an industrial hall building, which are already prominent in the immediate surroundings. The proposed function is in line with the industrial use indicated in the regulatory plan.

7.6. Presentation of climate change impact processes and scope

The climate change assessment of the proposed investment presents the impact of the proposed investment on climate change, its contribution to climate change and the environmental risks associated with climate change. In order to identify the climate change impacts of the proposed investment, the sensitivity of the proposed activity and physical infrastructure to climate change impacts is assessed, and the exposure to natural hazards specific to the site of installation and the area of potential influence. Following the sensitivity and exposure analysis, a risk analysis was carried out for the identified hazards.

Finally, the impact of the proposed investment on the climate change resilience the hypothetical impact area is described.

7.6.1. A planned investment climate change against climate change climate change sensitivity analysis

The planned facility will be located in the North-West Economic Belt of Debrecen, which is currently under development, and its infrastructural development has been carried out in anticipation of the expected changes caused by climate change, thus ensuring the availability of transport links and utilities. The Permittee has no real impact on the status of transport links or climate adaptation beyond the planning area.

A sensitivity analysis was carried out for the proposed facility and its physical environment to assess the primary and secondary impacts of climate change on the proposed facility and its physical environment. According to the detailed guidance published by the Prime Minister's Office, the specific geographical location of the project does not need to be taken into account in the sensitivity analysis. In addition, it is noted that, as appropriate, the Central European and domestic realities were considered. Only the frequency with which a particular climatic parameter may occur, or even if it may occur at all, at the project site was considered in the exposure assessment.

We consider it necessary to carry out the sensitivity test for the parameters listed in the table below. The sensitivity of the proposed facility to changes in the weather parameter has been classified into 3 categories: 'low', 'medium' and 'high'. Climate change affects the changes in the weather parameters to different degrees, not all of which are parameters that pose a real threat to the condition and sustainability of the proposed investment. Changes in weather parameters that are not considered relevant for the proposed investment, such as an increase in dry periods without precipitation or a decrease in the number of frosty days, are not taken into account in the sensitivity analysis.

105. Table 3: Assessment of the proposed investment or activity and its sensitivity

Weather parameters and their variations	Sensitivity of the installation to changes in weather parameters and their (Building, mechanical systems)	Sensitivity of the immediate physical environment of the installation (utilities, paving) Enclosures
- **Windstorm,** - **An increase in the number and intensity of cloudbursts and stormy weather events.**	Medium	low
- Increase in average daily precipitation (average precipitation on wet days, mm/day)	Medium	Medium
- Slow decrease in average surface air temperature increase	Medium	Medium
Weather parameters and their variations	**Sensitivity of the installation to changes in weather parameters and their (Building, mechanical systems)**	**Sensitivity of the immediate physical environment of the installation (utilities, paving) Enclosures**

- **Increase in the number of heatwave days (daily mean temperature > 25°C),** - **Increase in the number of hot days (daily maximum > 30 °C)**		
- Fire damage (Forest fire frequency increase)	High	Medium
- **Increase in the frequency and intensity of flash floods** - **Increase in frequency and intensity of tidal waves** - **Increase in the frequency of run-off**	High	High

The sensitivity of the proposed activity and its associated planned infrastructure is high in terms of increased frequency flash floods, increased frequency of flooding, and increased frequency inland flooding. Heavy, intense rainfall events can cause intermittent localised flooding and can lead to persistently high levels of inland water in areas with no drainage. The accumulation of precipitation or stormwater can cause increased stress on the stormwater drainage system, possible damage to the stormwater drainage system and paved surfaces, and possible undercutting. The stability problems caused may also lead to a possible shutdown or suspension of production. A quantitative analysis of the durability of the building and associated physical infrastructure will be carried out by the architectural and infrastructure design professionals responsible for these issues.

In the context of the sensitivity analysis, it is emphasised that the geographical location of the investment area and the probability of occurrence of certain climate events should not be taken into account in the sensitivity analysis according to the Climate Risk Guidelines. In the sensitivity analysis, high sensitivities were identified for two weather parameters and their resulting events.

The sensitivity of the proposed facility to high incidence of forest fires. The proposed plant will store and use large quantities of flammable liquids and gases. A possible fire could cause serious damage to the proposed plant and its surroundings. It is noted that the proposed plant will be equipped with technical fire protection systems in compliance with fire safety regulations in order to reduce the fire risks. A quantitative analysis of the potential fire incidents related to fire safety has been carried out during the preparation of the safety report of the planned installation.

7.6.2. Exposure assessment of the installation taking into account climatic data for the past and the next 30 years

The exposure of the investment area is based on which of the sensitivity factors described above are likely to occur in the vicinity of the investment area. Only those weather parameters are considered for which the sensitivity of the investment has been shown to be medium or high.

The assessment is based on the data provided by the ClimateEU software, available free of charge at https://sites.ualberta.ca/~ahamann/data/climateeu.html, and conclusions are drawn below.

It should be stressed here that there are several sources of data, both domestic and EU and international, which in many cases differ in magnitude. We chose this software for two reasons:

- It is available free of charge, but is continuously updated by the development team.
- It provides location-specific data that is not available from other data sources.

The assessment analyses past and future changes in the following climatic data:

- monthly average temperature
- average monthly rainfall
- monthly average max. temperature
- monthly average min. temperature

In addition to the climateEU software, the OMSz (now HungaroMet) and the National Adaptation Centre NATEU database were also taken into account as a source of information. Based on the NATéR database, we consider the changes of the following weather parameters:

- Increase in the number and intensity of windstorms, downpours and severe weather events.
- Increase in the number of heatwave days (daily mean temperature > 25 °C), Increase in the number of heatwave days (daily maximum > 30 °C)

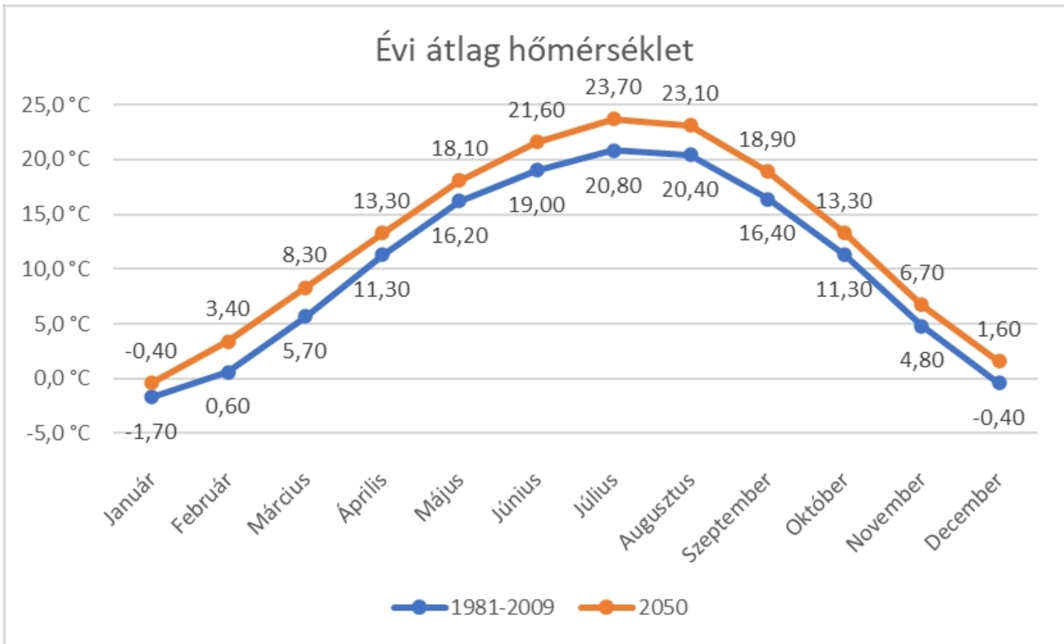
It is noted that, according to the Khvr. legislation, the future period under consideration is the next 30 years. The NAGR database provides information on the period 2021 to 2050 and the period 2070 to 2100. We have first considered model results for the period 2021 to 2050. For the first 4 years of the period 2050 to 2070 up to 2054 (in order to complete 30 years to be considered under Annex 6, point 3 of the LR), we interpret the results of the previous period considered. It is therefore noted that in the following chapters, the trend for the period under examination, from 2021 to 2050, is also proportionally true for the period from 2050 to 2054. As an outlook, we also mention in some cases the model results for the period 2070-2100.

By reviewing other relevant sources, the following weather parameters and the exposure to events resulting from changes in weather parameters were investigated:

- Fire damage (Increase in the frequency of forest fires)
- Increase in the frequency and intensity of flash floods, increase in the frequency and intensity of tidal surges, increase in the frequency of inland flooding.

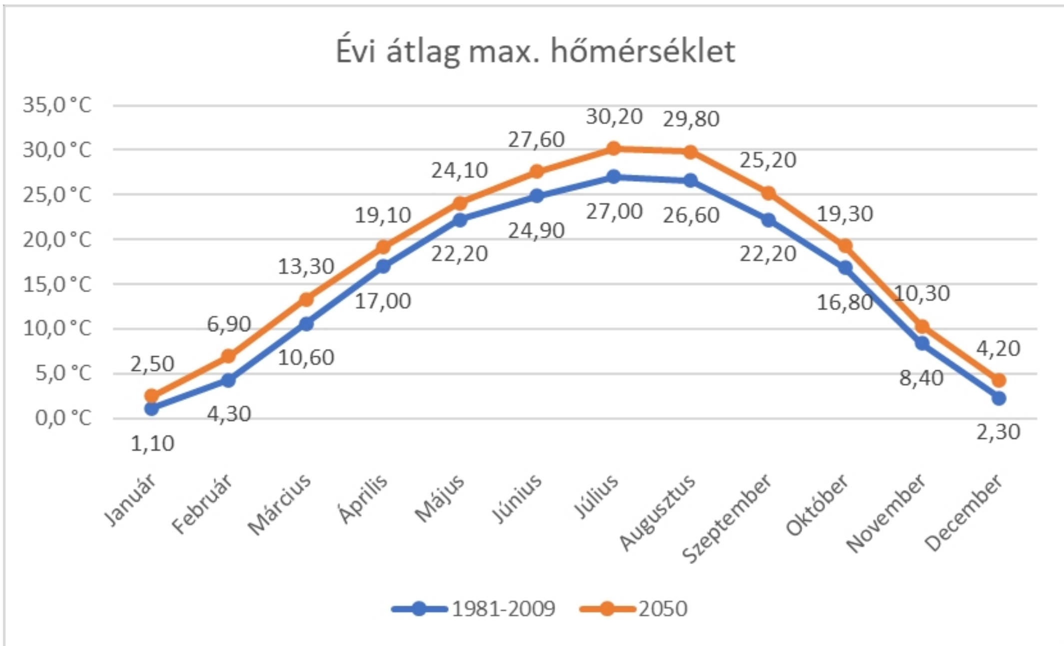
7.6.2.1. Increase in average surface temperatures, more frequent heat waves and hot days

The changes in the annual mean temperature in the area are illustrated in the diagram below. It clearly shows that there is a general warming trend. The largest increase is seen in August, with an increase of 2.7°C. The average annual temperature for the period 1981-2009 is 10.4°C, while the modelling for 2050 is 12.6°C. This represents an average temperature increase of 2.2°C over the period considered. Global ambition is to keep this below 2°C compared to pre-industrial levels.



34. Figure 1: Average annual mean temperature for 1981-2009 and 2050

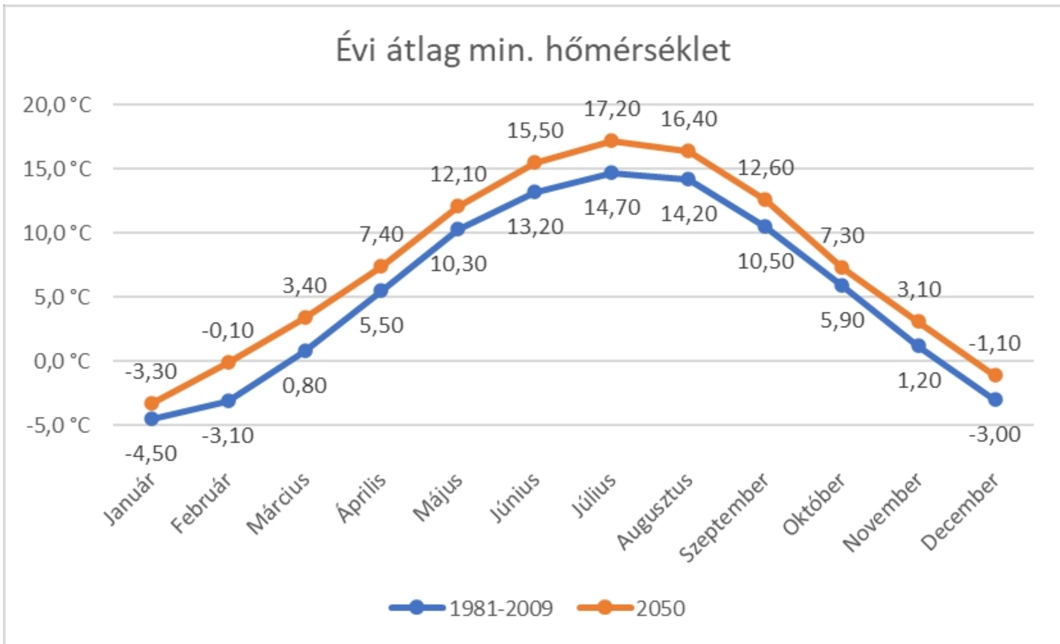
Annual average maximum temperature



35. Figure 1: Annual maximum mean temperature for 1981-2009 and 2050

The variation of the annual average maximum temperature in the area is illustrated in the diagram above. It clearly shows a general warming trend over the year. A more pronounced increase is observed in the February - March and July - September intervals. The largest change occurs in July and August, with an increase of 3.2°C in 2050. The average annual maximum temperature for the period 1981-2009 is 15.3°C, while the modelling for 2050 is 17.7°C. This represents an average maximum temperature increase of 2.4°C over the period considered.

Average minimum annual temperature



36. Figure 1: Minimum mean annual average temperature for 1981-2009 and 2050

The variation of the average annual minimum temperature in the area is illustrated in the diagram above. It clearly shows that there is a general warming trend. A strong increase is observed in the February-March period. The largest change occurs in February, with an absolute increase of 2.6°C in 2050. The average annual minimum temperature for the period 1981-2009 is 5.5°C, while the modelling for 2050 is 7.5°C. This translates into an average minimum temperature increase of 2.0°C over the period considered.

Frequency of heatwave and heatwave days

Days when the daily mean temperature is 25 °C or more are called heatwave days. According to the NATéR database, the variation in the number of heatwave days at sub-regional level is significant in the sub-region of Debrecen. The increase will be about 90% in the period 2021-2050 compared to the base period.

The exposure of the study area to heat waves and heat can also be assessed by the variation in the number of hot days in the NATE database. Based on the ALADIN Climate climate model, an average of 10 to 15 hot days can be expected in Debrecen and its surroundings for the period 2021 to 2050. Compared to the baseline period, the expected change in the number of hot days in the period from 2071 to 2100 is 25-30 days.

The exposure of the region to heat waves, and the results of studies on excess mortality due to heat waves, are also intended to show the exposure of the region to heat waves, for which an informative map broken down by districts is available in the NATéR system. The exposure of the Debrecen district to heat waves is medium in terms of excess mortality studies, due to the age composition of the population or the general health status.

7.6.2.2. Increase in intensity of stormy weather events - gusts, windstorms

The Building Vulnerability layer of the NATéR database provides information on the exposure of the region to wind storms. The indicator shows the change in the average number of days per year affected by wind gusts above 85 km/h. For the period from 2021 to 2050, the change in the average annual number of days affected by Windstorm, Severe Windstorm, Hurricane (gusts exceeding 85 km/h) is 0.3 days compared to the reference period 1971-2000, which represents ~8 days until 2050. This value is slightly above the national average. The project area is therefore moderately exposed to storm events.

7.6.2.3. Increase in the number and intensity of stormy weather events - Downpours

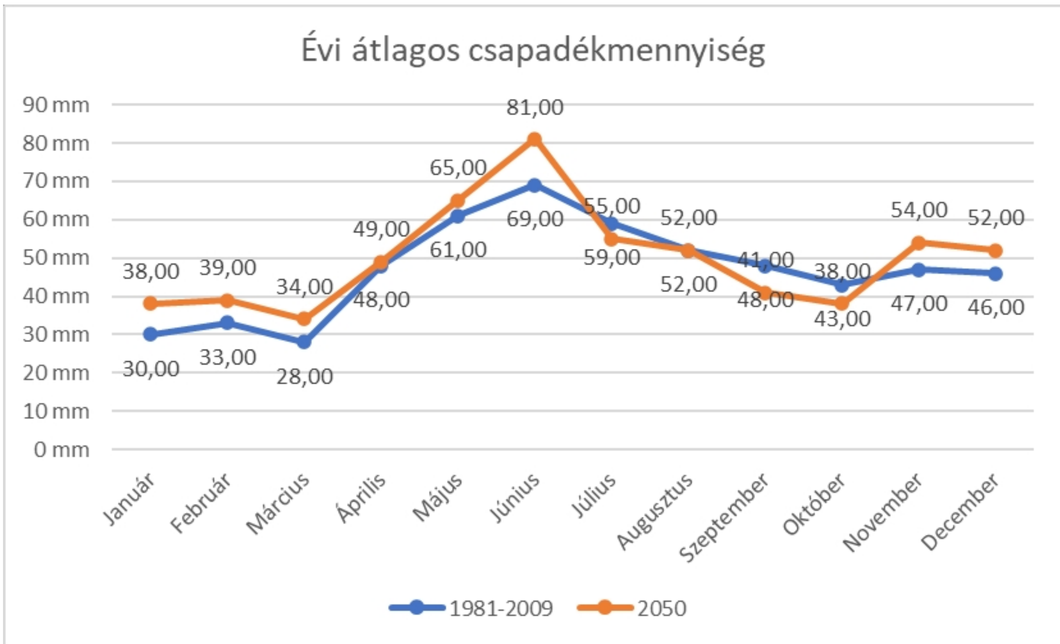
For cloudburst or intense precipitation events, the extent to which the investment area is exposed to the expected change in the number of precipitation days exceeding 30 mm over the period 2021 to 2050 was assessed using the ALADIN-Climate climate model. According to the NATéR database, the increment is 0- 0.5 days per year, which is a smaller increment compared to the national average. It can be concluded that the study area is moderately exposed to the expected change in the number of precipitation days exceeding 30 mm.

7.6.2.4. Increase in average daily precipitation (average precipitation on wet days, mm/day)

There is considerable variation in the increase in average daily precipitation within Hungary, with parts of the country showing a decrease or an increase in average precipitation on precipitation days compared to the baseline period from 1971 to 2000. The NAGRE database provides information on the variation of daily precipitation intensity on a seasonal basis. For the period 2021 to 2050, the autumn and winter precipitation intensity changes show an increase of 0-1 mm/day, while the spring and summer precipitation intensity changes show a decrease of 0-1 mm/day. This indicates that Debrecen and its region are slightly exposed to an increase in average daily precipitation.

With regard to the variation of the annual average rainfall, the following observations were made.

Average annual rainfall



37. Figure 1: Average annual rainfall for 1981-2009 and 2050

The variations in the average annual rainfall in the area are illustrated in the diagram above. It can be clearly seen that a very variable situation is expected over the course of the year. An increase is observed in the November-March period. In contrast, less precipitation is expected in the July-October period the future period. The largest change occurs in the month of June, with an increase of 12 mm in 2050. The average annual precipitation for the period 1981-2009 is 47.0 mm, while the modelling for 2050 is 49.8 mm. This represents an average increase in rainfall of 2.8 mm over the period studied.

Rainfall in the area for the period 1981-2009 was 564 mm/year. Based on the modelling of the
By 2050, this will change to 598 mm/year. Fire risk

(increase in forest fire frequency)

The NAG database does not contain information the exposure of the study area to forest fires. It is noted that there are no forest areas at risk of fire in the immediate vicinity of the project area.

According to the forest fire protection plan of Hajdú-Bihar county, the forests in the county are basically classified as low fire risk forest areas.

7.6.2.5. Increasing frequency and intensity of flash floods

The NAG database does not indicate a flash flood risk for the area. This is due, among other things, to the fact that the project area is located in a lowland area, which, due to its flat terrain and the absence of watercourses, does not have the geographical parameters necessary for flash floods to occur. The investment area is therefore not exposed to flash flood risk.

7.6.2.6. Increase in frequency and intensity of tidal waves

The Tisza is the most watercourse in the vicinity of the planning area, to the west of it. The planning area is not considered to be a potentially vulnerable area for floodplain bays, based on a 1000-year average. According to the Flood Risk Assessment Plan, there are additional floodplains in the southern part of Hajdú-Bihar County, connected to the Berettyó, but these are also located south of the project area, far from the project area.

It can be stated that the planning area is not at risk of flooding.

7.6.2.7. Increase in the frequency of run-off

The investment area is located in the north-eastern part of the Great Plain, in a typically flat area with drainage conditions suitable for the development of inland water. In addition to geographical conditions, inland water can be caused by rising groundwater levels, prolonged periods of precipitation or even snowmelt.

Currently, the groundwater at the site is between 3 and 5 m at rest, as observed during baseline measurements. It is noted that there is a significant variation in the surface elevation between the northern and southern parts of the site. According to the groundwater level map of the Hungarian Mining and Geological Survey, the groundwater table below the project area is between 4 and 8 metres.

For the future period from 2021 to 2050, in terms of groundwater level differences compared to the present, the most optimistic estimate is that the groundwater level will not decrease or will decrease only slightly (0.5 m), in the worst case by 0.5-1 m below the present groundwater level. In addition to the average decrease in groundwater levels, an increase in the intensity of individual precipitation events is expected, according to the NAGR , which will have a negative impact on the probability of inland water events. Nevertheless, it can be concluded that the project area is exposed to a medium to low risk of inland water events in the future.

7.6.2.8. Summary evaluation of the exposure assessment

The exposure assessment is summarised in the table below. As with the sensitivity test, the assessment used low, medium and high grades.

106. Table 3: Summary assessment of the exposure assessment

Weather parameters and their variations	Exposure of the investment area
- Windstorm, **- An increase in the number and intensity of cloudbursts and stormy weather events.**	Medium
- Increase in average daily precipitation (average precipitation on wet days, mm/day)	Medium
- Slow increase in average surface air temperature **- Increase in the number of heatwave days (daily mean temperature > 25°C),** **- Increase in the number of hot days (daily maximum > 30 °C)**	Medium
Weather parameters and their variations	**Exposure of the investment area**
- Fire damage (Forest fire frequency increase)	Low

- **Increase in the frequency and intensity of flash floods** - **Increase in frequency and intensity of tidal waves** - **Frequency of occurrence of groundwater increase**	Low

7.6.2.9. Vulnerability analysis, assessment of potential impacts

In the table below, the vulnerability of the investment has been determined based on the sensitivity analysis and exposure assessment for each climate factor. Only those climatic parameters and their consequences for which the sensitivity or exposure was found to be medium or high are summarised here, since according to Annex 6 (dc) of Decree 314/2005, only those parameters where the exposure or sensitivity was found to be significant need to be taken into account.

107. Table 3: Assessment of potential climate impacts (vulnerability)

Exposure

		low	**Medium**	**high**
Sensitivity	**low**			
	Medium		Increase in the number and intensity of windstorms, cloudbursts and severe weather events. Increase in average daily precipitation (average precipitation on wet days, mm/day) Slow increase in average surface air temperature, Increase in the number of heatwave days (daily mean temperature > 25 °C), Increase in the number of hot days (daily maximum > 30 °C)	
	high	The frequency and intensity of flash floods an increase in the intensity of, Increase in frequency and intensity of tidal waves, Watershed formation increase in the frequency of Fire damage (Forest fires an increase in the frequency of)		

7.6.3. Risk assessment for each climatic factor

Table 108 assesses the probability of occurrence of each weather event and also gives the magnitude of the associated consequences. Future changes in each weather event and sub-event are also shown in the table.

The categories used are described below.

Probability:

Probability	Result		
	Small (1)	**Moderate (2)**	**Significant (3)**
Frequent (3)	Low (3)	Medium (6)	High (9)
Possible (2)	Low (2)	Medium (4)	Medium (6)
Rare (1)	Low (1)	Low (2)	Low (3)

Rare: Occurs only in exceptional cases.

Possible: could occur in the near future or within the lifetime of the installation (within 5 years).

Frequent: Highly likely to occur in the near future or within the lifetime of the installation (within 1 year).

Consequences:

Small: Minor damage, no major impact on the environment or the facility. No or minimal material damage.

Moderate: Causes visible damage to the environment or the installation. Physical damage to the facility may occur, which may require major financial costs to repair.

Significant: serious damage is caused to both the natural and built environment. The cost of repair work is very high.

108. Table 1: Risk assessment for each weather event

Event	Bottom line (future change)	Probability	Result	Available at Impact/Risk	Proposed intervention (adaptation measures)
The number of stormy weather events and increase in intensity	**Increase in the number and intensity of windstorms**	3	2	6	Stormy weather may cause disruptions to utility services and the transport of goods related to production. During extreme storms, greater attention should be paid to sudden large rainfall events and their drainage through the proper sizing of stormwater collection and conveyance systems.
	Intense precipitation	3	2	6	
	Average daily increase in precipitation	3	2	6	
Extreme temperatures	**Surface air slow increase in average temperatures**	3	2	6	By properly sizing the cooling system for peak loads, it is possible to prepare for temperature extremes and anomalies. An increase in cooling demand and a change in the number and length of hot spells could lead to a temporary increase in the cooling water demand of the installation, which has been avoided by setting the cooling demand with an appropriate safety margin. the increase in average temperatures and the number of heat-wave days may also increase the need for irrigation of green areas. Buildings should be fitted with increased thermal insulation, which can minimise energy demand and improve the thermal comfort of those working in the building. Not only the physical environment, but also workers are affected by the prolonged heat, heatwaves and heat shock. This is when the legislation on health and safety at work and guidelines are recommended for the benefit of people working during a heatwave.
	Increase in the number of heatwave and hot days	3	2	6	
Firefly	**Forest fires an increase in the frequency of**	1	3	3	In order to minimise the expected effects of fire damage, compliance with fire safety regulations and the observance of safety distances are recommended. Fire hazard forests as defined in the relevant chapter of the facility are not found in the immediate vicinity.

Event	Down event (future change)	Probability	Result	Available at Impact/Risk	Proposed intervention (adaptation measures)
Floods	**Flash flood occurrence an increase in the frequency and intensity of**	1	3	3	There is no watercourse in the vicinity of the project area that could pose a real risk of flash flooding. The geographical location of the project area is not ideal for flash flooding.
	Tidal waves an increase in the frequency and intensity of	1	3	3	There are no surface watercourses of real risk in the vicinity of the site, so no additional intervention is justified.
Belvíz	**Increase in the frequency of run-off**	1	2	2	The groundwater table in the area is 4-8 m below ground level, while the maximum groundwater table is expected to be 3.2 m below ground level based on soil mechanics expertise. With the construction of the pavement and the collection of rainwater in a closed system, the rate of recharge from the ground will be reduced during operation. Climate change will cause a long-term decline in the at-rest groundwater table. More intense precipitation caused by climate change no real risk of inland flooding is expected in the planning area, even taking into account additional impacts

7.6.4. Analysis of possible impacts

In the table below, an analysis of the potential impacts the physical infrastructure has been carried out, taking into account the impact of changes in each climatic parameter on the planned buildings, mechanical systems, utilities and outdoor pavements.

109. Table 1: Potential impacts of changes in some climate parameters

	Building	**Mechanical systems**	**Public utilities**	**Enclosures**
Windstorm, downpour, stormy weather events increase in intensity	No impact is assumed if the wind load is properly sized. The significant rainfall intensity of the can cause damage to the roof structure. Mechanical systems outside the building could be damaged in the event of a hailstorm.		In the event of intense rainfall, the pavement may be washed away, which can lead to can also cause damage to utilities. The risk can be reduced by designing an appropriate stormwater drainage system. -	
Heat wave, number of hot days increase.	-	Overloading of mechanical systems can happen.	-	Damage to the outdoor envelope in case of prolonged heat, heat wave can .
Firefly	Fire damage can cause serious damage to the building and the equipment associated with its operation in engineering systems.		-	-
Floods, flash floods	In the event of water entering the building, the building structure may be damaged.	For tank farms, the high groundwater levels may present a risk.	A utility with structural damage, leaching, unprotected electrical Equipment may be damaged.	Leaching or flooding of coverings.
Belvíz				

7.6.5. Proposals for specific climatic factors

During design, construction and operation, it is important to take environmental variables into account. Steps taken early in the design process can go a long way to ensuring that changing climatic conditions have minimal impact on the installation.

Further proposals are described in the relevant summary chapter (chapter 7.6.5).

To monitor the adaptation of the investment area, the following measures are proposed:

- carrying out regular and thorough maintenance of the physical infrastructure, including the surrounding pavements, utility system elements and the building and its mechanical systems.
- Good maintenance of the green surfaces in the investment area, possible increase in diversity, further greening and planting of the future development area.
- To improve worker comfort during a heatwave, it is recommended to worker comfort during a heatwave, in addition to the mandatory health and safety requirements.

7.6.6. Climate change impact assessment of the proposed installation

The use of the area will change as a result of the project, and the character and appearance of the area will also be greatly altered.

The construction and operation of the proposed facility will result in greenhouse gas (GHG) emissions, which are described in more detail in the next chapter. In order to reduce GHG emissions associated with electricity use, the installation of a solar PV system at the site is planned.

Open cooling towers use water to cool systems through evaporation. This leads to water vapour emissions and increased water consumption, which can affect local water supplies. To avoid this, the cooling towers are planned to be operated using treated grey water, which is the treated wastewater planned to be supplied by Debreceni Vízmű Zrt. (The permit applicant will investigate the feasibility of using precipitation water to provide the cooling towers' make-up water needs.)

In order to reduce the thermal load of the effluent discharged from the installation, the temperature of the effluent that the applicant intends to discharge will fall within the range 12-25 °C. As explained in Section 7.1.3.5, the amount of air pollutants potentially emitted from the cooling towers is negligible and the magnitude of the expected impacts on climate change is therefore not expected to be significant.

Battery production can contribute to mitigating climate change by helping to improve the efficiency of energy storage and the uptake of renewable energy sources and electric vehicles.

Infrastructural improvements being implemented develop the industrial parks in Debrecen and to provide energy and utilities to the planned facilities, so the planned development is not expected to affect the access of the surrounding population to energy sources. The use of potable water for the facility will be minimised as far as possible (less than 2% of the total water use is potable). The investment has the potential to improve the financial situation of the local municipality through increasing the local income generating capacity and, indirectly, the local adaptive potential.

7.6.6.1. Impact of the proposed activity on the adaptive capacity of the area of influence

The proposed battery plant will have no significant impact on the adaptation, improvement or degradation of the environment to climate change.

The investment will not affect the adaptation objective of the city of Debrecen to avoid the adverse human impacts of heat waves. It is noted that the project has the potential to improve the city's capacity to generate income, which could indirectly have a positive impact on the quality of public services, which could also ensure the provision of services to the more heat wave-sensitive social groups.

The project will not affect the climate resilience of the surrounding industrial installations that will be built in the area.

The project will have no impact on the local water management of the area, and clean or treated stormwater falling on the project area will be collected in a separated system within the area. There will be no abstraction from natural watercourses or groundwater. It is noted that, although the plant will not have a global climate change impact, the large amounts of water vapour released will have a local impact on atmospheric processes, leading to excess cloud formation, which may alter the microclimate of the city.

The urban thermal insulation effect can be increased thanks to the appearance of new, previously unpaved surfaces. Although the size of the green spaces will be reduced, their quality is expected to improve due to the introduction of several levels of vegetation.

7.6.7. Greenhouse effect gases expected emissions - annual and tonnes - supported by calculations

The construction and operation of the facility will result in greenhouse gas (GHG) emissions.

This quantified by the carbon footprint of the building materials at the time of construction and the emissions from diesel-powered construction equipment, which are orders of magnitude lower than the carbon that is incorporated.

For the estimation of the carbon footprint, the values of material use given in the design data were taken into account. It should be noted that only quantitative information was available for the materials included in the data supply, no qualitative information was available, so their quality and nature was estimated based on previous experience of carbon footprint calculations for similar industrial halls or ignored in the calculation. All GHGs in the calculation are expressed and converted to $_{CO2}$ equivalent.

Of the materials used in construction, steel and concrete have the highest $_{CO2}$ equivalent, mainly because of the quantities used. For the calculation of the carbon footprint of the building materials, a life cycle of 50 years is assumed for the building. The $_{CO2}$ equivalents for the materials used were determined using the One Click LCA database. The emissions and embodied carbon for the construction of the project are given in the table below.

110. Table 1: Calculated GHG emissions from the construction of the facility

Categories	**GHG emissions ($_{CO2}$ eq.)**
Building materials used	134 135 t CO2e
Transport related to construction materials	1 473 t CO2e
Building / construction works	15 614 t CO2e

For the transport of building materials, One Click LCA software uses average values, depending on the typical and average distance from which building materials can be sourced in Hungary. Thus, although the supply routes of building materials are not known, the overall carbon footprint of transport can be approximated.

(Please note that the estimated installed carbon footprint is not a validated calculation, a full carbon footprint calculation and life cycle analysis of the entire investment is proposed to be carried out as the project progresses, involving a sustainability expert team in a separate project.)

The operation of the installation, and consequently the greenhouse gas emissions, consists of:

- $_{CO2}$ emissions from natural gas use (SCOPE 1)
- Greenhouse gas emissions from refrigerant and shielding gas ($_{SF6}$) leakage (SCOPE 1)
- Leveraged emissions from electricity use (SCOPE 2)

The CO_2 equivalents of drinking water, industrial dilution water and grey water consumption were also taken into account. The SCOPE 1 and SCOPE 2 terminologies are terms used to distinguish between direct and indirect emissions when calculating corporate greenhouse gas emissions.

Of the above, it is not possible to determine emissions from refrigerant and shielding gas leakage at this stage. CO_2 emissions related to natural gas use can be calculated also by taking into account Annex 5 of Government Decree 410/2012 (28.XII.), here and below we have relied on the calculations of the One Click LCA software. Based on the planned electricity, natural gas and drinking water consumption of the plant and the amount of shielding gas (SF_6) of the transformers planned to be installed at the substation, the annual direct and indirect greenhouse gas emissions of the plant can be calculated as follows:

111. Table 1: Calculated GHG emissions during the operation of the installation

Categories	GHG emissions (CO_2 eq.)
Drinking water	81 t CO2e
Industrial dilution water	600 t CO2e
Greywater	386 t CO2e
Natural gas	107 342 t CO2e
Electricity*	143 720 t CO2e
SF_6	11 950 t CO2e
Total annual calculated emissions	**264 079 t CO2e**

Note that the calculated result depends on the actual calorific value of the natural gas used on the site. It should also be stressed that the SF_6 shielding gas planned to be installed and used at the substation is not refillable during normal operation. A detector is planned to be installed to detect any gas leakage.

It is also noted that the carbon footprint of electricity depends on the current domestic energy mix and method and location of electricity generation purchased. For our calculations, we used the One Click LCA software's 2021 carbon intensity value derived from the Hungarian energy mix, which is 0.28 $kgCO_2eq/kWh$.

As described in section 4.13, solar panels are planned to be installed on the roofs of each building and on separate racking in the car parks to reduce the GHG emissions of the facility. The placement of the solar panels is ideal as they do not green space but are installed on an paved surface, on a structure that can provide shading. The amount of electricity that can be generated by the planned solar panels is estimated at 13 445 MWh/year. As the amount produced can be fully utilised in the technology, the CO_2 emissions associated with electricity use will be reduced proportionally, which has already been taken into account in the calculation of the global warming potential of electricity in the above table.

The total CO_2 emissions are calculated for a one-year period, taking into account the full capacity of the production. The total annual calculated GHG emissions of the plant are therefore 264 079 tCO2e.

7.6.7.1. Demonstration of possible adaptation measures and measures to reduce or offset greenhouse gas emissions that are beneficial from a climate, ecological and environmental point of view and that do not entail disproportionate costs

Several engineering concepts have been developed to reduce CO_2 emissions from the facility. As part of this, the installation of a solar PV system is planned, as described above.

To transport our workers to the planned factory, the investor plans to introduce bus services, reducing the use of private cars. A bicycle storage facility is also planned to promote micromobility. Accessibility from the city of Debrecen was an important factor in the choice of the location of the planned facility.

The applicant is aiming for a CO_2 neutral operation, so it is planned to purchase carbon credits to offset the carbon dioxide emissions of the operation before the start of operation. It is noted that the purchase of carbon credits is sufficient in the long term, but does not contribute to reducing the plant's emissions, so it is important that future planned technological improvements should not only aim at increasing efficiency, but also at reducing CO_2 emissions. To this end, for example, if gas boilers were to replaced, it is proposed to install electrical equipment (e.g. heat pumps) where technology allows. It is noted that the price of the carbon quota is increasing every year, so that its purchase is becoming an increasing cost for the investor.

The choice of the right building insulation is a critical parameter in the design of the project, so the possible alternatives were carefully considered.

The choice of appropriate vegetation is important for the green areas planned for the site. Intensive grassland is not recommended, but extensive green areas are. Extensive green areas do not need to be irrigated, and trees and shrubs that are planted should only be irrigated to their initial stages (the first 2-3 years), thus reducing the water demand on the site's environment and thus indirect greenhouse gas emissions.

Keeping rainwater falling on the site in the area is also an objective. The Developer will investigate the feasibility of using stormwater to provide the cooling towers with make-up water. In addition, if the rainwater is of sufficient purity, it is proposed to use it for irrigation purposes in the field.

To partially offset the GHG emissions of the factory, the Permittee will take on-site and off-site measures. On-site energy efficiency measures (lighting in production areas, building and hall heating), technological innovations and climate-related technological improvements, tree planting (134 new saplings), bicycle storage facilities and changing rooms and showers for workers arriving by bicycle are planned to promote climate-friendly transport modes. As an off-site measure, the factory will partially offset its GHG emissions by organising energy-efficient and climate-friendly bus shuttles for workers and by purchasing carbon credits.

Among the emissions avoided, the choice of the location of the factory should be listed as a consideration. An important pillar of the siting and design was to locate the plant in the immediate vicinity of the user and consumer of the batteries produced here, which, in addition to the manufacturing and technical aspects, would have a significant impact on the transport and shortening logistics routes, thus shortening the product's transport route and thus reducing transport emissions.

7.6.7.2. A demonstration, supported by calculations, of how the proposed activity will affect greenhouse gas sequestration or absorption by vegetation

According to data from the European Environment Agency, Hungary's total net greenhouse gas emissions from agricultural activity are 6213.16 kt $_{CO2e}$ (2022 data). This includes arable land, orchards, vineyards and grassland. In Hungary, in 2022, there were 4173.2 thousand hectares of arable land, almost half of the total agricultural area. The carbon footprint of intensively cultivated arable land is positive, i.e. cultivation leads to higher emissions than it absorbs.

According to the information provided by the planners, the area is planned to be planted with tree species that are native to the nearby Debrecen Great Forest. The planting of tree seedlings and the creation of an extensive green area should aim at planting alternatives in terms of species that provide greater constraints than were possible in the previous land use. Based on currently approved landscape plans, 134 trees are planned to be planted on the site, with a carbon sequestration of ~25 kg/year/individual. It is noted that the carbon sequestration of trees is highly dependent on weather factors, soil, and tree age. If we consider a future 50-year period, the total $_{CO2}$ sequestration of 134 trees will be able to sequester 167 500 kg of carbon dioxide.

The proposed project will have no impact on the greenhouse gas sequestration capacity of surrounding vegetation outside its own site boundary.

Battery production, as a planned activity, will have no impact on the greenhouse gas sequestration capacity of the project site and its immediate surroundings, nor on the absorption of greenhouse gases by vegetation.

7.6.8. Variance analysis

From a climate protection, climate adaptation point of view, a two-way analysis of variants is possible:

- A planned facility design various in different locations what climatic effects, considerations may have
- Whether the impact of the installation on the site is significant from a climate change perspective, and how the impacts of climate change on the installation can be adapted to the site.

For the present project, it was not possible to examine several sites that were geographically significantly different from each other, as follows:

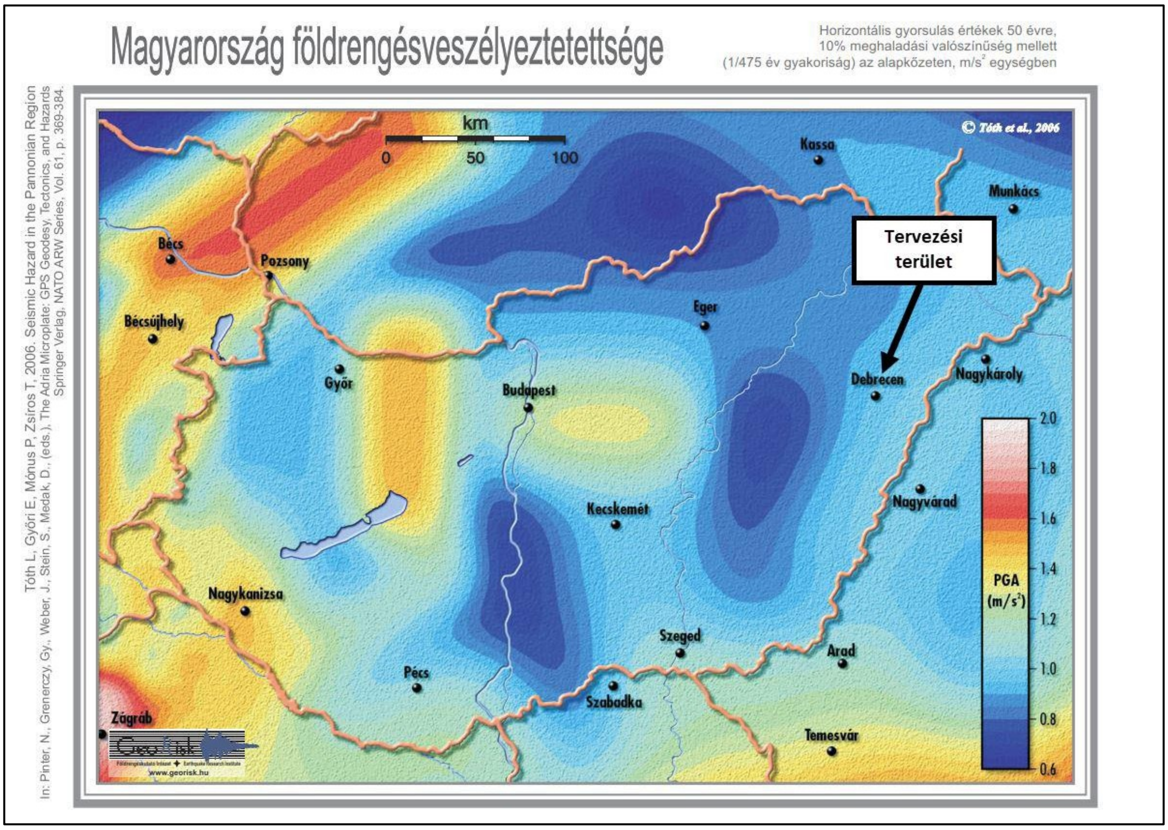
- No alternative site was considered in the selection of the development site.
- No other alternative has been developed in detail for this investment.

7.7. Presentation of the expected impacts exposure to industrial accidents and natural disasters

The expected impacts from exposure to industrial accidents and natural disasters are shown in the maps below.

7.7.1. Expected impacts from exposure to natural disasters

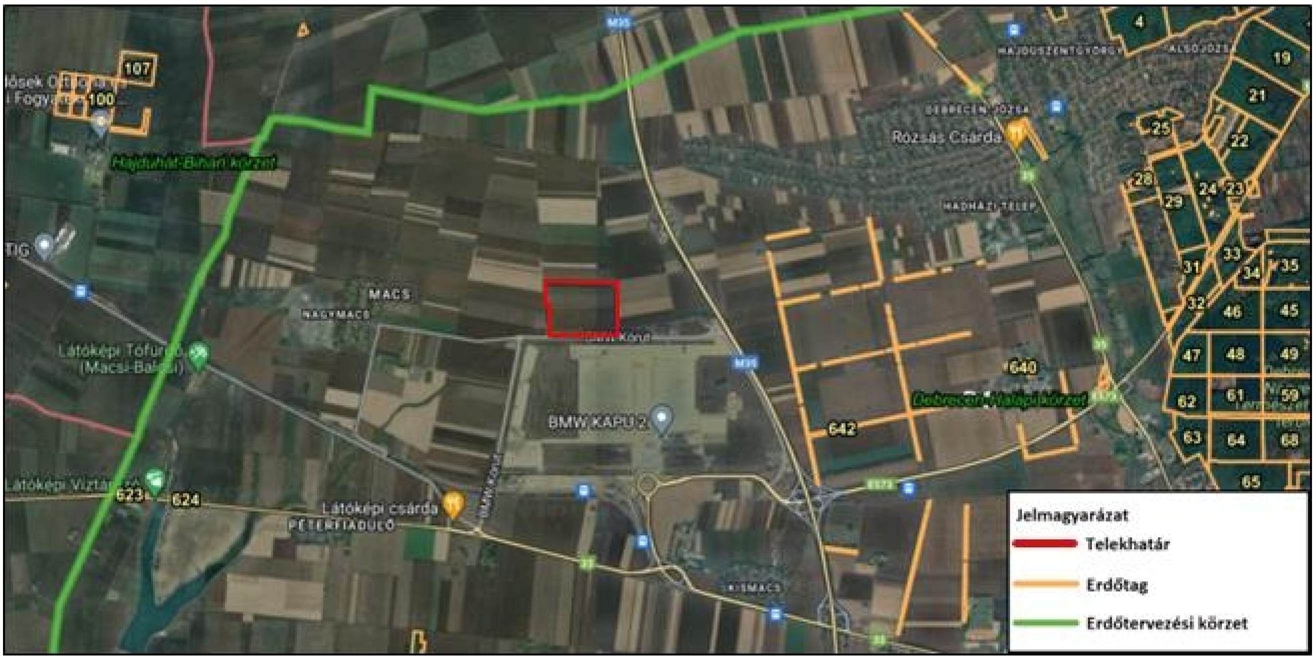
In terms of natural disasters, the vulnerability of the area to earthquakes, potential risks from forest fires, flooding from floods and inland waterways, flash floods and landslides were assessed. In Hungary, 100-120 earthquakes of less than 2.5 magnitude are recorded annually by the sensitive seismological network. Most of these are below the threshold of detectability. This is due to the country's remoteness from major fault lines. As illustrated in Figure 38, the earthquake hazard in the planning area is low.



38. Figure 1: Earthquake risk in Hungary (source: georisk.hu)

So-called surface fires are typical in domestic forests, where the forest floor is covered with dead vegetation and small shrubs. These can develop into crown thickets if burned intensively.

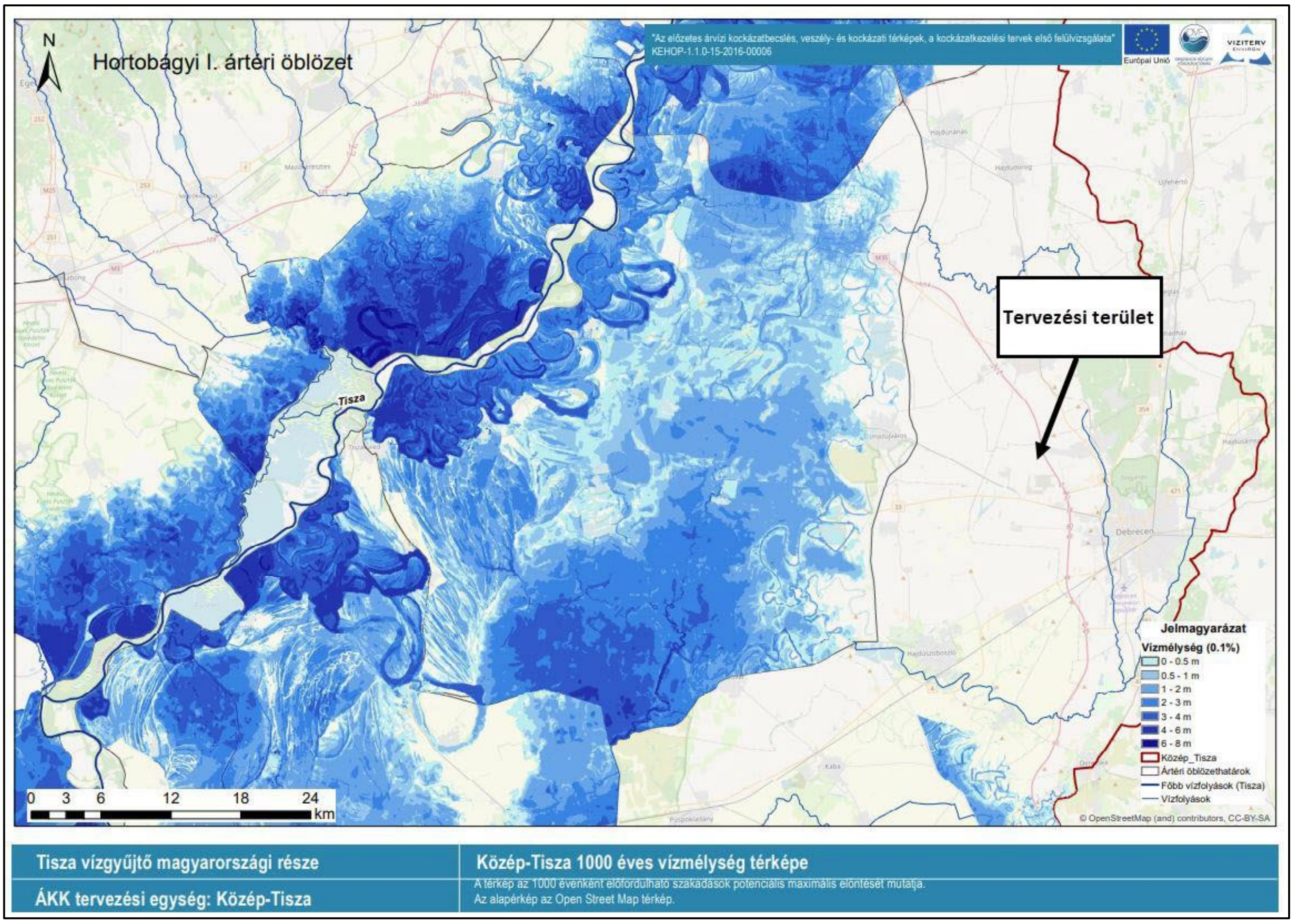
figure below that there are no forest cores in the immediate vicinity of the planning area, so exposure to forest fires is low.



39. Figure 1: forest fragments in the vicinity of the planning area (source: erdoterkep.nebih.gov.hu)

The Tisza is located approximately 40 km west of the planning area. A significant part of the territory of Eastern Hungary is in the Tisza catchment area, which is a dominant feature of the hydrography of Northern Hungary and the Great Plain. The catchment area of the Tisza is about 157 000 km² and its water level is highly variable.

From the figure below, it is easy to see that the planning area is not one of the potentially vulnerable areas of the floodplain on a 1000-year average.



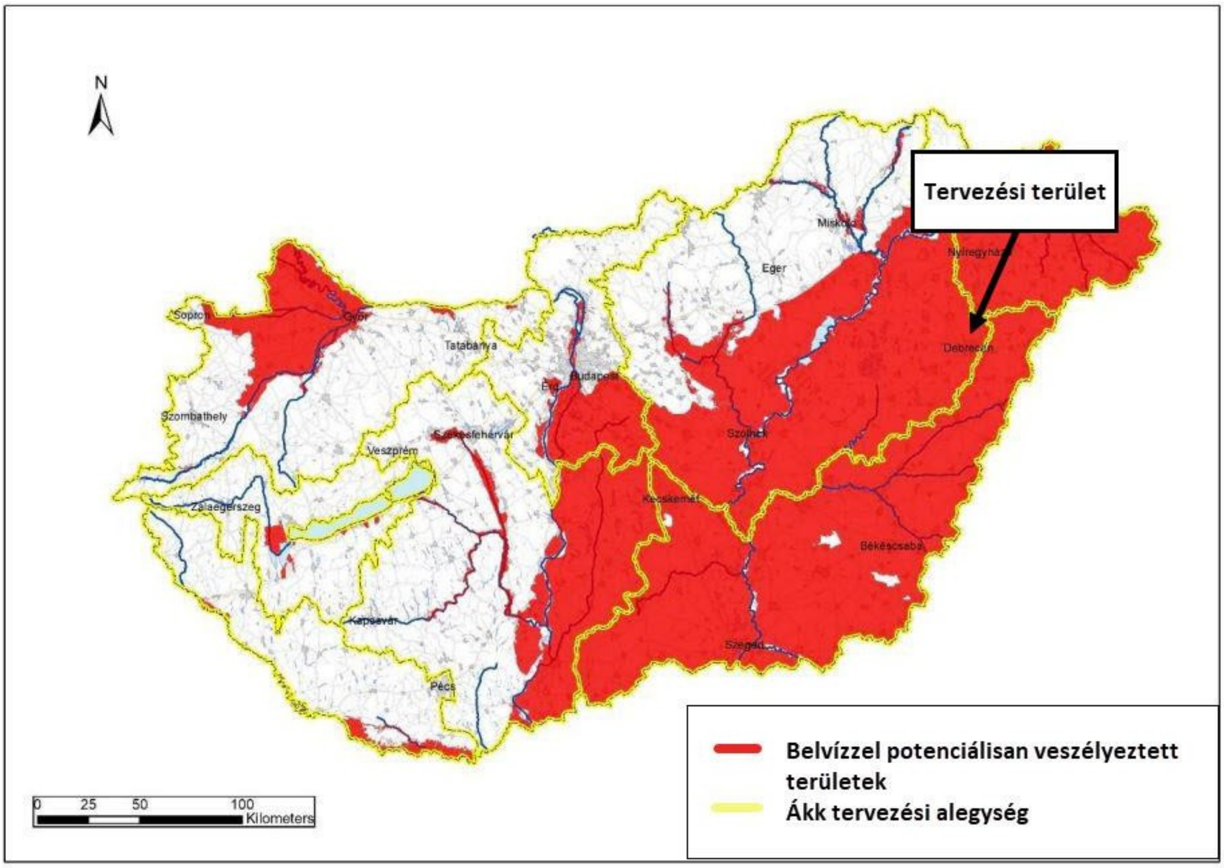
40. Figure 1: 1000-year water depth map of the Central Tisza (Source: Vizeink.hu)

Around forty-five percent of our country is flat land, a quarter of which is low-lying flat land from which water does not naturally drain. Without inland water protection works, these areas would be permanently or intermittently covered for long periods by accumulating snow and rainwater. A significant proportion of Hungary's 45,000 square kilometres of flat land, 60%, is at significant risk from inland flooding. In low-lying areas, the speed of surface run-off is very low, the movement of water is slowed down and drainage is difficult. In such places, water naturally retains in depressions and is drained by artificial means and facilities.

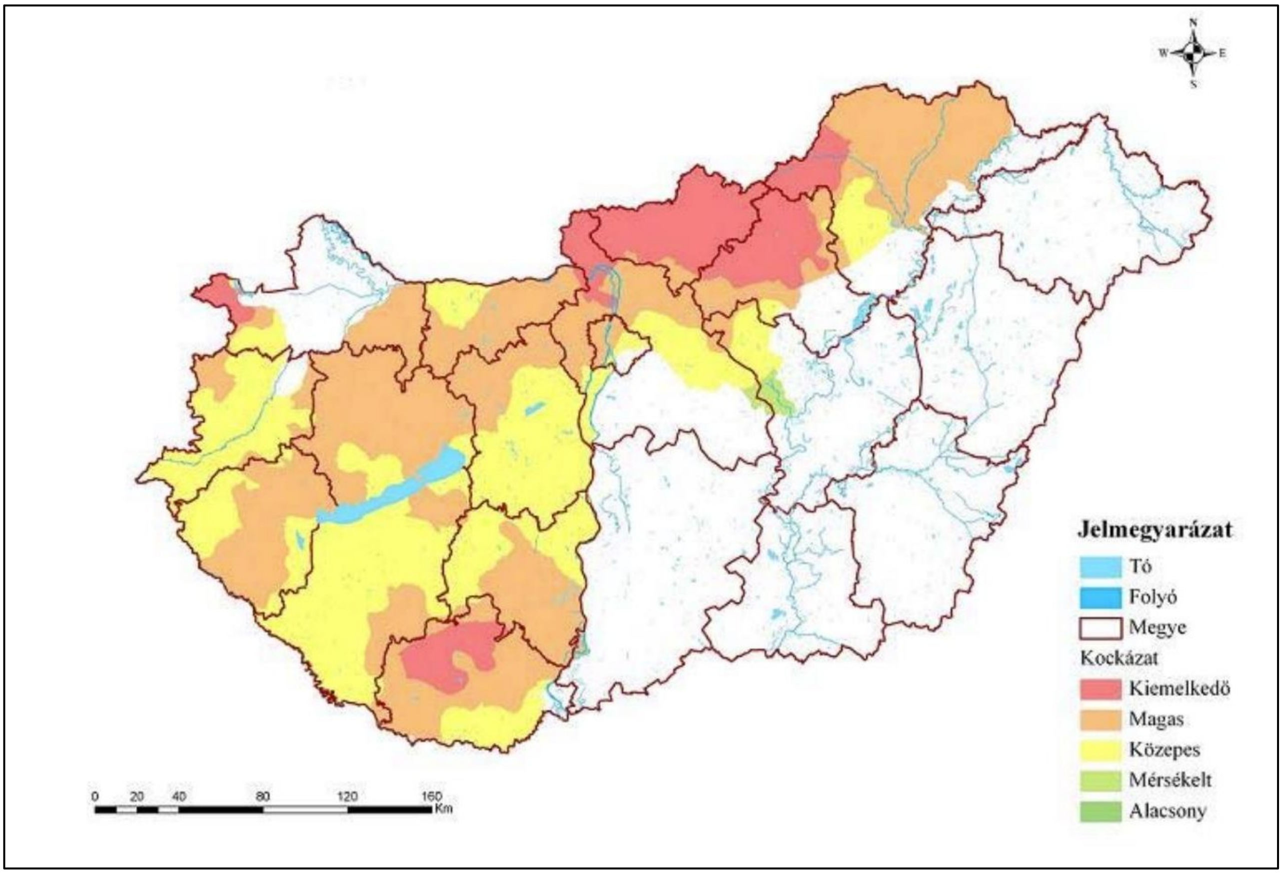
As shown in the figure below, the planning area is located in an area potentially at risk of inland flooding. The likelihood of inundation or flooding, and the likelihood of damage associated with inundation or flooding, is not significant for the planning area, taking into account the following:

- The groundwater table in the area is 5-6 m below ground level, while the maximum groundwater table is expected to be 3.2 m below ground level based on soil mechanics expertise.
- With the pavement design and the collection of stormwater in a closed system, the rate of recharge from the ground will be reduced during operation, and no actual risk of inland flooding is expected in the planning area

- The paving of the green areas will provide additional protection from the buildings.
- It is planned to protect structures below ground level (tanks, manholes) against floating.

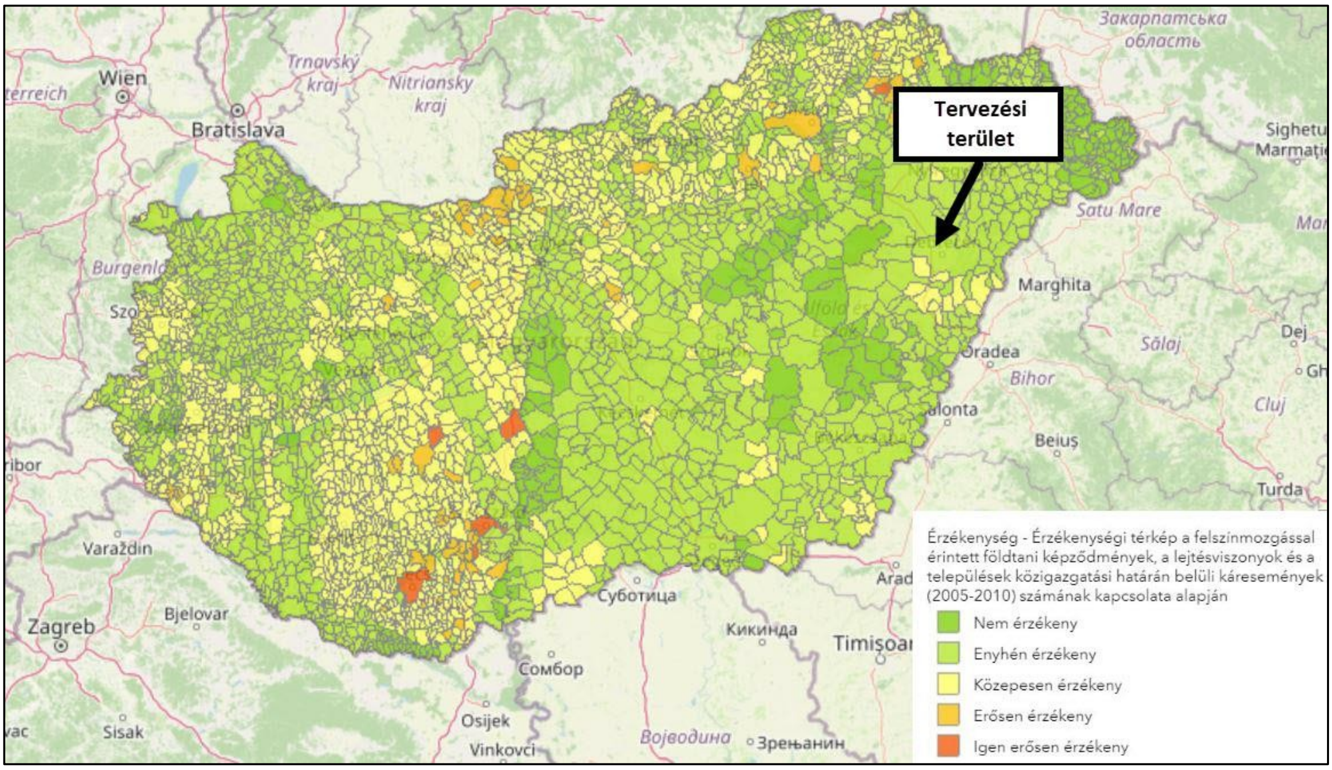


41. Figure 1: Areas potentially at risk of run-off (Source: Our Waters - Preliminary assessment of vulnerability and risk) figure below that the risk of flash flooding in the planning area is not significant.



42. Figure 1: Map of the flash flood risk classification of municipalities in Hungary (source: National Directorate of Disaster Management)

The map below indicates that the planning area and its surroundings are not sensitive to earth formations, slope conditions and damage events within the administrative boundaries of the settlements affected by ground movement.



43. Figure 1: Sensitivity map based on the relationship between the geological formations affected by ground motion, the slope and the number of damage events within the administrative boundaries of the settlements (Source: NAG)

Overall, it can be stated that no industrial accident attributable to a natural disaster can be assumed to have occurred in the planning area and its surroundings.

7.7.2. Expected impacts from exposure to industrial accidents

As in section 5.9, there are no hazardous industrial plants in the vicinity of the planning area, with the exception of the BMW Manufacturing Hungary Kft. facility currently under construction. The industrial safety classification of the facility is a sub-threshold hazardous plant. The industrial safety protection zone of the facility does not extend beyond the site boundary of the facility.

In view of the above, negative impacts from exposure to industrial accidents are not expected.

7.8. Protection of artificial elements

In the project area and its 250 m wide buffer zone, data on 3 known (recorded) archaeological sites were collected through the public site register and museum data. In order to clarify the archaeological significance of the area affected by the modification, a trial excavation of 10 200 m² was planned. Two additional probes were set up for technical reasons to confirm the results of the geophysical survey. The probes were spread evenly over the 30 ha area affected by the change, with the aim of mapping the entire area. The 12 586 m² surface area

The results of the trial excavation were 24 archaeological features concentrated in the areas of known archaeological sites in the area surveyed. In line with the results of the geophysical survey, loose-structured Roman Imperial (Sarmatian) and settlements dating to an indeterminate period of the Migration Period were excavated in the study area.

112. Table 1: Archaeological sites identified during the archaeological heritage assessment

Name	Registration Number	Source of information	Where to find nature of	Age of the site	Position of
Debrecen - Rózsa-dűlő	58424	site inspection, excavation trial excavation geophysical measurement trial excavation full surface excavation	Surface teleprom settlement settlement skeletal cemetery	Neolithic Sarmatian cheetah, new age Sarmatian	concerned
Debrecen - Mács-puszta I.	99187	geophysical measurement	colonial phenomena	Migration of people age	concerned
Debrecen - Mács-puszta II.	99189	geophysical measurement	colonial phenomena	Migration of people age	concerned

During the archaeological assessment, no heritage features to be preserved in situ were identified in the area affected by the excavation works of the proposed project, which, according to Article 21 (3) of the Government Regulation, must be avoided by the excavation works. Based on the results of the archaeological evaluation carried out, and taking into account the provisions of Article 22(3)(ca) and (d) of the Ordinance, the proposed method of preventive excavation is full surface excavation, to be carried out on the part of the site(s) affected by the excavation works.

The average depth of occurrence of archaeological features averages 50-75 cm. Locally, archaeological features occur at shallower depths of 40 cm. The construction is expected to affect deeper layers. For this reason, the level of excavation planned during the construction will exceed the level of the archaeological , i.e. the excavation will reach and break through the level of the archaeological features, or there will be no intact soil layer of a height and consistency sufficient to preserve the archaeological site between the lower level of the soil layer to be removed and the upper level of the archaeological features, and the activity will therefore result in the physical deterioration of the affected part of the site. The excavation of the entire surface shall be carried out at least to the depth of the excavation as specified in the permit or design plan, and all archaeological finds and monuments at the level of the excavation depth shall be excavated (Section 23(1) the Act on the Protection of the Environment).
1 archaeological cultural layer is expected to be found. In the low intensity and low impact areas, archaeological monitoring will be required during the excavation works.

The excavation work of the construction can be carried out with the rigour of archaeological excavation: with a silting machine, per soil level/layer, under the supervision of an archaeological specialist. The time and cost of the demolition work should be taken into account during the archaeological monitoring. Based on the results of the archaeological evaluation carried out, it can be concluded that the excavation works will have a minor impact on the identified archaeological site areas, or that the intensity of the archaeological site area concerned is low, and that sporadic occurrences of archaeological features are expected during the excavation works. Therefore, taking into account the provisions of Article 22(3)(aa) and (ab) of the Ordinance, the proposed method of preventive excavation is archaeological monitoring. Mechanical and manual excavation work must be carried out under the supervision of the archaeologist (Article 36(2) of the Government Regulation), using machinery (rubber wheeled rotary excavator, silting or scraper bucket) suitable for creating an archaeological reflecting surface at the level of the archaeological features. If the excavation work reaches the level of the archaeological features, the corresponding archaeological reflecting surface may also require manual excavation work (cf. Kötv. 7 § 31). If archaeological sites are discovered during excavation work carried out in the course of archaeological monitoring, the features must be excavated and properly documented as part of the monitoring (Government Decree § 35 (1)).

Pursuant to Section 23/E (5) of the Kötv.: in the case of a major investment, excavation works may be carried out under archaeological supervision, and accordingly archaeological supervision must be provided in areas not explored by other methods of excavation (Government Decree No. § If archaeological sites or phenomena are discovered during excavation work carried out under archaeological supervision, the above-mentioned procedure shall be followed in accordance with the provisions of Section 23/E (7) of the Act on the Protection of the Environment, Section 35 (1) of the Government Regulation and Section 45 of the Government Regulation. If an archaeological site is discovered during excavation work carried out in addition to archaeological monitoring, the features shall be excavated and properly documented. According to Article 35(1) of the Government Regulation, if archaeological demolition work becomes necessary during archaeological monitoring, the archaeological demolition work, at least to the depth affected by the excavation work, and the primary archaeological processing must be carried out as part of the archaeological monitoring. In accordance with the provisions of Reg.
Pursuant to Article 45 R., if an archaeological site or an archaeological find discovered during the archaeological monitoring of a major project cannot be in the course of archaeological demolition work without hindering the construction work, the institution carrying out the archaeological monitoring shall immediately notify the authority. The authority shall decide on the necessary measures within five days of receipt of the notification.

Pursuant to Article 46 (1-3) of the Government Decree, if an archaeological monument preserved in its original context is during a preventive excavation or archaeological monitoring, the institution carrying out the excavation must notify the authority within three days and, in the case of a preventive excavation, the investor. The authority shall decide within twenty days on the avoidance or on-site preservation and management of the notified archaeological monument and on the necessary conservation measures. If the archaeological monument was discovered during a preventive excavation and is to be preserved on site on the basis of a decision of the authority, the technical design and construction of the project must take into account the preservation of the monument. In this case, the excavation institution shall provide the investor with information on the archaeological monument within fifteen days of the completion of the excavation field work. As part of the data provision, the archaeological monuments to be demolished and preserved on site in their original location must be clearly indicated on a drawing.

7.9. Noise and vibration protection

7.9.1. Default state

As described in Section 5.10, the noise status of the planning area is determined by the traffic-related noise pollution of the surrounding roads. Based on the results of the monitoring noise measurements carried out in the immediate vicinity, no exceedances of the traffic noise limit were detected in the area.

During the measurements, noise from traffic was audible at points M1, M2, M3, M4, M6, which is the noise pollution from the M35 motorway and the secondary road 33. The M5 measurement point was an exception.

The noise footprint of the project has been delineated on the basis of background noise at night, as it is larger than the daytime footprint.

No operating noise was heard or measured at the measurement points.

Traffic noise measurements were not carried out for the project.

7.9.2. Noise protection requirements

7.9.2.1. Noise emission limits

The residential buildings listed in the scope are not affected by the scope delineated for the non-protected environment, as it does not reach the part of the non-protected agricultural land where the buildings to be protected are located. Given that Annex 1 to Joint Decree 27/2008 (XII. 3.) of the Ministry of Transport, Building and Urban Affairs of the Republic of Hungary on the establishment of environmental noise and vibration exposure limit values does not establish noise exposure limit values for agricultural areas, the Licensee does not request the establishment of noise emission limit values within the framework of this procedure.

7.9.2.2. Noise protection requirements for installation (construction)

The noise exposure limits for noise from construction activities are defined in Annex 2 of Joint Decree 27/2008 (XII.3.) of the Ministry of Transport, Building and Urban Affairs according to the nature of the area to be protected from noise and the duration of the construction work.

The construction of the planned facility is expected to take more than 1 year.

- In relation to recreation area day/night= 50 dB / 35 dB
- For small urban, suburban residential areas day/night= 55 dB / 40 dB
- Mixed area. for metropolitan residential area day/night= 60 dB / 45 dB
- For commercial areas day/night= 65 dB / 50 dB

7.9.2.3. Noise protection requirements for operation

The noise exposure limit values from the operation are set in the Joint Decree 27/2008 (XII. 3.) KvVM-EüM 1.
is defined by the nature of the area to be protected from noise.

- For commercial areas day/night= 60 dB / 50 dB
- For mixed area day/night= 55 dB / 45 dB
- For small urban, suburban residential areas day/night= 50 dB / 40 dB
- In relation to recreation area day/night= 45 dB / 35 dB

7.9.2.4. Limit values for transport installations

In the wider area of the facility are the 354 road, the Northern access road, the 33 main road and the M35 motorway. Direct access to the site is provided by the BMW ring road.

The noise exposure limit values for the road concerned from construction activities according to Annex 3 of Joint Decree 27/2008 (XII. 3.) KvVM-EüM:

Main roads and motorways (main road 33, motorway M35):

- Holiday area: 60/50 dB(A)
- Residential (small urban, suburban, rural, built-up): 65/55 dB(A)
- Residential area (with large urban development), mixed area: 65/55 dB(A)
- Economic area: 65/55 dB(A)

From local authority-owned collector roads and suburban roads (BMW Boulevard, Northern access road, Route 354):

- Holiday area: 55/45 dB(A)
- Residential (small urban, suburban, rural, built-up): 60/50 dB(A)
- Residential area (with large urban development), mixed area: 65/55 dB(A)
- Economic area: 65/55 dB(A)

7.9.3. Impacts during the implementation period

7.9.3.1. Construction noise

The investment area is a set-aside area, typically disturbed. During construction, landscaping is required, which will involve moving and transporting soil. Noise from earthmoving machinery, hand tools, lifting equipment and lorries is expected during construction.

The sound power levels of the equipment with significant noise exposure considered are as follows.

113. Table 1: Expected noise exposure of machinery and lorries during the construction phase - daytime

Machine name	Type of machine	Lw (dB)
Liebherr R926LC	excavator	104 dB
Liebher RR 726 LGP	dozer	109 dB
Bomag BV213	cylinder	84,3 dB
BAUER BG-28 H	pile driver	112 dB
BAUER BG-28V 3206	pile driver	112 dB
JCB 532	telescopic handler	84 dB
CIFA PCC907	concrete pump	85,6 dB
Multitel MT202 DS	mobile work platform	86,2 dB
BG-33 H	pile driver	112 dB
Mercedes 930.14	concrete pump	85,6 dB
CIFA PCC907/612D8	concrete pump	85,6 dB
BG 24H	pile driver	113 dB
BG 30V	pile driver	109 dB
Liebherr Hs855 HD	crawler crane	88,8 dB
Kato NK-20	car crane	81,4 dB
Genie Z45	self-propelled arm work platform	84 dB
Komatsu PC240 NLC-11 E0	crawler excavator	103 dB
Wacker Neuson 50Z3	rotary excavator with rubber chain	96 dB
Wacker Neuson 12002 RDV	crawler excavator	101 dB
CAT 428C	rubber wheel excavator loader	105 dB
CAT320C	crawler excavator	97 dB
Sunward SWE365F	crawler excavator	103 dB
Sunward SWE 155FW2	rubber wheel excavator	105 dB
SHANDONG Shantui SD32-8	dozer	109 dB
XCMG ZL50gv	frontloading	83,8 dB
Internal concrete delivery	-	68,8 dB/m
Internal concrete plant	-	84.1 dB/m^2

During excavation work on the site, the highest noise exposure is expected to be caused by the combined presence of the above machinery, distributed over the work area as shown in the figure below. During the night time period ~50% of the presented machinery fleet is working in the area due to limitations in the supply of raw materials, therefore the operational capacity of the concrete plant constructed in the area is reduced during this period.

114. Table 1: Expected noise exposure of machinery and lorries during the construction phase - night time

Machine name	Type of machine	Lw (dB)
Kato NK-20	car crane	81,4 dB
Mercedes 930.14	concrete pump	85,6 dB
Mercedes 930.14	concrete pump	85,6 dB
BAUER BG-28 H	pile driver	112 dB
BAUER BG-28V 3206	pile driver	112 dB
SHANDONG Shantui SD32-8	dozer	109 dB
Sunward SWE 155FW2	rubber wheel excavator	105 dB
Wacker Neuson 50Z3	rotary excavator with rubber chain	96 dB
Bomag BV213	cylinder	84,3 dB
XCMG ZL50gv	frontloading	83,8 dB
Liebherr Hs855 HD	crawler crane	88,8 dB
Komatsu PC240 NLC-11 E0	crawler excavator	103 dB
Wacker Neuson 12002 RDV	crawler excavator	101 dB
Multitel MT202 DS	mobile work platform	86,2 dB
JCB 532	telescopic handler	84 dB
Internal concrete delivery	-	65,8 dB/m
Internal concrete plant	-	81.1 dB/m^2

The location of the noise sources is shown in the figure below.

Figure 44 Location of noise sources

A noise model for the proposed facility has been developed using the IMMI 2024 software. The software uses a method that produces results equivalent to those provided for in the MSZ 15036 standard and in Decree 93/2007 (XII. 18.) of the Ministry of Transport and Public Works on the method of establishing noise emission limits and the method of monitoring noise and vibration emissions.

The calculated noise exposure values for the hypothetical worst-case points considered in the modelling are shown in the table below. More detailed data can be found in the site plan in Annex 2.8.

115. Table 1 Calculated noise exposure results during construction works [dB(A)]

Name to be protected	Calculation result		Threshold	
	Daytime	At night	Daytime	At night
Ágnes farm, 0237/258	40,1	36,9	55	40
Józsa, 53252/7	41,0	37,8	55	40
Kismacs, 65004	34,6	31,4	55	40
Kismacs, 65007	33,4	30,2	55	40
Kismacs, 65008	26,1	22,9	55	40
Kismacs, 65009	23,6	20,4	55	40
Kismacs, 65010	34,7	31,4	55	40
Kismacs, 65011	32,6	29,4	55	40
Kismacs, 65012	35,6	32,4	55	40
Kismacs, 65013	35,3	32,2	55	40
Kismacs, 65014	25,2	22,0	55	40
Kismacs, 65015	35,5	32,3	55	40
Kismacs, 65016	35,5	32,3	55	40
Kismacs, 65017	35,4	32,2	55	40
Small Catfish-Petersian shoot, 0263/10	40,9	37,7	55	40
Small Catfish-Petersburg, 0263/3	37,1	33,9	55	40
Small catfish-Peterfiad shoot, 0263/4	40,2	37,0	55	40
Small catfish-Peterfiad shoot, 0263/6	40,6	37,4	55	40
Small Catfish-Petersburg, 0263/8	41,7	38,5	55	40
Big Mach, 0288/38	40,7	37,5	55	40
Nagymacs, 67007	40,0	36,7	55	40
Sightseeing Bar, 0316/58	38,4	35,2	55	40
Nagymacs, 0292/1	42,2	38,9	55	40
Nagymacs, 65035/2	40,6	37,4	55	40
Józsa, 53255/3	41,0	37,8	55	40

Based on the data provided, there are no areas with a protected function in the industrial facilities located in the vicinity of the planning area. The calculation results show that the project can comply with the noise protection limits at the points under consideration during the site preparation works. The details of the noise model calculation according to the Decree 93/2007 (XII. 18.) of the Ministry of Transport and Communications of 18 December 2007 are attached in Annex 1.23.

7.9.3.2. Traffic noise

The construction works are subject to the traffic increase described in chapter 4.15.1.

The calculation is carried out in accordance with the provisions of Decree 93/2007 (XII. 18.) KvVM. The starting point taken into account is
data are as follows:

116. Table 3: Baseline data for noise calculation

		M35 motorway north	M35 motorway south	Highway 33	Route 354	Northern access About M35	BMW Boulevard North	BMW Boulevard East	BMW Boulevard West	BMW Boulevard South
Type of road		M0 and M3, M7 motorways on M0 stages outside the	M0 and M3, M7 motorways on M0 stages outside the	Characteristic2=2 (average nightly traffic roads)	Jelleg2=3 (small night-time traffic roads)	Jelleg2=3 (small night-time traffic roads)	Jelleg2=3 (small night-time traffic roads)	Jelleg2=3 (small night-time traffic roads)	Jelleg2=3 (small night-time traffic roads)	Jelleg2=3 (small night-time traffic roads)
Number of lanes		4	4	4	2	2	2	2	2	2
Envelope condition		A	A	A	B	A	A	A	A	A
Nature of traffic		Uniform	Uniform	Uniform	Uniform	Uniform	Uniform	Uniform	Uniform	Uniform
Longitude (%)		0	0	0	0	0	0	0	0	0
Nature of the longfall		rising	rising	rising	rising	rising	rising	rising	rising	rising
Speed (km/h)	**I**	130	130	90	90	60	60	60	60	60
	II	100	100	70	70	60	60	60	60	60
	III	80	80	70	70	60	60	60	60	60
Distance to be protected (m)		430	290	75	560	500	940	635	1140	350
Nearest parcel to be protected.		53377 (Rose Valley Street 240.)	0356/2	65040/1 (Greenfield 2.)	0249/4 (Varga farm)	53255/3 (215 Elek street)	0237/258 (Ágnes farm)	0249/6 (Domokos Márton garden 51.)	0263/8 (Peter's Day 5.)	0249/6 (Domokos Márton garden 51.)
Nature of the area between the road to be protected and the road		Weed	Weed	Weed	Weed	Weed	Weed	Weed	Weed	Weed

Calculated noise exposure during the day and night at 7.5 m from the centre line of the traffic lane actually used is shown in the tables below.

117. Table 2: Calculation results of the baseline noise exposure of the road sections under study during the construction period (2025)

		M35 motorway north	M35 motorway south	Highway 33	Route 354	Northern access About M35	BMW Boulevard North	BMW Boulevard East	BMW Boulevard West	BMW Boulevard South
Distribution of excess traffic on the road section	**I**	25%	15%	25%	10%	25%	100%	25%	25%	25%
	II	25%	25%	0%	10%	25%	100%	25%	25%	25%
	III	50%	50%	0%	0%	50%	100%	50%	0%	50%
Calculated noise exposure at reference distance	**Daytime**	76,1 dB(A)	76,2 dB(A)	70,1 dB(A)	72,2 dB(A)	70,9 dB(A)	58,4 dB(A)	69,0 dB(A)	55,7 dB(A)	70,1 dB(A)
	At night	69,2 dB(A)	69,3 dB(A)	60,7 dB(A)	62,0 dB(A)	62,6 dB(A)	49,5 dB(A)	60,7 dB(A)	46,8 dB(A)	61,8 dB(A)
Calculated noise exposure at the property to be protected	**Daytime**	49,7 dB(A)	52,4 dB(A)	55,1 dB(A)	44,1 dB(A)	43,5 dB(A)	26,9 dB(A)	40,1 dB(A)	23,0 dB(A)	45,1 dB(A)
	At night	42,8 dB(A)	45,5 dB(A)	45,7 dB(A)	33,9 dB(A)	35,2 dB(A)	18.1 dB(A)	31,8 dB(A)	14,0 dB(A)	36,7 dB(A)

The calculated values clearly show that, under the current traffic data and speed limits, no loads exceeding the noise limits are expected to occur along the road sections under consideration on the study section potentially affected by the project, for the protected areas along the road sections under consideration.

The daily distribution of the expected increase in traffic (178 lorries/day) is calculated on the basis of a maximum increase of 11 lorries per hour between 07:00 and 19:00 during the daytime period, and a maximum increase of 4 lorries per hour between 19:00 and 06:00 during the night period, taking into account the continuous work schedule.

HGV traffic to the facility is expected to access the site via the M35 motorway, the northern access road to the M35 motorway and the northern, eastern and southern sections of the BMW Boulevard to reduce congestion in the inner areas.

118. Table 1: Calculated noise exposure for the road sections under study during the construction period [dB (A)]

Co-loading with increment		M35 motorway north	M35 motorway south	Highway 33	Route 354	Northern access About M35	BMW Boulevard North	BMW Boulevard East	BMW Boulevard West	BMW Boulevard South
Calculated noise exposure at reference distance	**Daytime**	76,1	76,3	70,1	72,2	70,9	59,8	69,1	55,8	70,2
	At night	69,2	69,3	60,8	62,0	62,7	52,2	60,7	47,5	61,9
Calculated noise exposure at the property to be protected	**Daytime**	49,8	52,5	55,1	44,1	43,6	28,3	40,2	23,1	45,1
	At night	42,8	45,5	45,8	34,0	35,3	20,7	31,8	14,0	36,8
Rate of increase	**Daytime**	0,0	0,0	0,0	0,0	0,0	1,4	0,1	0,1	0,1
	At night	0,0	0,0	0,0	0,0	0,1	2,6	0,0	0,0	0,1

As shown in the table:

- For the protected sites along the road sections concerned, no exceedance of the limit value can be assumed in the baseline situation.
- The increase of 0.1 dB is due to the northern access road to the M35 motorway (night), the eastern section of the BMW Boulevard (day), the western section of the BMW Boulevard (day) and the southern section of the BMW Boulevard (day).

  and at night) does not cause the limits to be exceeded and does not exceed the limit of detection (0,5 dB)[(5).]
- For the northern section of BMW Boulevard, an increase of 1.4 dB during the day and an increase of 2.6 dB during the night do not result in an exceedance of the limit values, but exceed the limit of detection (0.5 dB).

[5] The detection threshold for sound intensity is generally around 1 dB. This means that a change in noise level of about 1 dB is usually the smallest difference that the average person can detect. It is possible that in some circumstances this threshold may be as low as 0,5 dB in noise level. The literature suggests that people are more sensitive to differences in louder sounds, so that the value may be reduced to 0.5 dB at higher noise levels, for example around 90 dB. This lower value is often observed in controlled environments subjects are focused on the sound effects and changes in sound levels are instantaneous. Based on the above, the 0.5 dB threshold has been included in the documentation in favour of safety.
Sources: Forinash, K., & Christian, W. (2016). Sound: An interactive ebook. (https://phys.libretexts.org/Bookshelves/Waves_and_Acoustics/Book:_Sound_-_An_Interactive_eBook_(Forinash_and_Christian); David Abbott (2019). Understanding Sound (https://pressbooks.pub/sound/)

7.9.4. The impact of construction on vibration

We distinguish between the following according to the purpose of the vibration test:

- **ambient vibration**: vibration is measured to determine its impact on humans, i.e. the vibration characteristics are measured at the place where the human is located, usually on the floor of the living room, i.e. the ceiling of the dwelling.
- **building vibration:** the aim of the measurement is to obtain information about the impact of the vibration on the building, i.e. whether the building is likely to suffer damage that would reduce its utility value. The measurement is then taken at the base of the building or at the top floor slab level.

Taking into account the above, during the vibration measurement, compliance with the limit values set out in Annex 5 can be assessed in accordance with the provisions of Joint Decree 27/2008 (XII. 3.) KvVM-EüM, which means compliance with the environmental vibration requirements as follows:

119. Table 1: Environmental vibration exposure limits

Building, premises		Machine load limits (mm/s²)	
		AM	Amax
Residential building, holiday building, social home, accommodation building, hospital, residential and recreational facilities of the sanatorium	daytime 06-22 hours	10	200
	night 22-06 hours	5	100

A brief summary of how environmental vibration is assessed is as follows:

- if the maximum value selected from the series of half-minute maxima of the measured vibration events is less than
  is below the $_{A0}$ threshold, then the vibration exposure is compliant;
- if the maximum value selected from the series of half-minute maxima of the measured vibration events exceeds
  the $_{Amax}$ limit, then the vibration load is not compliant;
- if the highest selected from a series of half-minute maxima of the measured vibration events falls between $_{A0}$ and $_{Amax}$, then the vibration exposure determined by the values of the series for the judgement time shall be below the $_{AM}$ limit.

Building vibration effects shall be tested in accordance with the requirements of MSZ 13018:1991. The limit values are also by this standard, which in the vicinity of the project area are as shown in the table below.

120. Table 1: Limits for building vibration

Building types	Permissible directional values of vibration velocity v, mm/s			
	on the bases, if the frequency			the top full level in the slab plane, horizontally, at any frequency
	<10 Hz	10-50 Hz	50-100* Hz	
Residential buildings and similar buildings	5	5-15	15-20	15

* For frequencies above 100 Hz, the directional value may be even higher, but must be at least equal to the value at 100 Hz.
account.

Based on literature data, the range of vibration loads for typical excavation works, where the
the activity causes measurable vibration - on average 20-30 metres from the work area, with significant

for activities involving vibrations, the maximum distance is 100 metres. There no buildings to be protected within this distance at this , so the design of the facility is unlikely to have a significant impact on vibration protection and is unlikely to exceed the vibration protection limits.

7.9.4.1. Vibration protection effects of generated traffic

During the construction and operation period, vibration is expected to occur in the vicinity of the affected road sections due to transport activities. The impact of vibration, its propagation distance, depends on:

- type of soil (loose, rocky), texture, water content, temperature (freezing),
- soil dynamic properties (shear modulus, wave propagation velocity, damping factor, density, Poisson's ratio, natural frequency),
- wave propagation in the soil, body waves (shear, pressure), surface waves
- structures in the ground (piling, grouting), pipes in the ground, sewers, old building fragments,
- woody vegetation on the spreading way (root system)
- the foundation and transmission properties of the building to be protected.
- relevant characteristics of the roads
    - route guidance (uphill, downhill, bend, etc.)
    - the type, design and condition of the pavement,
    - road sub- and superstructure structure (number of layers, thickness, type),
    - dynamic characteristics of the road sub- and superstructure (shear modulus, damping factor, density, Poisson's ratio, natural frequency, wave propagation velocity),

The actual load on properties in the immediate vicinity of roads cannot be accurately determined by calculation, as the results of the available calculation methods are highly dependent on a large number of influencing factors described above, which cannot be assessed in detail.

It should be pointed out here that, based on the results of measurements carried out in previous projects, the impact of a lorry with a 40 t load capacity travelling at 40 km/h was found to be a maximum of 1.4 mm/s^2, which at lower speeds and with a smaller load was reduced to below the detection limit, so that the limit in Table 120 is not expected to be exceeded. The transport with significant freight traffic is loaded onto the BMW ring road and the M35 motorway, avoiding residential areas. Given the significant distances between the defences along the roads planned to be used for transport, the vibrations generated by the freight traffic will be negligible for the defences concerned.

In the case of the measurement referred to, the building to be protected was located at a distance of 10 metres from the centre line of the road used for traffic. The measurement was carried out on the floor of the two-storey dwelling house closest to the road section under consideration, on the slab of the street room (ambient vibration) and on the plinth in front of the entrance stairs (building vibration). During the measurements, a truck with a maximum load capacity of 40 tonnes passed several times in front of the selected back. The passages were made at different speeds and with different loads. The results of the measurements showed that at a load of 40 tonnes and a speed of 40 km/h the ambient vibration rate 1.4 mm/s^2, while at lower speeds (30 km/h; 40 tonnes load) and lower loads (40 km/h; 20 tonnes load) the ambient vibration rate remained below the base vibration rate.

The nearest building to be protected is 290 m from the road carrying the heavy traffic, so no vibration effects through the structure of the buildings in the vicinity of the building to be protected are expected, and therefore adverse effects from vibrations are not expected, and therefore no speed limit is necessary.

It is also recommended to consider a 30 km/h speed limit for HGV traffic of 40 tonnes or more to reduce the vibration load. In the event of a complaint, an environmental or building vibration monitoring survey should be carried out and the speed and/or the use of lorries should be reduced depending on the results. It should be stressed that in the latter case the time required for transport will increase.

7.9.5. Effects during the period of operation

7.9.5.1. Operational noise

In the planning area, the installation of point sources associated with technology, point and surface sources associated with mechanical equipment, and surface source parking lots are planned. For internal transport, a line source approach was used to assess impacts in areas with significant freight traffic.

The facility is in continuous operation and therefore the noise sources are also in continuous operation. The main details of the point, surface and line noise sources considered are given in the tables below.

121. Table 1: Technology-related noise sources of the planned installation

Noise source Name	Noise source type (related activity)	Sound power level (dB)		Height (m)	Item number	Building	Noise source location	Noise source nature of
		Daytime	At night					
P1	Cathode slurry solid administration of ingredients	89	89	27	1	EN	roof	Point
P2	Anode slurry solid administration of ingredients	89	89	27	1		roof	Point
P3	Slurry production of cathode	89	89	27	1		roof	Point
P4	Slurry production anode	89	89	27	1		roof	Point
P5	Cathode film dust extraction	89	89	27	1		separation equipment inside the building, its horn is discharged outside the building	Point
P6	Cathode foil coating	89	89	27	1		roof	Point
P7	Cathode foil coating	89	89	27	1		roof	Point
P8	Cathode foil coating	89	89	27	1		roof	Point
P9	Anode foil dust extraction	89	89	27	1		separation equipment inside the building, its horn is discharged outside the building	Point
P10	Anode foil coating 1	89	89	27	1		roof	Point
P11	Anode foil coating 2	89	89	27	1		roof	Point
P12	Anode foil coating 3	89	89	27	1		roof	Point
P13	Laser cutting and winding 1	89	89	27	1	AS	roof	Point
P14	Laser cutting and winding 2	89	89	24,45	1		roof	Point
P15	Laser cutting and winding 3	89	89	24,45	1		roof	Point
P16	Laser cutting and winding 4	89	89	24,45	1		roof	Point
P17	Laser cutting and winding 5	89	89	24,45	1		roof	Point
P18	Laser cutting and winding 6	89	89	24,45	1		roof	Point
P19	Laser cutting and winding 7	89	89	24,45	1		roof	Point
P20	Laser cutting and winding 8	89	89	24,45	1		roof	Point
P21	Engraver	89	89	24,45	1		roof	Point
P22	Assembly line 1	89	89	24,45	1		roof	Point
P23	Assembly line 2	89	89	24,45	1		roof	Point
P24	Assembly line 3	89	89	24,45	1		roof	Point
P25	Vacuum drying	89	89	24,45	1		roof	Point
P26	Assembly 4	89	89	24,45	1		roof	Point
P27	Injection 1	89	89	24,45	1		roof	Point
P28	Injection 2	89	89	24,45	1		roof	Point
P29	Injection 3	89	89	24,45	1		roof	Point
P30	Closure welding 1	89	89	23,94	1	FO	roof	Point
P31	Closure welding 2	89	89	23,94	1		roof	Point
P32	Closure welding 3	89	89	23,94	1		roof	Point
P33	Formatting 1	89	89	23,94	1		roof	Point
P34	Formatting 2	89	89	23,94	1		roof	Point
P35	Formatting 3	89	89	23,94	1		roof	Point
P36	Print from	89	89	24,56	1	SO	roof	Point
P37	Electrolyte tank farm	89	89	10	1	EL (ET-P1)	on the ground	Point

Noise source Name	Noise source type (related activity)	Sound power level (dB)		Height (m)	Item number	Building	Noise source location	Noise source nature of
		Daytime	At night					
P38	NMP tank farm	89	89	10	1	NT (NT-P1)	roof	Point
P39	Anode foil treatment (BD building)	89	89	10	1	BD (P-BD)	on the ground	Point
P40	Test building 1	89	89	11,5	1	BS (P-BS1)	roof	Point
P41	Test building 2	89	89	11,5	1	BS (P-BS2)	roof	Point
P42	Waste storage	89	89	8	1	DW (P-DW)	on the ground	Point
P43	Raw material testing	89	89	21	1	RM	roof	Point
P44	Steam boiler 1	45,8	45,8	40	1	PS	on the ground	Point
P45	Steam boiler 2	45,8	45,8	40	1		on the ground	Point
P46*	Steam boiler 3	45,8	45,8	40	1		on the ground	Point
P47	Hot oil boiler 1	55,5	55,5	40	1		on the ground	Point
P48*	Hot oil boiler 2	55,5	55,5	40	1		on the ground	Point
P49	Hot oil boiler 3	55,5	55,5	40	1		on the ground	Point
P50	Sewage treatment suction	89	89	30	1	PS	on the ground	Point
P51	Kitchen oil extraction 1	100	100	20,5	1	MU	roof	Point
P52	Kitchen oil extraction 2	100	100	20,5	1		roof	Point
P53	Diesel pump	89	89	19,5	1	PS	vented, outside the building	Point
P54	Diesel pump	89	89	19,5	1	PS	vented, outside the building	Point
Diesel pump air supply	Diesel pump air replacement	89	89	0,5	3	PS	facade	Point

* The candidate point sources are redundant.

122. Table 1: Noise sources of the planned installation

Noise source name	Noise source type	Sound power level (dB)		Height (m)	Item number	Building	Total number of items	Noise source location	Noise source nature of
		Daytime	At night						
Samsung AC100BXPDKH	split air conditioner	64	64	8,37	4	BS	31	roof	Point
				24,68	6	FO		roof	
				17,45	12	PS		roof	
				20,15	1	AS		roof	
				22,7	8	EN		roof	
BLR-A60	vent	89	89	8	3	BS	83	roof	Point
				5,5	2	BS		facade	
				23	15	EN		roof	
				25	12	EN		roof	
				18	38	EN		facade	
				16	2	EN		facade	
				17,645	2	EN		facade	
				18,825	2	EN		facade	
				18,998	1	EN		facade	
				19	2	EN		facade	
				18,5	2	EN		facade	
				18,5	2	AS		facade	
		99	99	6,15	3	EN	17	facade	
				4,15	5	EN		facade	
				1,1	3	EN		facade	
				15,65	2	AS		facade	
				11	1	AS		facade	
				4,02	3	AS		facade	
Samsung AC052BXAPKG	split air conditioner	64	64	19,64	7	FO	23	roof	Point
				24,68	1	FO		roof	
				20,15	6	AS		roof	
				22,7	8	EN		roof	
				20,26	1	SO		roof	
	split air conditioner	59	59	19,64	11	FO	33	roof	Point

Noise source name	Noise source type	Sound power level (dB)		Height (m)	Item number	Building	Total number of items	Noise source location	Noise source nature of
		Daytime	At night						
Samsung AC026BXAPKG				20,15	7	AS		roof	
				22,7	7	EN		roof	
				17,45	1	PS		roof	
				20,26	4	SO		roof	
				4,45	1	LO		roof	
				6,08	2	EM		roof	
Samsung AC071BXAPKG	split air conditioner	64	64	17,45	2	PS	29	roof	Point
				20,15	16	AS		roof	
				22,7	8	EN		roof	
				4,45	3	LO		roof	
Samsung AC100BXAPKG	split air conditioner	66	66	19,64	6	FO	14	roof	Point
				24,68	4	FO		roof	
				20,26	4	SO		roof	
Samsung AC140BXAPNG	split air conditioner	70	70	20,26	6	SO	21	roof	Point
				21,7	2	RM		roof	
				16,62	13	MU		roof	
Samsung AC035BXAPKG	split air conditioner	61	61	20,26	1	SO	1	roof	Point
Samsung AC100BXAPNG	split air conditioner	66	66	16,62	1	MU	10	roof	Point
				19,64	9	FO		roof	
Samsung AC052MXADKH	split air conditioner	62	62	16,62	4	MU	4	roof	Point
Samsung AC120BXAPNG	split air conditioner	69	69	16,62	1	MU	1	roof	Point
Auxiliary fan	fan	84	84	19,95	25	AS	29	roof	Point
				19,44	3	FO		roof	
				20,06	1	SO		roof	
Reserve fan	fan	84	84	22,5	12	EN	12	roof	Point

HRWA3-040	heat recovery	89	89	4,25	2	LO	2	roof	Point
Noise source name	**Noise source type**	**Sound power level (dB)**		**Height (m)**	**Item number**	**Building**	**Total number of items**	**Noise source location**	**Noise source nature of**
		Daytime	**At night**						
MAU-SO-JKZF-01	roof fan	89	89	21,5	1	SO	1	roof	Point
MAU-SO-JKZF-02	roof fan	89	89	21,5	1	SO	1	roof	Point
MAU-SO-JKZF-03	roof fan	89	89	21,5	1	SO	1	roof	Point
MAU-SO-JKZF-04	roof fan	89	89	21,5	1	SO	1	roof	Point
MAU-SO-JKZF-05	roof fan	89	89	21,5	1	SO	1	roof	Point
MAU-SO-JKZF-06	roof fan	89	89	21,5	1	SO	1	roof	Point
MAU-SO-JKZF-07	roof fan	89	89	21,5	1	SO	1	roof	Point
MAU-SO-JKZF-08	roof fan	89	89	21,5	1	SO	1	roof	Point
AHU_SO_OCV_01	air handler	89	89	9,16	1	SO	1	facade	Point
AHU_SO_OCV_02	air handler	89	89	9,16	1	SO	1	facade	Point
AHU_SO_FXMT_03	air handler	89	89	9,16	1	SO	1	facade	Point
Systemair KD 200 L1	compressor	89	89	3,6	5	SO	5	facade	Point
Lindab WLS_89,2dB	vent	89,2	89,2	16,5	1	SO	3	facade	Point
				16,5	1	FO		facade	
				6,5	1	FO		facade	
AHU_SO_FXBZ_01	air handler	89	89	16,5	1	SO	1	facade	Point
AHU-FO-FRKF-01-02-03	air handler	93,8	93,8	19,94	1	FO	1	roof	Point
AHU-FO-FRKF-04-05-06	air handler	93,8	93,8	19,94	1	FO	1	roof	Point
AHU-FO-FRKF-07	air handler	89	89	19,94	1	FO	1	roof	Point

Noise source name	Noise source type	Sound power level (dB)		Height (m)	Item number	Building	Total number of items	Noise source location	Noise source nature of
		Daytime	At night						
AHU-FO-FRKF-08-09-10-11	air handler	95	95	19,94	1	FO	1	roof	Point
AHU-FO-FRKF-12	air handler	89	89	19,94	1	FO	1	roof	Point
AHU-FO-FRKF-13	air handler	89	89	19,94	1	FO	1	roof	Point
AHU-FO-FRKF-14-15	air handler	92	92	19,94	1	FO	1	roof	Point
AHU-FO-FRKF-16-17-18	air handler	93,8	93,8	19,94	1	FO	1	roof	Point
MAU-FO-CWJZ-01	roof fan	89	89	19,44	1	FO	1	roof	Point
MAU-FO-CWJZ-02	roof fan	89	89	19,44	1	FO	1	roof	Point
MAU-FO-CWJZ-03	roof fan	89	89	19,44	1	FO	1	roof	Point
MAU-FO-OCV-01	roof fan	89	89	19,44	1	FO	1	roof	Point
AHU-FO-GWJZ-01-02-03	air handler	93,8	93,8	19,94	1	FO	1	roof	Point
AHU-FO-GWJZ-04-05-06	air handler	93,8	93,8	19,94	1	FO	1	roof	Point
AHU-FO-GWJZ-07-08-09	air handler	93,8	93,8	19,94	1	FO	1	roof	Point
AHU-FO-ZPJC-01	air handler	89	89	22,49	3	FO	3	roof	Point
DHU-FO	air handler	89	89	19,94	13	FO	14	roof	Point
				19,94	1			roof	
Helios Air1 XC 700	air handler/winds Cook	89	89	4	4	FO	4	facade	Point
Helios Air1 XC 500	air handler/winds Cook	89	89	4,7	2	FO	2	facade	Point

Helios Air1 XC 3200	air handler/winds Cook	89	89	4,7	4	FO	4	facade	Point
Noise source name	**Noise source type**	**Sound power level (dB)**		**Height (m)**	**Item number**	**Building**	**Total number of items**	**Noise source location**	**Noise source nature of**
		Daytime	**At night**						
Helios Air1 XC 2200	air handler/winds Cook	89	89	3,7	2	FO	2	facade	Point
Lindab H	roof vent	91	91	19,44	2	FO	2	roof	Point
Lindab WLS_98,9dB	vent	98,9	98,9	17,61	2	PS	2	roof	Point
Lindab H exhaust head	roof vent	85,1	85,1	16,42	1	MU	1	roof	Point
Lindab H suction head	roof vent	85,1	85,1	16,42	1	MU	1	roof	Point
AHU_MU_01	central ventilation machine	52	52	17,42	1	MU	1	roof	Point
AHU_MU_02	central ventilation machine	51	51	17,42	1	MU	1	roof	Point
AHU_MU_03	central ventilation machine	64	64	17,42	1	MU	1	roof	Point
AHU_MU_04	central ventilation machine	55	55	17,42	1	MU	1	roof	Point
AHU_MU_05	central ventilation machine	58	58	17,42	1	MU	1	roof	Point
AHU_MU_06 (injection)	inflator ventilation machine	62	62	17,42	1	MU	1	roof	Point
AHU_MU_06 (extraction)	extractor ventilation	62	62	17,42	1	MU	1	roof	Point

	machine								
AHU_MU_07	central ventilation machine	65	65	17,42	1	MU	1	roof	Point
AHU_MU_08	central ventilation machine	67	67	17,42	1	MU	1	roof	Point
AHU_MU_09	central ventilation machine	55	55	17,42	1	MU	1	roof	Point
AHU_MU_12	central ventilation machine	67	67	17,42	1	MU	1	roof	Point
Noise source name	**Noise source type**	**Sound power level (dB)**		**Height (m)**	**Item number**	**Building**	**Total number of items**	**Noise source location**	**Noise source nature of**
		Daytime	**At night**						
AHU_MU_13 (injection)	inflator ventilation machine	65	65	17,42	1	MU	1	roof	Point
AHU_MU_13 (extraction)	extractor ventilation machine	63	63	17,42	1	MU	1	roof	Point
AHU_MU_14	central ventilation machine	56	56	17,42	1	MU	1	roof	Point
Clint_CHA_G_AF_WP	heat pump	92,8	92,8	17,42	2	MU	2	roof	Point
Lindab WLS_85,1dB	vent	85,1	85,1	8,5	1	RM	1	facade	Point
Nitrogen generator	nitrogen waste gas exit	85	85	17,25	5	PS	10	roof	Point
				17,61	5	PS		roof	
Cooling tower	Cooling tower fan	94,1	94,1	22,206	8	PS	16	roof	Point
				22,566	8	PS		roof	

type "A"	Cooling tower sidewall**	94,1	94,1	-	-	PS	-	roof	Interface
Cooling tower type "B"	Cooling tower fan	91,1	91,1	22,206	4	PS	12	roof	Point
				22,566	8	PS		roof	
	Cooling tower sidewall**	91,1	91,1	-	-	PS	-	roof	Interface
Cooling tower type "C"	Cooling tower fan	84,1	84,1	20,62	2	MU	2	roof	Point
	Cooling tower sidewall**	84,1	84,1	-	-	MU	-	roof	Interface
Cooling tower type "D"	Cooling tower fan	83,1	83,1	26,7	3	EN	3	roof	Point
	Cooling tower sidewall**	83,1	83,1	-	-	EN	-	roof	Interface
AHU_YLC-03-04	central ventilation machine	92	92	18,77	1	RM	1	roof	Point
Noise source name	**Noise source type**	**Sound power level (dB)**		**Height (m)**	**Item number**	**Building**	**Total number of items**	**Noise source location**	**Noise source nature of**
		Daytime	**At night**						
AHU_IQC_01	central ventilation machine	89	89	18,77	1	RM	1	roof	Point
AHU_YLC-05-06	central ventilation machine	92	92	18,77	1	RM	1	roof	Point
AHU_YLC-01-02	central ventilation machine	92	92	18,77	1	RM	1	roof	Point
DHU_KDFX	central ventilation machine	89	89	18,77	2	RM	2	roof	Point
Air Treatment AS	air handler	75	75	19,95	4	AS	4	roof	Point

Air management facade breakthrough**	air handler	75	75	-	63	AS	63	facade	Interface
AS building north facade**	technology building facade noise source	45	45	-	-	AS	-	entire façade	Interface
AS building south facade**	technology building facade noise source	45	45	-	-	AS	-	entire façade	Interface
AS building roof**	technology building noise source	45	45	-	-	AS	-	entire façade	Interface
EL building north facade**	technology building facade noise source	45	45	-	-	EN	-	entire façade	Interface
EL building east facade**	technology building facade noise source	45	45	-	-	EN	-	entire façade	Interface
Noise source name	**Noise source type**	**Sound power level (dB)**		**Height (m)**	**Item number**	**Building**	**Total number of items**	**Noise source location**	**Noise source nature of**
		Daytime	**At night**						
EL building south facade**	technology building facade noise source	45	45	-	-	EN	-	entire façade	Interface
EL building roof**	technology building noise source	45	45	-	-	EN	-	full roof	Interface

FO building north facade**	technology building facade noise source	45	45	-	-	FO	-	entire façade	Interface
FO building west facade**	technology building facade noise source	45	45	-	-	FO	-	entire façade	Interface
FO building south facade**	technology building facade noise source	45	45	-	-	FO	-	entire façade	Interface
FO building roof**	technology building noise source	45	45	-	-	FO	-	full roof	Interface
Transformer substation facade**	transformer r substation facade noise source	71,1	71,1	-	2	Transfor mator substatio n	2	entire façade	Interface
Daikin Sensira FTXF35C/RXF35C	split air conditioner	62	62	5,57	2	Transfor mator substatio n	2	roof	Point
Passenger car parking "A"	parking	93,7	84,6	-	284 places	-	-	-	Interface
Passenger car Parking "B"	parking	95,7	86,7	-	413 places	-	-	-	Interface
Noise source name	**Noise source type**	**Sound power level (dB)**		**Height (m)**	**Item number**	**Building**	**Total number of items**	**Noise source location**	**Noise source nature of**
		Daytime	**At night**						
Passenger car Parking "C"	parking	72,6	63,5	-	9 places	-	-	-	Interface
Passenger car Parking "D"	parking	72,6	63,5	-	9 places	-	-	-	Interface
Passenger car Parking "E"	parking	69	60	-	4 places	-	-	-	Interface

Lorry parking	parking	79,9	75,2	-	11 places	-	-	-	Interface
Internal transport	internal Transport	82,2	-	-	-	-	-	-	Line

** The noise model has been corrected for the radiated noise in IMMI 2024 software on a spatial basis.

The contractor shall apply a noise requirement for all its factories for air handling equipment providing ventilation for comfort purposes, whereby the sound power level of the equipment shall not exceed 75 dB. Thus, equipment to be purchased in the future will be installed in a noise attenuated design, if necessary.

For the cooling towers listed in the table above, the investor opted to use noise attenuated equipment, whereby the fan housing and fan blades were also noise attenuated, further reducing the expected noise impact and the additional noise impact on the nearest protected property. The side walls of the cooling towers have been included in the modelling as surface sources, as the different size of the equipment (units of varying module numbers) and the acoustic properties of the equipment better reflect the operating characteristics of the individual mechanical components. In the case of cooling towers, their location is justified by the location of the associated technology within the buildings. The cooling tower fan on top of the equipment has been considered as a point source of noise.

The calculations used in the modelling software are based on the ISO 9613-2 standard. The drawings in the Annex show the sound pressure levels associated with the equipment, which are taken from the equipment's logbooks.

For the cooling towers, due to the size of the equipment, the side walls of the equipment were included as a surface source in the noise model, where an area correction was applied. The fans on top of the equipment were included as point sources in the modelling, for which the area correction was not applied.

In the case of internal transport, the size of the resource means that the modelling software breaks it down into several segments in the calculations. The software applies a length proportional correction to the source based on the traffic data provided.

The equipment will be installed on the roofs and facades of the buildings concerned, as well as at ground level next to the buildings. The location of noise sources is shown in the figure below and in Annex 2.6.

45. Figure 1 Location of planned noise sources

A noise model for the proposed facility has been developed using the IMMI 2024 software. The software uses a method that produces results equivalent to those provided for in the MSZ 15036 standard and in Decree 93/2007 (XII. 18.) of the Ministry of Transport and Public Works on the method of establishing noise emission limits and the method of monitoring noise and vibration emissions. The calculations take into account the maximum noise emission operating conditions that regularly occur.

The noise propagation calculations were carried out in accordance with Annex 11, point 4 of Decree 93/2007 (XII. 18.) of the Ministry of Transport, Building and Urban Affairs, "Procedure for calculating noise exposure from individual sound sources".

$$L_t = L_W + K_{Ir} + K_\Omega - K_d - K_L - K_m - K_n - K_B - K_e$$

Where:

L_w [dB(A)] Equivalent emission value of sub-source A

$K_{ir+K\Omega}$ [dB] Square angle value+ Orientation degree+ Ground reflection (frequency independent)

K_d [dB] Distance rate

K_L [dB] Air absorption rate

K_m [dB] Attenuation due to ground effect in dB

$_{Kn}$ [dB] Vegetation attenuation $_{KB}$ [dB]

Vegetation $_{Ke}$ [dB] Attenuation of noise

attenuation

The calculated noise exposure values for the hypothetical worst-case points considered in the modelling are shown in the table below. More detailed data can be found in the site plan in Annex 2.8 and in the table in Annex 1.23.

123. Table 2: Calculated noise exposure results [dB(A))

Name to be protected	Calculation result		Threshold	
	Daytime	At night	Daytime	At night
Ágnes farm, 0237/258	31,0	30,9	50	40
Józsa, 53252/7	33,9	33,7	50	40
Kismacs, 65004	24,7	23,8	50	40
Kismacs, 65007	24,0	23,3	50	40
Kismacs, 65008	19,1	18,7	50	40
Kismacs, 65009	17,2	16,9	50	40
Kismacs, 65010	25,0	24,2	50	40
Kismacs, 65011	23,6	23,0	50	40
Kismacs, 65012	26,2	25,4	50	40
Kismacs, 65013	26,1	25,2	50	40
Kismacs, 65014	18,3	17,9	50	40
Kismacs, 65015	26,1	25,3	50	40
Kismacs, 65016	26,1	25,3	50	40
Kismacs, 65017	26,0	25,2	50	40
Small Catfish-Petersian shoot, 0263/10	30,9	29,9	50	40
Small Catfish-Petersburg, 0263/3	27,6	26,6	50	40
Small catfish-Peterfiad shoot, 0263/4	29,8	28,7	50	40
Small catfish-Peterfiad shoot, 0263/6	30,6	29,5	50	40
Small Catfish-Petersburg, 0263/8	31,7	30,7	50	40
Big Mach, 0288/38	32,5	32,4	50	40
Nagymacs, 67007	30,9	30,4	50	40
Sightseeing Bar, 0316/58	28,6	27,7	50	40
Nagymacs, 0292/1	33,2	32,7	50	40
Nagymacs, 67293	31,6	31,2	50	40
Small cat, 65035/2	26,1	25,2	50	40
Józsa, 53255/3	33,9	33,7	50	40

The calculation results show that the installation can comply with the noise limits at the points tested.

Based on the calculations presented in the documentation, no loads exceeding the noise protection limit are expected, therefore no further noise mitigation is justified. Regular monitoring of compliance with the limit values is recommended, by means of noise measurements at defined intervals and at defined points. Based on the results of the noise measurements, additional measures and interventions can be implemented if justified.

Noise during the operation of the installation for which no noise exposure limit value can be applied (e.g. recreational noise, disturbing frequencies) cannot be expected on the basis of the information provided by the applicant and the designer.

Based on the information provided by the Permittee and the Designer, the operation of noise sources associated with normal operations outside of normal operations, other than diesel pumps, is not expected to occur at the facility. The noise exposure of the diesel pumps, which are part of the fire protection system and are required to be started for 0.5 hours per month, was modelled as continuous operation in favour of safety. Exercise by the facility fire brigade is an occasional source of noise with no significant noise exposure, and is scheduled for no more than 12 times per year. The noise impact of this activity and the once-a-year industrial safety drill could not be taken into account in the noise calculations, but based on the information provided by the Licensee, these activities will not result in significant noise impacts and will not significantly affect the maximum noise impact of the facility as shown above.

Noise impacts in the event of a nuisance are not considered to be a regular operational noise. Noise from rescue activities is not covered by the legislation, and it should also be pointed out that the duration of this noise is short in relation to the total operating time, and the noise generated will decay quickly.

7.9.5.2. Examination of cumulative impacts

IGPark Debrecen, the logistics hall development of IGPark DN Real Estate Development Ltd., is part of the North-Western Economic Belt Supplier Park, located east of Eve Power Hungary Kft. In connection with the planned IGPark Debrecen and Eve Power Hungary Kft. facility, the possibility of simultaneous construction cannot be ruled out, so an assessment of the cumulative effects of the construction works is necessary. The IGPark is planned to be built during the daytime, and the noise impact and the cumulative effects of the works are presented in the table below.

124. Table 1: Co-loading rate with background load at the points under consideration for construction

Name to be protected	Calculated noise exposure of own site daytime (dB)	IGPark calculated noise exposure daytime (dB)	Aggregated noise exposure daytime (dB)	Rate of increase by day (dB)
Nagymacs, 65035/2	40,6	27,9	40,8	0,2
Józsa, 53255/3	41,0	39,6	43,4	2,4

We do not have any environmental information on the development of the Schedl Hungária Kft. car wheel assembly plant in the North-West Economic Belt of Debrecen. The assessment of the cumulative impacts was therefore based on the assumption that the Schedl Hungária Kft. plant will cause the same or lower noise impact than the Panattoni Hungary Development Kft. production hall, as the two plants are planned to continue similar activities (Schedl Hungária Kft. car wheel assembly plant, Panattoni Hungary Development Kft. road vehicle parts production plant).

To the south of the facility is the development area of BMW Manufacturing Hungary Kft.
a road vehicle manufacturing plant and a painting plant are planned. Information provided by the Environmental Protection Agency

data have been used to determine the impact of the installation on some specific protected sites, which are presented in the table below.

125. Table 1 Expected area of influence and noise exposure (at night) in front of the facades to be protected for the BMW painting plant

Test point	Large cat, 67007 cadastral parcel	Small cat, 65013 cadastral parcel	Józsa, 53252/7 parcel	Scope
BMW painting plant noise exposure at night (dBA)	27,5	30,5	31,2	Extent of the operational area from the centre of the painting plant building in a westerly and northerly direction ~ 1600 metres, ~1500 metres to the east and ~1400 metres to the south. It does not cover inhabited areas

126. Table 1 Expected noise exposure (day and night) in front of the facades to be protected for the BMW road vehicle plant

Hrsz.	BMW road vehicle production plant noise exposure during the day (dB)	BMW road vehicle manufacturing plant noise exposure at night (dB)
Kismacs, 65002	22,6	20,1
Kismacs, 65003	22,7	20,2
Kismacs, 65004	22,7	20,3
Little Cat, 65040	10,3	8,1
Little Cat, 65041	9,2	6,7
Small cat, 65042	9,4	6,8
Small cat, 65043	10	7,4
Small cat, 65044	10,6	8
Small cat, 65045	8,8	6,4
Small cat, 65046	12,3	9,6
Small cat, 65047	17,8	15,9
Small cat, 65048/10	22,5	20,1
Small cat, 65048/9	22,1	19,7
Small town, 65050	11,6	9,1

The boundary of the footprint for operation is the limit of immission (30 dB) at 10 dB below the night-time limit for operation. The footprint of the BMW road vehicle production plant does not affect any buildings to be protected.

To the east of the planned Eve Power Hungary Kft. facility is the North-Western Economic Belt Supplier Park, which includes the development area of Panattoni Hungary Development Kft., where a plant for the production of road vehicle components is planned. Based on the information provided by the Environmental Protection Agency, the impact of the installation on certain identified protected sites has been assessed and is presented in the table below.

127. Table 1 Expected area of influence and noise exposure (at night) in front of the facades to be protected in the area of Panattoni Hungary Development Kft.
for a production hall

Test point	Noise pollution at night (dBA)

In a westerly direction, in the Nagymacs part of Debrecen, to the E of Kastélykert Street, on the on the boundary of the "Lk" - small urban residential zones, which have been reclassified under the current regulatory plan, but are currently still largely undeveloped, close to the planning area	<10
Test point	**Noise pollution at night (dBA)**
in a north-north-easterly direction, in the Debrecen-Józsa part of the settlement, "Lke" - suburban residential area 2 m in front of the facades of the detached houses with gardens on the west side of Elek Street, in zone 2	11
In an easterly direction, in the suburban part of Debrecen, in the "Má" - general agricultural area zone, on the property 0237/258 hrsz (Ágnes farm), a farm building is to be protected. 2 m in front of the facade	12
Panattoni Hungary Development Kft. production hall area	
Maximum area of influence in westerly direction	230 m
North-Northeast largest area of influence	230 m
Maximum area of influence in an easterly direction	142 m
Maximum area of influence in a southerly direction	230 m

IGPark Debrecen, the logistics hall development of IGPark DN Real Estate Development Ltd., is also part of the supplier park of the North-West Economic Belt, located east of the planned Eve Power Hungary facility. The calculated noise impact of the project is shown in the table below.

128. Table 1: Expected noise exposure (day and night) in front of the facades to be protected for IGPark

Hrsz.	IGPark noise exposure during the day (dB)	IGPark noise exposure at night (dB)
Nagymacs, 67293	4,9	4,6
Sightseeing Bar, 0316/58	N.E.*	N.E.*
Small cat, 65035/2	0,1	N.E.*
Small Catfish-Petersburg, 0263/8	2,8	1,0
Józsa, 53255/3	15,6	14,8

*N.I. - based on the results of the previous modelling, the calculated load at that point is so low that the result is not meaningful.

We do not have any environmental information on the development of the Schedl Hungária Kft. car wheel assembly plant in the North-West Economic Belt of Debrecen. The assessment of the cumulative impacts was therefore based on the assumption that the Schedl Hungária Kft. plant will cause the same or lower noise impact than the Panattoni Hungary Development Kft. production hall, as the two plants are planned to continue similar activities (Schedl Hungária Kft. car wheel assembly plant, Panattoni Hungary Development Kft. road vehicle parts production plant).

The calculations based on the above data, combined with the known noise exposure of other facilities in the surrounding economic areas, are presented in the table below. As can be seen, the planned installation, when combined with the noise exposure of the other sites provided as data, does not cause any exposure above the limit values for the protected sites under consideration.

129. Table 1 The combined load with background load at the points tested

Name to be protected	Calculated noise exposure of own site (dB)		BMW calculated noise exposure (dB)		Calculated noise exposure of Panattoni (dB)	IGPark calculated noise exposure (dB)	Schedl Estimated noise exposure of Hungária Kft (dB)		Aggregated noise exposure (dB)		Rate of increase (dB)	
	Daytime	At night	Daytime	At night	At night	Daytime	At night	At night	Daytime	At night	Daytime	At night
Agnes farm, 0237/258	31,0	30,9	-	-	12	-	-	12	31,0	31,0	-	0,1
Józsa, 53252/7	33,9	33,7	-	31,2	11	-	-	11	33,9	35,7	-	4,4
Kismacs, 65004	24,7	23,8	22,7	20,3	-	-	-	-	26,8	25,4	4,1	5,1
Kismacs, 65013	26,1	25,2	-	30,5	-	-	-	-	26,1	31,6	-	1,1
Small cat-Peter's shooter, 0263/10	30,9	29,9	33,9	28,4	-	-	-	-	35,7	32,2	1,8	3,8
Small cat-Peter's shooter, 0263/3	27,6	26,6	32,6	26,3	-	-	-	-	33,8	29,5	1,2	3,2
Small cat-Peter's shooter, 0263/4	29,8	28,7	32,8	26,5	-	-	-	-	34,6	30,8	1,8	4,3
Small cat-Peter's shooter, 0263/6	30,6	29,5	33,5	27,8	-	-	-	-	35,3	31,8	1,8	4,0
Small cat-Peter's shooter, 0263/8	31,7	30,7	34,8	29,2	-	2,8	1,0	-	36,5	33,0	1,7	3,8
Nagymacs, 67007	30,9	30,4	-	27,5		-	-		30,9	32,2	-	4,7
Nagymacs, 0292/1	33,2	32,7	-	-	10	-	-	10	33,2	32,7	-	-
Nagymacs, 67293	31,6	31,2	-	-	-	4,9	4,6	-	31,6	31,2	-	-
Small cat, 65035/2	26,1	25,2	-	-	-	0,1	N.E.*	-	26,1	25,2	-	-
Józsa, 53255/3	33,9	33,7	-	-	-	15,6	14,8	-	34,0	33,8	0,1	0,1

*N.I. - based on the results of the previous modelling, the calculated load at that point is so low that the result is not meaningful.

7.9.5.3. Traffic noise

The noise impact of traffic on the roads leading to the site during the period of operation is described in the table below.

130. Table 2: Calculation results of the baseline noise exposure of the road sections under study for the operational period (2027)

		M35 motorway north	M35 motorway south	Highway 33	Route 354	Northern access About M35	BMW Boulevard North	BMW Boulevard East	BMW Boulevard West	BMW Boulevard South
Nearest parcel to be protected.		53377 (Rose Valley Street 240.)	0356/2	65040/1 (Greenfield u. 2.)	0249/4 (Varga farm)	53255/3 (215 Elek street)	0237/258 (Ágnes farm)	0249/6 (Márton Domokos garden 51.)	0263/8 (Peter's Day 5.)	0249/6 (Márton Domokos garden 51.)
Distribution of excess traffic on the road section	**I**	25%	15%	25%	10%	25%	100%	25%	25%	25%
	II	25%	25%	0%	10%	25%	100%	25%	25%	25%
	III	35%	35%	0%	0%	35%	100%	35%	0%	35%
Calculated noise exposure at reference distance	**Daytime**	76,3 dB(A)	76,4 dB(A)	70,3 dB(A)	72,4 dB(A)	71,0 dB(A)	58,5 dB(A)	69,2 dB(A)	55,8 dB(A)	70,2 dB(A)
	At night	69,4 dB(A)	69,5 dB(A)	60,9 dB(A)	62,1 dB(A)	62,7 dB(A)	49,7 dB(A)	60,9 dB(A)	46,9 dB(A)	61,9 dB(A)
Calculated noise exposure at the property to be protected	**Daytime**	49,9 dB(A)	52,6 dB(A)	55,3 dB(A)	44,3 dB(A)	43,7 dB(A)	27.1 dB(A)	40,3 dB(A)	23,1 dB(A)	45,2 dB(A)
	At night	43,0 dB(A)	45,7 dB(A)	45,9 dB(A)	34,0 dB(A)	35,4 dB(A)	18.2 dB(A)	32,0 dB(A)	14.1 dB(A)	36,9 dB(A)

The calculated values clearly show that, under the current traffic data and speed limits, no loads exceeding the noise limits are expected to occur along the road sections under consideration on the study section potentially affected by the project, for the protected areas along the road sections under consideration.

The expected increase in traffic arriving in the area will take the form of 1,274 cars and 170 heavy goods vehicles and 38 buses per day (taking into account two-way traffic).

The resulting increase of 0.1 dB is below the limit of human perception (0.5 dB) for the main road 33, road 354, the northern access road to the M35 motorway, the eastern section of the BMW Boulevard, the southern section of the BMW Boulevard and the expected loads at the protected sites are below the limit. The increases of 2.4 dB and 4.1 dB for the northern section of BMW Boulevard and 0.7 dB and 2.4 dB for the western section of BMW Boulevard represent a perceptible change, but the expected exposure of the protected persons remains below the limit. Taking into account the background noise levels at the protected sites, the generated noise increment will not lead to a significant change in the perceived actual exposure.

According to § 7 of Government Decree 284/2007 (X.29.):

"(1) The scope of the transport activity necessary for the installation and realisation of a new activity is the area adjacent to the transport routes to be protected from noise, in which the transport activity causes an additional noise impact of at least 3 dB.

(2) The scope referred to in paragraph 1 shall be determined for transport, haulage and transport operations which

a) a national road or on a local road on a primary or secondary arterial road within the country, and

b) the basic activity is subject to an environmental impact assessment or a single environmental permit.

(3) For the purposes of determining the area of influence referred to in paragraph 1, the assessment of the noise contribution along transport routes shall be carried out within a maximum distance of 25 km from the location of the basic activity.

(4) The area of influence within the meaning of paragraph 1 shall be determined on the basis of the latest available average daily traffic data per year recorded by the road manager and on the basis of the expected maximum daily traffic of the transport activity, calculated in accordance with a separate legal act."

As the areas adjacent to the northern section of the BMW ring road, where the night-time increment is 4.1 dB, i.e. more than 3 dB, are not to be protected from noise, it is not necessary to define the area of influence of the transport activity.

131. Table 1: Calculated noise exposure in the vicinity of the roads under study during the operational period [dB (A)] (2027)

Co-loading with increment		M35 motorway north	M35 motorway south	Highway 33	Route 354	Northern access About M35	BMW Boulevard North	BMW Boulevard East	BMW Boulevard West	BMW Boulevard South
Nearest parcel to be protected.		53377 (Rose Valley Street 240.)	0356/2	65040/1 (Greenfield u. 2.)	0249/4 (Varga farm)	53255/3 (215 Elek street)	0237/258 (Ágnes farm)	0249/6 (Márton Domokos garden 51.)	0263/8 (Peter's Day 5.)	0249/6 (Márton Domokos garden 51.)
Calculated noise exposure at reference distance	**Daytime**	76,3	76,5	70,3	72,4	71,1	60,9	69,2	56,5	70,3
	At night	69,4	69,5	61,0	62,2	62,8	53,8	61,0	49,3	62,0
Calculated noise exposure at the property to be protected	**Daytime**	49,9	52,6	55,3	44,3	43,7	29,4	40,3	23,8	45,3
	At night	43,0	45,7	46,0	34,1	35,5	22,3	32,1	16,6	37,0
Rate of increase	**Daytime**	0,0	0,0	0,0	0,0	0,1	2,4	0,1	0,7	0,1
	At night	0,0	0,0	0,1	0,1	0,1	4,1	0,1	2,4	0,1

7.9.6. Impacts in the long term

The long-term noise impact of traffic on the road sections concerned is presented in the table below.

132. Table 1: Calculation results of the baseline noise exposure of the road sections under study in the long term (2042)

		M35 motorway north	M35 motorway south	Highway 33	Route 354	Northern access About M35	BMW Boulevard North	BMW Boulevard East	BMW Boulevard West	BMW Boulevard South
Nearest parcel to be protected.		53377 (Rose Valley Street 240.)	0356/2	65040/1 (Greenfield u. 2.)	0249/4 (Varga farm)	53255/3 (215 Elek street)	0237/258 (Ágnes farm)	0249/6 (Márton Domokos garden 51.)	0263/8 (Peter's Day 5.)	0249/6 (Márton Domokos garden 51.)
Distribution of excess traffic on the road section	**I**	25%	15%	25%	10%	25%	100%	25%	25%	25%
	II	25%	25%	0%	10%	25%	100%	25%	25%	25%
	III	35%	35%	0%	0%	35%	100%	35%	0%	35%
Calculated noise exposure at reference distance	**Daytime**	77,3 dB(A)	77,5 dB(A)	71,1 dB(A)	73,1 dB(A)	72,3 dB(A)	59,2 dB(A)	70,4 dB(A)	56,4 dB(A)	71,3 dB(A)
	At night	70,4 dB(A)	70,5 dB(A)	61,7 dB(A)	63,0 dB(A)	64,0 dB(A)	50,4 dB(A)	62,2 dB(A)	47,5 dB(A)	63,0 dB(A)
Calculated noise exposure at the property to be protected	**Daytime**	51,0 dB(A)	53,7 dB(A)	56,1 dB(A)	45,0 dB(A)	44,9 dB(A)	27,7 dB(A)	41,5 dB(A)	23,7 dB(A)	46,3 dB(A)
	At night	44,0 dB(A)	46,7 dB(A)	46,7 dB(A)	34,9 dB(A)	36,6 dB(A)	18,9 dB(A)	33,2 dB(A)	14,8 dB(A)	38,0 dB(A)

Over the 15-year time horizon, the general increase in traffic and the traffic generated by the installation will not result in an exceedance of the noise limit for the protected areas in the vicinity of the road sections concerned.

133. Table 1: Expected increase in noise exposure due to traffic growth in the long term [dB (A)]

Co-loading with increment		M35 motorway north	M35 motorway south	Highway 33	Route 354	Northern access About M35	BMW Boulevard North	BMW Boulevard East	BMW Boulevard West	BMW Boulevard South
Nearest parcel to be protected.		53377 (Rose Valley Street 240.)	0356/2	65040/1 (Greenfield u. 2.)	0249/4 (Varga farm)	53255/3 (215 Elek street)	0237/258 (Ágnes farm)	0249/6 (Márton Domokos garden 51.)	0263/8 (Peter's Day 5.)	0249/6 (Márton Domokos garden 51.)
Calculated noise exposure at reference distance	**Daytime**	77,4	77,5	71,1	73,2	72,3	61,3	70,5	57,0	71,4
	At night	70,4	70,5	61,8	63,0	64,1	54,1	62,2	49,7	63,1
Calculated noise exposure at the property to be protected	**Daytime**	51,0	53,7	56,1	45,1	44,9	29,9	41,6	24,3	46,3
	At night	44,0	46,7	46,8	34,9	36,7	22,6	33,3	16,9	38,1
Rate of increase	**Daytime**	0,0	0,0	0,0	0,0	0,0	2,1	0,1	0,6	0,0
	At night	0,0	0,0	0,1	0,1	0,1	3,7	0,1	2,2	0,1

The calculated values show that, under the current traffic data and speed limits, no loads exceeding the noise limits are expected to occur on the studied section potentially affected by the project, for the protected areas along the studied road sections. In the long term, the increases for the road sections under consideration do not exceed the limit value, but for the northern and western sections of the BMW ring road the increase is noticeable (above 0.5 dB).

According to § 7 of Government Decree 284/2007 (X.29.):

"(1) The scope of a transport activity necessary for the installation and realisation of a new activity shall be the area adjacent to the transport routes to be protected from noise where the transport activity causes an additional noise impact of at least 3 dB.

(2) The scope referred to in paragraph 1 shall be determined for transport, haulage and transport operations which

a) a national road or on a local road on a primary or secondary arterial road within the country, and

b) the basic activity is subject to an environmental impact assessment or a single environmental permit.

(3) For the purpose of determining the area of influence referred to in paragraph 1, the assessment of the noise contribution along transport routes shall be carried out within a maximum distance of 25 km from the location of the basic activity.

(4) The area of influence within the meaning of paragraph 1 shall be determined on the basis of the latest available average daily traffic data per year recorded by the road manager and on the basis of the expected maximum daily traffic of the transport activity, calculated in accordance with a separate legal act."

As the areas adjacent to the northern section of the BMW ring road, where the night-time increment is 3.7 dB, i.e. more than 3 dB, are not to be protected from noise, it is not necessary to define the area of influence of the transport activity.

Future technical developments that are not yet in general use in Hungary (e.g. quieter tyres, quieter wear layer, the rise of electric vehicles).

7.9.7. Vibration protection effects of operation

During the period of operation, the various mechanical equipment (pumps, compressors, etc.) and traffic within the facility will have a vibration-generating effect. In the former case, it should be stressed that all machinery that will be exposed to vibration during operation will be adequately damped to avoid significant vibration loads being transmitted to the floor or building structure. Reducing the vibration load is also a fundamental requirement of precision engineering, and it is in the Licensee's best interest to maintain this at all times. Given that the level of vibration associated with machinery and equipment is minimised locally through engineering interventions, it is unlikely that the above-mentioned limit values will be exceeded beyond the site boundary.

Given the 20 km/h speed limit that will be imposed for traffic within the facility in the internal area, and the appropriate pavement structure, the likelihood of noticeable noise impacts beyond the boundary of the planning area is low.

7.9.8. Effects during the winding-up period

There are no plans to close the facility in the near future. If it were to take place, expected noise and vibration impacts would be similar to those presented during the construction period (Sections 7.9.3.1 and 7.9.4), but not expected to exceed those resulting from the demolition of the building structures and the removal of the installed infrastructure.

7.9.9. Delimitation of the area covered

7.9.9.1. Direct coverage

The construction activity is expected to take more than 1 year, and is planned to be carried out during the night. In view of this, the noise limit value for the nearest protected objects is 40 dB.

According to the provisions of Article 6(a) of Government Decree 284/2007 (29.X.), the boundary of the noise protection zone of an installation (the environmental noise source zone) is the line where the noise exposure from the noise source is 10 dB below the noise exposure limit value, if the background noise exposure is also at least 10 dB below the limit value. The maximum level of background noise exceeds 30 dB.

According to the provisions of Article 6(b) of the Government Decree, the boundary of the zone of influence is the line where the noise exposure from the noise source equals the background exposure if the background exposure is less than the noise exposure limit value, but this difference is not greater than 10 dB. In our case, the background exposure ranges between 33 and 40 dB for the protected areas under consideration. Therefore, this point of the legislation has been applied in the delimitation in the direction of the municipalities of Józsa and Nagymacs.

According to the provisions of Article 6(d) of the Government Decree, the boundary of the zone of influence is the line where the noise exposure from the noise source in an environment not to be protected from noise, excluding economic areas, is equal to the noise exposure limit value for the noise source in a recreational area. In this case, the relevant value of 35 dB has been taken into account towards the general economic classification areas associated with agricultural and industrial activities in the vicinity of the planning area.

According to this delimitation, the maximum noise footprint of the installation during the construction period from the site boundary is given below, by skyline. Based on the results of the modelling, the impact area will be residential to the west and north-east farm properties with residential functions to the east and south, located in areas classified as agricultural and forest.

134. Table 1: Extent of the noise footprint by sky by construction period

Landscape	Distance (km)
North	2,1
North East	2
East	2,22
South East	2,22
South	2,5
South West	2,25
West	2,9
North West	2

During the period of operation, the noise impact area can be calculated according to the provisions of Article 6 of Government Decree 284/2007 (X. 29.), as follows.

Article 6 of Government Decree 284/2007 (X. 29.)

- point a):
  - 10 dB lower than the noise exposure limit value if the background noise exposure is also at least 10 dB lower than the limit value - not applicable, as the measured background noise exposure at the points exceeds 30 dB for areas with a noise sensitive function during the period of operation.
- point b):
  - equal to the background exposure if the background exposure is less than the noise exposure limit value, but this difference is not greater than 10 dB - may be applied, since the measured background exposure value at noise measurement point 0292/1 Nagymacs was 32,1 dB, while the calculated value at the same point was 32,7 dB.
- point c):
  - equal to the noise exposure limit if the background exposure is greater than the limit - not applicable as the measured background exposure values did not exceed the limit at any point
- point d):
  - in an environment not subject to noise protection, except for economic areas, is equal to the noise exposure limit for a recreational area - in our case, the relevant value of 35 dB has been taken into account for the general economic classification of agricultural and industrial activities in the vicinity of the planning area. In the case of Nagymacs 0288/38 parcel and Józsa and Kismacs, the boundary delimited on the basis of the background noise levels measured on 20-21 June 2024 does not affect the areas to be protected, and therefore the boundary for agricultural areas pursuant to Article 6(d) of the Noise Ordinance was delimited (Article 6(b) of the Noise Ordinance was applied in the case of Nagymacs 0292/1 parcel and its surroundings).

- point e):
  - 55 dB during the day (6:00-22:00) and 45 dB at night (6:00-22:00) in the part of the economic areas not to be protected against noise - applicable in the direction south of the investment area towards the BMW investment area

In the case of the areas of Debrecen Kismacs to be protected, the provisions of Article 6 a-d of Government Decree 284/2007 (X. 29.) cannot be interpreted in the sense of the above, so the delimitation was in this direction on the basis of point e). No changes to the previous delimitation are necessary, so the protected areas here are not affected by the scope of the project.

According to this delimitation, the maximum expected noise footprint of the installation during the period of operation from the site boundary is given below, by skyline. Based on the results of the modelling, the agricultural areas of Debrecen, 0288/38, 0237/258, which are to be protected, are affected by the area of influence that can be delimited to the non-protected environment, but it does not reach the part of the agricultural area where the buildings to be protected are located.

The noise footprint of the project has been delineated on the basis of background noise at night, as it is larger than the daytime footprint.

135. Table 1: Extent of the noise footprint by sky by time of operation

Landscape	Distance (km)
North	1,44
North East	1,3
East	1,53
South East	0,28
South	0,41
South West	1,74
West	1,41
North West	1,21

7.9.9.2. Indirect coverage

From a noise protection point of view, the definition of the indirect footprint is based on the physical characteristics of the noise effects and the
the physical characteristics of noise propagation make it impossible to interpret.

7.9.9.3. Properties within the boundary

For the construction, the land parcel numbers of the properties within the calculated area of influence, which are located in the inner area or are to be protected, have been obtained.

Detailed site plans showing the noise impact area of the project are attached as Annex 2.11 (from Debrecen-Józsa and Debrecen-Nagymacs).

The properties concerned by the construction .

136. Table 1: Properties affected by the construction works, located in the interior or to be protected

Hrsz	Address	Settlement zoning	Register of buildings	To be protected
26783/1	Road	-	2112	No
53252/6	Elek u. 224.	Lke	-	No

Hrsz	Address	Settlement zoning	Register of buildings	To be protected
53252/7	Elek u. 224/C	Lke	1110	Yes
53252/8	Elek u. 224/D	Lke	1110	Yes
53252/10	Elek u. 224/B.	Lke	1110	Yes
53254/2	-	Lke	-	No
53255/3	215 Elek u.	Lke	1110	Yes
26418	Road	-	2112	No
53253/1	Road	-	2112	No
53253/2	Road	-	2112	No
67001/1	Kastélykert u. 2/J	Lf	1110	Yes
67001/2	Kastélykert u. 2/B	Lf	1110	Yes
67001/3	Kastélykert u. 2/G	Lf	1110	Yes
67001/4	Kastélykert u. 2/F	Lf	1110	Yes
67001/5	Castle Garden u. 2/C	Lf	1110	Yes
67001/6	Arató u. 59.	Lf	1110	Yes
67001/7	Undeveloped	Lf	-	Undeveloped
67001/8	55 Arató u.	Lf	1110	Yes
67001/9	Arató u. 53.	Lf	1110	Yes
67001/10	Arató u. 51.	Lf	1110	Yes
67001/11	Arató u. 49.	Lf	1110	Yes
67001/12	Arató u. 47.	Lf	1110	Yes
67001/13	Arató u. 45.	Lf	1110	Yes
67001/14	Arató u. 43.	Lf	1110	Yes
67001/15	Arató u. 41.	Lf	1110	Yes
67001/16	Arató u. 39.	Lf	1110	Yes
67001/17	Road	-	2112	No
67002	Road	-	2112	No
67004	Castle Garden u. 4/A	Lf	1110	Yes
67005/1	Castle Garden u. 4/B	Lf	1110	Yes
67005/2	Undeveloped	Lf	-	Undeveloped
67006	Castle Garden 2.	Lf	1110	Yes
67007	Kastélykert u. 8.	Lf	1110	Yes
67008	Kastélykert u. 10.	Lf	1110	Yes
67009	Kastélykert u. 12.	Lf	1110	Yes
67010	Kastélykert u. 14.	Lf	1110	Yes
67011	Kastélykert u. 16.	Lf	1110	Yes
67012	Kastélykert u. 18.	Lf	1110	Yes
67013/1	Kastélykert u. 20.	Lf	1110	Yes
67013/2	Macsi u. 2.	Lf	1110	Yes

Hrsz	Address	Settlement zoning	Register of buildings	To be protected
67014	Macsi u. 4.	Lf	1110	Yes
67015	Macsi u. 6.	Lf	1110	Yes
67016	Macsi u. 8.	Lf	1110	Yes
67017	Arató u. 54.	Lf	1110	Yes
67018/1	Undeveloped	Lf	-	Undeveloped
67018/2	Arató u. 50.	Lf	1110	Yes
67019	Macsi u. 10.	Lf	1110	Yes
67020	Road	-	2112	No
67021	Macsi u. 9.	Lf	1110	Yes
67022	Arató u. 48.	Lf	1110	Yes
67023	Arató u. 46.	Lf	1110	Yes
67024	Macsi u. 7.	Lf	1110	Yes
67025	Macsi u. 5.	Lf	1110	Yes
67026	Macsi u. 3.	Lf	1110	Yes
67027	Macsi u. 1.	Lf	1110	Yes
67028	Kastélykert u. 22.	Lf	1110	Yes
67029	Castle Garden u. 24.	Lf	1110	Yes
67030	Castle Garden u. 26.	Lf	1110	Yes
67031	Kastélykert u. 28.	Lf	1110	Yes
67032	Kastélykert u. 30.	Lf	1110	Yes
67033	Castle Garden u. 32.	Lf	1110	Yes
67034	Ondódi u. 2.	Lf	1110	Yes
67035	Ondódi u. 6.	Lf	1110	Yes
67036	Ondódi u. 8.	Lf	1110	Yes
67037	Ondódi u. 10.	Lf	1110	Yes
67038	Ondódi u. 12.	Lf	1110	Yes
67039	Arató u. 44.	Lf	1110	Yes
67040	Arató u. 42.	Lf	1110	Yes
67041/1	Ondódi u. 14.	Lf	1110	Yes
67041/2	-	Lf	2420 - Waste water transfer station	No
67042	Road	-	2112	No
67043	38 Arató u.	Lf	1110	Yes
67044	Arató u. 36.	Lf	1110	Yes
67045	Arató u. 34.	Lf	1110	Yes
67046	Ondódi u. 13.	Lf	1110	Yes
67047	Ondódi u. 11.	Lf	1110	Yes
67048	Ondódi u. 9.	Lf	1110	Yes

Hrsz	Address	Settlement zoning	Register of buildings	To be protected
67049	Ondódi u. 7.	Lf	1110	Yes
67050	Ondódi u. 5.	Lf	1110	Yes
67051	Ondódi u. 5/A	Lf	1110	Yes
67052	Ondódi u. 3.	Lf	1110	Yes
67053/1	Castle Garden u. 32/B	Lke	1110	Yes
67053/2	Ondódi u. 1/A	Lke	1110	Yes
67054	Castle Garden u. 32/C	Lke	1110	Yes
67055	Kastélykert u. 32/D.	Lke	1110	Yes
67056	Kastélykert u. 34.	Lke	1110	Yes
67057	Castle Garden u. 36.	Lke	1110	Yes
67058	Kastélykert u. 38.	Lke	1110	Yes
67059	Kastélykert u. 40.	Lke	1110	Yes
67060	Lomb u. 4.	Lke	1110	Yes
67061	Lomb u. 6.	Lke	1110	Yes
67062	Lomb u. 8.	Lke	1110	Yes
67063	Lomb u. 10.	Lke	1110	Yes
67064	Lomb u. 12.	Lke	1110	Yes
67065	Lomb u. 14.	Lke	1110	Yes
67066	Lomb u. 16.	Lke	1110	Yes
67067	Lomb u. 18.	Lke	1110	Yes
67068	Lomb u. 20.	Lke	1110	Yes
67069	Lomb u. 22.	Lke	1110	Yes
67070	Lomb u. 24.	Lke	1110	Yes
67071	Lomb u. 26.	Lke	1110	Yes
67072	Arató u. 32.	Lf	1110	Yes
67073	Arató u. 30.	Lf	1110	Yes
67074	Arató u. 28.	Lf	1110	Yes
67075	Arató u. 26.	Lf	1110	Yes
67076	Road	-	2112	No
67077	Lomb u. 27.	Lke	1110	Yes
67078	Arató u. 22.	Lke	1110	Yes
67079	Arató u. 20.	Lke	1110	Yes
67080	Arató u. 18.	Lke	1110	Yes
67081	Arató u. 16.	Lke	1110	Yes
67082	Arató u. 14.	Lke	1110	Yes
67083	Arató u. 12.	Lke	1110	Yes
67084	Arató u. 10.	Lke	1110	Yes
67085	Arató u. 8.	Lke	1110	Yes

Hrsz	Address	Settlement zoning	Register of buildings	To be protected
67086	Arató u. 6.	Lke	1110	Yes
67087	Gyümölcs u. 20.	Lke	1110	Yes
67088	Gyümölcs u. 18.	Lke	1110	Yes
67089	Gyümölcs u. 16.	Lke	1110	Yes
67090	Gyümölcs u. 14.	Lke	1110	Yes
67091	12 Gyümölcs u.	Lke	1110	Yes
67092	10 Gyümölcs u.	Lke	1110	Yes
67093	Gyümölcs u. 8.	Lke	1110	Yes
67094	Gyümölcs u. 6.	Lke	1110	Yes
67095	Gyümölcs u. 4.	Lke	1110	Yes
67096	Gyümölcs u. 2.	Lke	1110	Yes
67097	Road	-	2112	No
67098	-	Vi	-	Undeveloped
67099	Castle Garden u. 42.	Vi	1230 - commercial Building	No
67100	Kastélykert u. 44.	Vi	1261 - mansion	No
67101	-	Vi	-	No
67102	Road	-	2112	No
67103	Park u. 33.	Lke	1110	Yes
67104	29 Park u.	Lke	1110	Yes
67105	27 Park u.	Lke	1110	Yes
67106	25 Park u.	Lke	1110	Yes
67107	Park u. 23.	Lke	1110	Yes
67108	21 Park u.	Lke	1110	Yes
67109	Park u. 19.	Lke	1110	Yes
67110	Park u. 15.	Lke	1110	Yes
67111	-	Lke	1110	Yes
67112	Park u. 13.	Lke	1110	Yes
67113	Park u. 11.	Lke	1110	Yes
67114	Park u. 9.	Lke	1110	Yes
67115	Park u. 7.	Lke	1110	Yes
67116	Park u. 5.	Lke	1110	Yes
67117	Park u. 1.	Lke	1110	Yes
67118	Castle Garden u. 46.	Lke	1110	Yes
67119	Kastélykert u. 48.	Lke	1110	Yes
67120	Castle Garden u. 50.	Lke	1110	Yes
67121	Castle Garden u. 52.	Lke	1110	Yes

Hrsz	Address	Settlement zoning	Register of buildings	To be protected
67122	Fenyves u. 2.	Lke	1110	Yes
67123	Fenyves u. 4.	Lke	1110	Yes
67124	Fenyves u. 6.	Lke	1110	Yes
67125	Fenyves u. 8.	Lke	1110	Yes
67126	Fenyves u. 10.	Lke	1110	Yes
67127	Fenyves u. 12.	Lke	1110	Yes
67128	Fenyves u. 14.	Lke	1110	Yes
67129	Fenyves u. 16.	Lke	1110	Yes
67130	Fenyves u. 18.	Lke	1110	Yes
67131	Fenyves u. 20.	Lke	-	Undeveloped
67132	Fenyves u. 22.	Lke	1110	Yes
67133	Fenyves u. 24.	Lke	1110	Yes
67134	Fenyves u. 26.	Lke	1110	Yes
67135	Fenyves u. 28.	Lke	1110	Yes
67136	Fenyves u. 30.	Lke	1110	Yes
67137	Road	-	2112	No
67138	Fenyves u. 31.	Lke	1110	Yes
67139	Fenyves u. 29.	Lke	1110	Yes
67140	Fenyves u. 27.	Lke	1110	Yes
67141	Fenyves u. 25.	Lke	1110	Yes
67142	Fenyves u. 23.	Lke	1110	Yes
67143	Fenyves u. 21.	Lke	1110	Yes
67144	Fenyves u. 19.	Lke	1110	Yes
67145	Fenyves u. 17.	Lke	1110	Yes
67146	Fenyves u. 15.	Lke	1110	Yes
67147	Fenyves u. 13.	Lke	1110	Yes
67148	Fenyves u. 11.	Lke	1110	Yes
67149	Fenyves u. 9.	Lke	1110	Yes
67150	Fenyves u. 7.	Lke	1110	Yes
67151	Fenyves u. 5.	Lke	1110	Yes
67152	Fenyves u. 3.	Lke	1110	Yes
67153	Fenyves u. 1.	Lke	1110	Yes
67154	Kastélykert u. 54.	Lke	1110	Yes
67155	Castle Garden u. 56.	Lke	1110	Yes
67156/3	Private road	Lf	2112	No
67156/4	Castle Garden u. 58/A	Lf	1110	Yes
67156/5	Kastélykert u. 58.	Lf	1110	Yes
67156/6	Kastélykert u. 60.	Lf	1110	Yes

Hrsz	Address	Settlement zoning	Register of buildings	To be protected
67156/7	Castle Garden u. 62.	Lf	1110	Yes
67156/8	Kastélykert u. 64.	Lf	1110	Yes
67156/9	Castle Garden 66.	Lf	1110	Yes
67156/10	Castle Garden 68.	Lf	1271	No
67156/12	Road	-	2112	No
67156/13	Road	-	2112	No
67156/14	Road	-	2112	No
67156/15	Castle Garden u. 70.	Lf	1271	No
67156/16	Castle Garden u. 70.	Lf	-	Undeveloped
67157	Castle Garden u. 55.	Lf	1110	Yes
67158	Castle Garden u. 53.	Lf	1110	Yes
67159/1	Castle Garden 51.	Lf	1110	Yes
67159/2	Kastélykert u. 49.	Lf	1110	Yes
67160	Castle Garden u. 47.	Lf	1110	Yes
67161	Kastélykert u. 45.	Lf	1110	Yes
67162	Kastélykert u. 43.	Lf	1110	Yes
67163/1	Castle Garden u. 41.	Lf	1110	Yes
67163/2	Castle Garden u. 41/B	Lf	1110	Yes
67164	Road	-	2112	No
67165	Kastélykert u. 39.	Lke	1261 - community centre	No
67166	Summás u. 24.	Lf	1110	Yes
67167	Summás u. 22.	Lf	1110	Yes
67168	Summás u. 20.	Lf	1110	Yes
67169	Castle Garden u. 37.	Lke	1252 - crop storage	No
67170	Kastélykert u. 35.	Lke	1110	Yes
67171	Kastélykert u. 33.	Lke	1110	Yes
67172	Summás u. 18.	Lf	1110	Yes
67173	Summás u. 16.	Lf	1110	Yes
67174	Summás u. 14.	Lf	1110	Yes
67175	Kastélykert u. 31.	Lke	1110	Yes
67176	Kastélykert u. 29.	Lke	1230 - commercial Building	No
67177	Summás u. 12.	Lf	1110	Yes
67178	Summás u. 10.	Lf	1110	Yes
67179/1	Kastélykert u. 27.	Lke	1110	Yes

Hrsz	Address	Settlement zoning	Register of buildings	To be protected
67179/2	Kastélykert u. 25/B	Lke	1110	Yes
67180	Summás u. 8.	Lf	1110	Yes
67181	Summás u. 6.	Lf	1110	Yes
67182	Kastélykert u. 25.	Lke	1110	Yes
67183	Kastélykert u. 23.	Lke	1110	Yes
67184	Summás u. 4.	Lf	1110	Yes
67185	Summás u. 2.	Lf	1110	Yes
67186	Kastélykert u. 21.	Lke	1110	Yes
67187	Kastélykert u. 19.	Lke	1110	Yes
67188/1	Kastélykert u. 17.	Lke	1110	Yes
67188/2	Mátai u. 2/B	Lke	1110	Yes
67189	Mátai u. 4.	Lf	1110	Yes
67190	Mátai u. 6.	Lf	1110	Yes
67191	Mátai u. 8.	Lf	1110	Yes
67192	Mátai u. 10.	Lf	1110	Yes
67193/1	Mátai u. 12.	Lf	1110	Yes
67193/2	Summás u. 3.	Lf	1110	Yes
67194	Mátai u. 14.	Lf	1110	Yes
67195	Mátai u. 16.	Lf	1110	Yes
67196	Mátai u. 18.	Lf	1110	Yes
67197	Mátai u. 20.	Lf	1110	Yes
67198	Mátai u. 22.	Lf	1110	Yes
67199	Mátai u. 24.	Lf	1110	Yes
67200	Mátai u. 26.	Lf	1110	Yes
67201	Mátai u. 28.	Lf	1110	Yes
67202	Mátai u. 30.	Lf	1110	Yes
67203	Mátai u. 32.	Lf	1110	Yes
67204	Mátai u. 34.	Lf	1110	Yes
67205	Road	-	2112	No
67206/1	Mátai u. 33.	Lf	1110	Yes
67206/2	Nagyhát u. 5.	Lf	1110	Yes
67207	Mátai u. 31.	Lf	1110	Yes
67208	Mátai u. 29.	Lf	1110	Yes
67209	Mátai u. 27.	Lf	1110	Yes
67210	Mátai u. 25.	Lf	1110	Yes
67211	Mátai u. 23.	Lf	1110	Yes
67212	Mátai u. 21.	Lf	1110	Yes
67213	Mátai u. 19.	Lf	1110	Yes

Hrsz	Address	Settlement zoning	Register of buildings	To be protected
67214	Mátai u. 17.	Lf	1110	Yes
67215	Mátai u. 15.	Lf	1110	Yes
67216	Mátai u. 13.	Lf	1110	Yes
67217	Mátai u. 11.	Lf	1110	Yes
67218	Mátai u. 9.	Lf	1110	Yes
67219	Mátai u. 7.	Lf	1110	Yes
67220	Mátai u. 5.	Lf	1110	Yes
67221	Mátai u. 3.	Lf	1110	Yes
67222	Kastélykert u. 15.	Lf	1110	Yes
67223	Kastélykert u. 13.	Lf	1110	Yes
67224	Castle Garden u. 11.	Lf	1274	No
67225	Kastélykert u. 9.	Lf	1110	Yes
67226/1	Kastélykert u. 7.	Lf	1110	Yes
67226/2	Tobacco Street 2.	Lf	1110	Yes
67227	Tobacco Street 4.	Lf	1110	Yes
67228	Tobacco Street 6.	Lf	1110	Yes
67229	Tobacco Street 8.	Lf	1110	Yes
67230	Tobacco Street 10.	Lf	1110	Yes
67231	Tobacco Street 12.	Lf	1110	Yes
67232	Tobacco Street 14.	Lf	1110	Yes
67233	Tobacco Street 16.	Lf	1110	Yes
67234	Tobacco Street 18.	Lf	1110	Yes
67235	Tobacco Street 20.	Lf	1110	Yes
67236	Tobacco Street 22.	Lf	1110	Yes
67237	Tobacco Street 24.	Lf	1110	Yes
67238	Tobacco Street 26.	Lf	1110	Yes
67239	Tobacco Street 28.	Lf	1110	Yes
67240	Tobacco Street 30.	Lf	1110	Yes
67241	Tobacco Street 32.	Lf	1110	Yes
67242	Tobacco Street 34.	Lf	1110	Yes
67243	Road	-	2112	No
67244/1	Tobacco Street 29.	Lf	1110	Yes
67244/2	Nagyhát u. 11.	Lf	1110	Yes
67245	Tobacco Street 27.	Lf	1110	Yes
67246	Tobacco Street 25.	Lf	1110	Yes
67247	Tobacco Street 23.	Lf	1110	Yes
67248	Tobacco Street 21.	Lf	1110	Yes
67249	Tobacco Street 19.	Lf	1110	Yes

Hrsz	Address	Settlement zoning	Register of buildings	To be protected
67250	Tobacco Street 17.	Lf	1110	Yes
67251	Tobacco Street 15.	Lf	1110	Yes
67252/1	Tobacco Street 13.	Lf	1110	Yes
67252/2	Tobacco Street 13.	Lf	-	Undeveloped
67253	Tobacco Street 11.	Lf	1110	Yes
67254	Road	-	2112	No
67255	Tobacco Street 9.	Lf	1110	Yes
67256	Tobacco Street 7.	Lf	1110	Yes
67257	Tobacco Street 5.	Lf	-	Undeveloped
67258	Tobacco Street 3.	Lf	1110	Yes
67259/1	Kastélykert u. 5.	Lf	1110	Yes
67259/2	Tobacco Street 1.	Lf	1110	Yes
67260	Kastélykert u. 3.	Lf	1110	Yes
67261/1	Kastélykert u. 1/F	Lf	1110	Yes
67261/4	Castle Garden u. 1/C	Lf	1110	Yes
67261/5	Sight u. 2.	Lf	1110	Yes
67261/6	Kastélykert u. 1/E	Lf	-	Undeveloped
67261/7	Kastélykert u. 1/D	Lf	1110	Yes
67262	Sight u. 4.	Lf	1110	Yes
67263	Sight u. 6.	Lf	1110	Yes
67264	Sight u. 8.	Lf	1110	Yes
67265	Sight u. 10.	Lf	1110	Yes
67266	Sight u. 12.	Lf	1110	Yes
67267	Sight u. 14.	Lf	1110	Yes
67268	Sight u. 16.	Lf	1110	Yes
67269	Sight u. 18.	Lf	1110	Yes
67270	Sight u. 20.	Lf	1110	Yes
67271	Sight u. 22.	Lf	1110	Yes
67272	Sight u. 24.	Lf	1110	Yes
67273	Sight u. 26.	Lf	1110	Yes
67274	Sight u. 28.	Lf	1110	Yes
67275	Sight u. 30.	Lf	1110	Yes
67276/1	Sight u. 32.	Lf	1110	Yes
67276/2	Nagyhát u. 13/A	Lf	1110	Yes
67277	Road	-	2112	No
67278/1	Undeveloped	-	-	Undeveloped
67278/2	Undeveloped	-	-	Undeveloped
67279/2	Sight u. 3.	Lf	1110	Yes

Hrsz	Address	Settlement zoning	Register of buildings	To be protected
67279/3	Sight u. 3.	Lf	1110	Yes
67279/4	Sight u. 1/A	Lf	1110	Yes
67279/5	Sight u. 1.	Lf	1110	Yes
67279/6	Sight u. 3.	Lf	1110	Yes
67280	Sight u. 3.	Lf	1110	Yes
67281	Sight u. 5.	Lf	1110	Yes
67282	Sight u. 7.	Lf	1110	Yes
67283	Sight u. 9.	Lf	1110	Yes
67284	Sight u. 11.	Lf	1110	Yes
67285	Sight u. 13.	Lf	1110	Yes
67286	Sights 15.	Lf	1110	Yes
67287	Sights 17.	Lf	1110	Yes
67288	Sight u. 19.	Lf	1110	Yes
67289	Sight u. 21.	Lf	1110	Yes
67290	Sight u. 23.	Lf	1110	Yes
67291	Sight u. 25.	Lf	1110	Yes
67292	Road	-	2112	No
67293	38 Nagyhát u.	Lf	1110	Yes
67294	Nagyhát u. 36.	Lf	1110	Yes
67295	Nagyhát u. 34.	Lf	1110	Yes
67296	Nagyhát u. 32.	Lf	1110	Yes
67297	Nagyhát u. 30.	Lf	1110	Yes
67298/1	Nagyhát u. 28.	Lf	1110	Yes
67298/2	-	Lf	-	Undeveloped
67299	Nagyhát u. 26.	Lf	1110	Yes
67300	Road	-	2112	No
67301/1	Nagyhát u. 24.	Lf	1110	Yes
67301/2	Nagyhát u. 24/B	Lf	1110	Yes
67302	Nagyhát u. 22.	Lf	1110	Yes
67303	Nagyhát u. 20.	Lf	1110	Yes
67304	Nagyhát u. 18.	Lf	1110	Yes
67305	Nagyhát u. 16.	Lf	1110	Yes
67306	Nagyhát u. 14.	Lf	1110	Yes
67307	Nagyhát u. 12.	Lf	1110	Yes
67308	Road	-	2112	No
67309	Nagyhát u. 10.	Lf	1110	Yes
67310	Nagyhát u. 8.	Lf	1110	Yes
67311	Nagyhát u. 6.	Lf	1110	Yes

Hrsz	Address	Settlement zoning	Register of buildings	To be protected
67312	Nagyhát u. 4.	Lf	1110	Yes
67313	Nagyhát u. 2.	Lf	1110	Yes
0288/38	-	By	1110	Yes
0263/3	-	By	1110	Yes
0263/4	-	By	1110	Yes
0263/6	-	By	1110	Yes
0263/8	Peter's Day 5.	By	1110	Yes
0263/10	-	By	1110	Yes
0237/258	Ágnes farm 1.	By	1110	Yes
0290/1	-	Z-Kp Lk	2412	Undeveloped
0290/6	-	Z-Kp Lk	2412	Undeveloped
0290/8	-	Z-Kp Lk	2412	Undeveloped
0290/10	-	Z-Kp Lk	2412	Undeveloped
0292/1	-	Lk	1271	Yes
0292/2	-	Lk	-	Undeveloped
0294/1	-	Lk	1271	Yes
0294/3	-	Lk	-	Undeveloped
0294/4	-	Lk	1271	Yes
0294/6	-	Lk	-	Undeveloped
0294/10	-	Lk	1271	Yes
0294/11	-	Lk	-	Undeveloped
0294/12	-	By Lk	-	Undeveloped
0294/14	-	Lk	1271	Yes
0294/15	-	Lk	-	Undeveloped
0294/16	-	Lk	-	Undeveloped
0294/17	-	Lk	1271	Yes
0294/18	-	Lk	1271	Yes

Based on the data provided, there are no sites with a protected function in the industrial facilities located in the vicinity of the planning area. The parcel numbers of the impact area that do not have a protected function are attached in Annex 1.22.

For the period of operation, the land registry numbers of the properties in the area of influence have been obtained. Detailed site plans showing the noise footprint of the operation are attached as Annex 2.12. The properties to be protected during the operation are as follows.

137. Table 1: Properties to be protected during operation

Hrsz	Address	Settlement zoning	Register of buildings	To be protected
0288/38	-	By	1110	Yes
0237/258	Ágnes farm 1.	By	1110	Yes
0290/1	-	Z-Kp Lk	-	Undeveloped
0290/6	-	Z-Kp Lk	-	Undeveloped
0290/8	-	Z-Kp Lk	-	Undeveloped
0292/1	-	Lk	1271	Yes
0292/2	-	Lk	-	Undeveloped
0294/12	-	By Lk	-	Undeveloped
0294/16	-	Lk	-	Undeveloped

Although the agricultural areas of Debrecen, 0288/38, 0237/258, which are not to be protected, are affected by the area of influence delimitable to the environment not to be protected, it does not reach the part of the agricultural area not to be protected where the buildings to be protected are located.

The following parcels are added to the list of parcels of land in the open countryside affected by the operation and not to be protected:

0291; 0293; 0294/5; 0295/18; 0295/19; 0295/20; 0295/21; 0295/22; 0295/23; 0295/24; 0295/25; 0295/26; 0295/40.

The application for noise emission limit values is attached in Annex 1.29. The certificate for the remittance of the procedural fee for the application for the noise emission limit value is attached in Annex 1.30.

The parcel numbers affected by the area of influence, which do not have a function to be protected, are attached in Annex 1.22.

Despite the fact that the legislation does not noise protection limits for these areas, the Licensee undertakes to comply with the noise protection limits for the residential buildings to be protected located in agricultural areas, as set out in the table in Annex 1, point 1 of Joint Decree 27/2008 (XII. 3.) of the Ministry of Agriculture, Forestry, Environment and Water Management, which applies to areas classified as "Residential (small urban, suburban, rural, built-up areas), special areas, educational facilities, cemeteries, green areas". The values set here are 50 dB the day and 40 dB at night.

7.10. Estimating the direct economic and social consequences of changes in the state of the environment

The planned plant and its surroundings were previously used for agricultural purposes, and its designation as a development area was made by Government Decree 58/2018 (26.III.). In the area surrounding the site, infrastructure improvements have been carried out in the recent period in connection with the development of the Industrial Park, and earthworks and piling are underway in the planning area, based on the permits described in Chapter 0. The original natural and anthropomorphic environment has been destroyed during the foundation works and farming there has ceased.

The loss of the natural environment cannot be assessed in itself and has no direct economic or social consequences. The economic and social consequences of the cessation of farming on former agricultural land are no longer relevant in the context of the present procedure, since the economic area has already been designated. The volume of crops not produced in these areas is negligible in relation to the national agricultural volume and their loss no direct impact; at national level, this volume can be compensated.

The changes in the state of the environment are expected to be of an acceptable magnitude for the environmental elements under consideration, assuming technical discipline is adhered to, taking into account the calculations and assessments carried out on the basis of the data provided by the Licensee and the Designer.

7.11. Description of the measures to be taken in the event of an emergency and for operational safety

In accordance with Annex 8, point B of Government Decree 314/2005 (XII. 25.), it is not necessary to draw up a chapter. An application for a disaster management permit is planned for the facility in accordance with the provisions of the relevant Government Decree 219/2011 (X. 20.).

The potential negative environmental impacts of the proposed technology to be installed are due to the potential release of the materials to be used into the environment, and the following measures have been identified during the design phase to avoid these impacts:

- Material handling and storage in original (where applicable, ADR compliant) packaging is planned until use.
- The use of the materials is planned in closed systems or in rooms with adequate extraction and separation. The designed separation efficiency to be applied is above 90% for solid materials.
- A multi-stage, high treatment efficiency industrial wastewater treatment plant is planned for the facility.
- Stormwater collection is planned in a closed system, and there is no on-site stormwater runoff.
- The risk areas are equipped with appropriate sensors that notify the fire-fighting system and the central systems that control the equipment of any problem, allowing timely intervention
- In all cases, redundant disconnection systems are installed for point sources connected to the technology. The dust separation equipment will be equipped with a differential pressure sensor connected to the BMS system. In case of failure, the equipment associated with the point source will be shut down.

- In areas where hazardous substances are stored, the layering arrangements described in the relevant chapters will be applied. The general principle applied at the site is to prevent the escape of contaminants by a minimum of double protection.
- The NMP and electrolyte tank farms are located in a building for extra protection.
- The establishment and operation of a facility fire brigade on the site is planned.

Section 4.14.2 of the documentation contains a more detailed description of the planned protection and mitigation measures and the calculations carried out as part of the application for a disaster management permit. A detailed description of the calculations is provided in Annex 1.24. The safety report is attached in Annex 1.27 of the documentation.

7.12. Environmental protection measures

7.12.1. Identification of measures to prevent, reduce, compensate or avoid potential exposure, pollution and damage

The storage of environmentally hazardous substances in the facility is planned to be carried out inside the building, in rooms with appropriate technical protection, in containers or tanks that meet the technological requirements and the characteristics of the substance. For the storage of waste to prevent pollution, it is planned to establish workplace collection points or on-site collection points in accordance with the relevant legal requirements. Process discharges and emissions will be treated, where appropriate, by means of equipment with a high removal efficiency, thus ensuring emissions below the limit values. The installation of a multi-stage treatment plant for the pre-treatment of the effluent from the process is planned. The storm water drainage system will be equipped with an oil and sludge trap and collected in a closed system.

Greywater intended for use in cooling towers undergoes secondary treatment on site. The maximum expected pollutant emissions from the cooling towers will therefore not exceed 0.24% of the limit value, due to this and to the adequate efficiency of the droplet separation.

In the light of the above, the installation will not cause any damage to the environment or cause any pollution in excess of the limit values, provided that the necessary technical discipline is respected. No additional measures beyond the technical solutions already planned need to be defined in this respect.

7.12.2. How to measure and analyse the environmental impacts of the activity during its implementation

The obligation to measure the air quality point sources that are planned to be installed shall be
is described in chapter 7.1.3.3.

After occupation, a standardised noise monitoring measurement is carried out annually in front of the nearest protected areas, buildings and premises and at the nearest boundary of the site of the establishment to protected areas, buildings and premises.

The basic parameters of the effluents discharged from the technology will be tested as part of the automated wastewater treatment system before discharge. In addition, it is proposed to carry out monitoring measurements at given intervals in relation to a wider scope of testing, is proposed to be defined taking into account the principle of the receiving statement issued by Debrecen Waterworks Ltd. It should be stressed that the facility is a municipal and a connection point for receiving pre-treated process wastewater. The limits of the sewer receiving the urban waste water are different according to the receiving statement.

Stormwater is collected in a closed system and discharged at three points. Prior to discharge, the concentrations of the following potential pollutants are regularly monitored in consultation with the competent authority:

- copper, nickel, cobalt, aluminium, manganese, lithium
- total aliphatic hydrocarbons (TPH)
- N-methyl-2-pyrrolidone (NMP), dimethyl carbonate (DMC), ethylene carbonate (EC), ethyl methyl carbonate (EMC), glycol

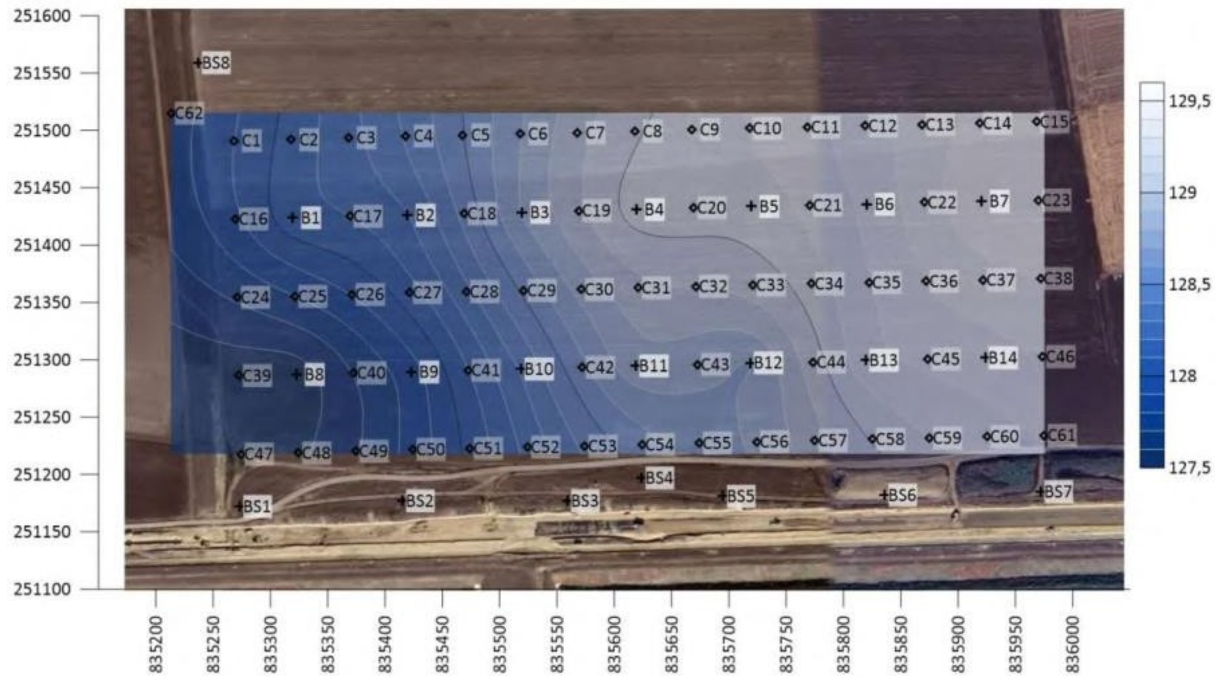
Instead of measuring volatile organic pollutants, we recommend measuring TOC to speed up the analysis. If further testing is required based on the TOC results (including TPH), this can be carried out using the samples purchased and archived in parallel, but in this case it can be assumed that the stormwater is contaminated and the necessary interventions can be initiated.

The following buildings and areas are provided with HDPE insulation, leakage and control layers:

- DW building
- BD building
- BS building battery dismantling room group
- NT building and landfill area
- ET building and drop-off area
- Part of the PS building affected by a waste water treatment plant
- EL building NMP and waste NMP transfer rooms
- AS building electrolyte transfer room.

A sensor is planned to be installed in the sampling bund, so that the leachate layer will only need to be checked when the sensors are triggered or on an annual basis.

In addition to the above, we recommend the installation of a groundwater monitoring system. A groundwater level map based on the soil mechanics excavations carried out by FUGRO Consult Ltd. in July 2023 is presented in the figure below (Source: Soil investigation report, version r1, Eve Power Hungary Kft. battery factory Debrecen, Hungary. Fugro project number: FCH-23159)



46. Figure 1: Groundwater level map of the planning area (Source: FUGRO Consult Ltd.)

As shown in the figure above, the groundwater flow direction in the area is NE-SW. Given that the groundwater monitoring system is intended to provide information on the contamination status of groundwater entering and leaving the planning area, it is proposed to locate the monitoring wells as follows:

1. Eastern boundary of the planning area (around the EM porta building)
2. The environment of the NMP tank farm (NT building environment)
3. The electrolyte tank farm environment (ET building environment)
4. The environment of the hazardous waste storage facility (DW building)
5. The environment of the wastewater treatment plant (PS building)
6. Western boundary of the site (FO building perimeter)
7. Southern boundary of the planning area (around the LO porta building)
8. Northern boundary of the planning area (along the northern boundary)

Our detailed monitoring assessment proposal for soil and groundwater at the above test points, both construction operation, is described in Chapter 12.2 of the documentation.

7.12.3. How to carry out ex-post controls after the cessation of activities

During operation, groundwater and geological media should be tested as part of the reviews at least every 5 and 10 years respectively, taking into account the relevant legal requirements. It is recommended that these inspections be carried out in the vicinity of the risky technological elements, which will allow the effects of any contamination that is not visually detectable to be identified during the period of operation. If contamination is found during a possible future clean-up, a follow-up inspection should be provided for by the competent authority as part of the contamination procedure.

8. BAT analysis

8.1. General BAT analysis

The following activity is subject to obtaining a single environmental permit pursuant to point 12 of Annex 2 of Government Decree 314/2005 (XII. 25.) harmonised with the EC Directive:

- 12. mechanical engineering, metalworking: surface treatment of materials, objects or products with organic solvents, in particular for surface preparation, printing, coating, degreasing, waterproofing, polishing, painting, cleaning or impregnating, with a solvent consumption capacity exceeding 150 kg/hour or 200 tonnes/year.

138. Table 1: BAT recommendation taken into account

Procedures	BATC	Status of
Industry-specific	A COMMISSION (EU) 2020/2009 IMPLEMENTATION DECISION on the conclusions on best available techniques (BAT) under Directive 2010/75/EU of the European Parliament and of the Council on industrial emissions with regard to surface treatment with organic solvents, including preservation of wood and wood products with chemicals	Retrieved from

In view of the considerations set out in Section 7.1.3.1, the planned installation of boilers in the facility is not planned to be connected to a common chimney and is not technically feasible while maintaining operational safety. The BAT conclusions set out in the relevant COMMISSION (EU) 2017/1442 EXECUTIVE DECISION apply to the following activities, as set out in Annex I to Directive 2010/75/EU, which are relevant in this case:

- 1.1 The combustion of fuels in installations with a total rated thermal input of 50 $_{MWth}$ or more, only where this activity takes place in combustion plants with a total rated thermal input of 50 $_{MWth}$ or more.

Given that the rated thermal input of the boilers is less than 50 MWth per installation and that it is not technically feasible to connect the boilers to a single stack, and therefore the co-calculation rule does not apply, COMMISSION DECISION (EU) 2017/1442/EC does not apply to the boilers planned to be installed in the installation.

General BAT Reference Documents considered:

139. Table 1: BAT reference documents considered

Procedures	BATREF	Status of
General	Reference document on the application of best available techniques in industrial refrigeration systems	Retrieved from
Procedures	**BATREF**	**Status of**
General	Summary Reference Document on best available techniques for storage emissions	Retrieved from

For the determination of the BAT, the general criteria for the determination of the best available techniques are set out in Annex 9 to Government Decree 314/2005 XII. .)
17 (4) is not necessary, as the production process used in the establishment is in accordance with the above
is covered by the BAT mentioned above.

8.2. Surface treatment of materials, articles or products with organic solvents

The BAT conclusions for surface treatment technology in the EL building, as defined in the BAT conclusions under Directive 2010/75/EU of the European Parliament and of the Council on industrial emissions Directive 2010/75/EU of the European Parliament and of the Council on the determination of conclusions on best available techniques (BAT) for surface treatment with organic solvents, including preservation of wood and wood products with chemicals, are assessed as follows.

140. Table 1: BAT compliance of the coating sub-technology

BAT identifier	BAT recommendation	Applied technology	Evaluation
BAT 1.	**The BAT to be applied to improve overall environmental performance is to implement an environmental management system (EMS) and application, covering all the following aspects:**		
	i. and leadership, leadership, including top management management - accountability effective EMS implementation;	• In order to improve overall environmental performance, management will develop and implement an environmental management system (EMS) that includes: • the commitment, guidance and accountability of management, senior management, for the effective implementation of KIR. • analysis, which includes defining the environment of the organisation, identifying the needs and expectations of stakeholders, identifying the characteristics of the installation that pose a potential risk to the environment (or human health), and the legal requirements for the environment. • developing an environmental policy that includes continuous improvement of the environmental performance of the installation. • setting targets and performance indicators for significant environmental aspects, including ensuring compliance with applicable legal requirements. • design and implementation of procedures and measures (including, where appropriate, corrective and preventive measures) necessary to achieve environmental objectives and avoid environmental risks. • define structures, roles and responsibilities for environmental aspects and objectives, and provide the necessary financial and human resources. • developing the necessary skills and awareness of staff whose work may have an impact on the environmental performance of the installation (e.g. through information and training); • internal and external communication; • effective operational planning and process management. • implementing appropriate maintenance programmes.	Retrieved from
	an analysis to define the context of the organisation, assess the needs and expectations of stakeholders, identify the characteristics that influence the potential environmental (or human health) risk of the installation, and identify applicable legal requirements relating to the environment;		
	iii. the development of an environmental policy that takes into account the includes continuous improvement of its environmental performance;		
	iv. setting targets and performance indicators for significant environmental factors , including the applicable legal ensure compliance with the requirements;		
	design and implementation of procedures and measures to achieve environmental objectives and avoid environmental risks (corrective and preventive action where necessary);		
	planning and implementing the procedures and actions necessary to achieve environmental objectives and avoid environmental risks (including, where appropriate, corrective and preventive measures) is);		
	the definition of structures, roles and responsibilities in relation to environmental aspects and objectives, and the necessary financial and human resources;		
	viii. internal and external communication;		
	ix. for workers good environmental management practices promoting participation;		
	the management manual and written procedures and records for the control of activities with significant environmental impact setting up and managing;		
	xi. effective operational planning and process control;		
	xii. implement appropriate maintenance programmes;		

BAT identifier	BAT recommendation	Applied technology	Evaluation
	xiii. emergency preparedness and response plans, including the prevention of and/or (environmental) (environmental) impacts of emergencies mitigating the impact of;	• emergency preparedness and response protocols, including prevention and/or mitigation of adverse (environmental) impacts of emergencies. • implementing a monitoring and measurement programme. • assessing the causes of non-compliances, implementing corrective actions in response to non-compliances, reviewing the effectiveness of corrective actions, and determining whether similar non-compliances exist or may occur. • periodic senior management review of the KIR and its ongoing suitability, adequacy and effectiveness;	
	(re)design of a (new) installation or part of an installation to take into account the environmental impacts expected throughout its lifetime, including construction, maintenance, operation and decommissioning;		
	xv. implementation of a monitoring and measurement programme; in this context, the Commission has adopted a proposal for a Directive on the monitoring of emissions into air and water from installations subject to the industrial emissions directive information contained in the reference report;	Monitoring and measurement of activities on the site will be carried out in accordance with the requirements to be specified in the IPPC permit. Based on the specifications, the company will prepare a measurement programme carry out the measurements on time.	Retrieved from
	xvi. systematic use of sectoral benchmarking;	Sectoral comparative documents are not available due to the confidential nature of the technologies. Information flows between the different sites are open and technology is constantly improving compared to previous factories. Good practices and results of continuous improvement are shared with between sites.	Retrieved from
	periodic independent internal audits (if feasible) or periodic independent external audits to assess environmental performance and to determine whether the EMS is meeting its intended measures and whether they have been properly implemented and maintained;	It is planned to carry out regular external and internal audits in accordance with the requirements of ISO14001. The audits will demonstrate that the environmental management system is operating in accordance with the standard.	Retrieved from
	assessing the causes of non-compliances, implementing the corrective actions taken, examining the effectiveness of the corrective actions and determining whether similar non-compliances exist or may occur non-conformities;	During operations, non-compliances are identified, internal and external audits are planned to be recorded in accordance with the requirements of the standard and legislation, and an action plan is drawn up for these to solve.	Retrieved from
	periodic senior management review of the EMS and its continuing suitability, adequacy and effectiveness	The effectiveness of the company's environmental management system through management reviews and external and internal audits are checked.	Retrieved from
	xx. the cleaner technologies development track monitoring of the development of cleaner technologies and taking into account.	During the design phase, efforts are made to install BAT-compliant technologies. These technologies will also be evaluated during the operational phase and, where possible, will be based on the available improved with technical solutions	Retrieved from
	BAT specifically applicable to surface treatment with organic solvents is the incorporation of the following elements into the EMS:		
	i) Link to quality control and assurance, health and safety considerations.	company's environmental department works closely with quality management and a workplace health protection and safety department and the authorities.	Retrieved from

	Designing to reduce the environmental footprint of the installation. This means in particular: (a) an assessment of the overall environmental performance of the installation (see BAT 2);	In order to improve the overall environmental performance of organic solvent surface treatment, management, in coordination with quality control and quality assurance, will ensure health and safety develop and implement security considerations.	Retrieved from
BAT identifier	**BAT recommendation**	**Applied technology**	**Evaluation**
	b) taking into account the impacts between environmental elements, in particular the reduction of solvent emissions and maintaining an appropriate balance between energy consumption (see BAT 19), water consumption (see BAT 20) and raw material consumption (see BAT 6); c) reducing VOC emissions from cleaning processes (see: BAT 9).	Management is working to reduce the environmental footprint of the facility. This mainly involves: assessing the overall environmental performance of the plant, identifying environmental impacts and considerations at each step of the process, taking into account all aspects of the process, with particular attention to reducing solvent emissions and maintaining an appropriate balance between energy, water and raw material consumption; reducing emissions of volatile organic compounds (VOCs) from cleaning processes; implementing a raw material evaluation system to ensure the use of raw materials with low environmental impact and developing a plan to optimise the use of solvents in the process; preparing, monitoring and developing a solvent mass balance, energy efficiency plan, water management plan, waste management plan and odour control plan; (noting that the range of raw materials that can be used is very limited and has a significant impact on product quality, so that substitution of raw materials is only possible within the limits set by industry standards) Introduce monitoring and identify opportunities for improvement in the areas, phases and steps that contribute most to VOC emissions and can be identified in terms of energy consumption. The identification, monitoring and repair activities aim to minimise VOC emissions and energy consumption. The EMS is operated by regularly updating the database at least twice a year, defining key performance indicators (KPIs) and monitoring the implementation of measures. For manual cleaning, wipes pre-impregnated with cleaning agents are used. Where this can be done taking into account technological requirements, the use of solvent-free cleaning technology is planned (steam cleaning).	

	Incorporation of the following: a) a plan for the prevention and control of leaks and spills (see BAT 5(a)); b) a raw material evaluation system for the use of low environmental impact raw materials and a plan for optimising the use of solvents in the process (see BAT 3); c) solvent mass balance (see BAT 10); d) a maintenance programme to reduce the frequency and environmental consequences of OTNOC (see BAT 13); e) energy efficiency plan (see BAT 19(a)); f) water management plan (see BAT 20a);	The EHS department plans to develop a comprehensive documentation system. The documentation system will summarise the data collected during the activity. Once the data has been evaluated, the company will formulate measures based on industry standards, BAT requirements and the requirements to be specified in the environmental permit. The results of the assessments and the planned measures are grouped according to the themes listed in the BAT Recommendation.	Retrieved from
BAT identifier	**BAT recommendation**	**Applied technology**	**Evaluation**
	g) waste management plan (see BAT 22a); h) an anti-pollution action plan (see BAT 23).		
BAT 2.	**The BAT to be applied in order to improve the overall environmental performance of the plant, in particular improve its VOC emissions and energy consumption, are:**		
	identify the process areas/sections/steps with the highest potential for improvement that contribute most to VOC emissions and energy consumption (see also BAT 1);	The activity will be carried out in accordance with the relevant BAT regulations. The amount of solvents used for coating is minimised, with water being used as the solvent on the anode side. The NMP used on the cathode side is considered a low volatility solvent due to its chemical characteristics, which minimises evaporation during the coating application. The coating is applied using rollers. The unused volume is recycled back into the system after filtration and can be reused, thus minimising the amount of waste generated. The technology aims to minimise solvent waste. The NMP that evaporates during drying recovered from the exhaust air by	
	identifying and implementing measures to minimise VOC emissions and energy consumption;		

	Update the situation regularly (at least once a year) and follow up on the implementation of identified actions	condensation in liquid form and transferred to NMP waste tanks. The recovered NMP is not recycled on-site, it is by design such as The waste will be transferred to a third party with a waste management licence who can ensure the preparation of the waste for NMP recycling by distillation. From the initial design stage, the company has put a strong emphasis on environmental least impact on the environment, most The monitoring of VOC emissions will be supported by annual solvent balances and emission measurements at prescribed intervals. The installation will be required to install an energy management system or to carry out an energy audit in view of its consumption characteristics, and the use of an energy consultant will be mandatory for the Licensee. These commitments and voluntary commitments provide the Permittee with the opportunity to monitor VOC emissions and energy consumption and identify opportunities for improvement. As part of the ISO 14001 management system, these impacts are also monitored as KPIs and there is the possibility to assess and update, at least annually, the measures identified to monitor the implementation of.	Retrieved from
BAT 3	**BAT to prevent or reduce the environmental impact of the raw materials used is to use the following two techniques means.**		
	a) Use of raw materials with low environmental impact As part of the EMS (see BAT 1), a systematic assessment of the adverse environmental effects of the substances used (in particular carcinogenic, mutagenic and toxic for reproduction substances and substances of very high concern) and, where possible - possible substitution of these substances with , have no or less impact on the environment and health,	The company plans to implement and operate an environmental management system. The company's environmental policy aims at systematically assessing the adverse environmental impacts of the materials used and, where possible, substituting them with other materials that do not cause environmental or health impacts. The design of the installation shall take into account are planned to provide:	Retrieved from

BAT identifier	BAT recommendation	Applied technology	Evaluation
	taking into account product quality requirements or product characteristics Generally applicable. The scope (e.g. level of detail) and nature of the assessment will generally depend on the nature, size and complexity of the operation, its potential environmental impacts and the type and quantity of materials used.	- effective control - avoid unnecessary packaging. - construction of closed systems - reduce actual solvent consumption by build recycling solutions with a third party.	

	b) Optimising the use of solvents in the process. Optimising solvent use in the process through a management plan (as part of the EMS [see BAT 1]), aimed at identifying and implementing the necessary measures (e.g. colour grouping, spray optimisation). Generally applicable.	The plant will have a solvent management plan, which will included: - compliance checks. - identifying future reduction options, - providing information on solvent consumption and emissions, The performance of installations and technologies in terms of emissions, expressed as short and long-term averages where appropriate, and related reference conditions, consumption and nature of raw materials, water consumption, energy use and waste generation. In order to improve the overall environmental performance specifically related to surface treatment with organic solvents, management shall develop and implement, inter alia: - Coordination with quality control and quality assurance, health and safety considerations. - Planning to reduce the environmental footprint of the facility. This includes in particular: - assess the overall environmental performance of the plant, - identifying environmental impacts and considerations at every step of the process, - taking into account all aspects of the process, with particular attention to reducing solvent emissions and maintaining an appropriate balance between energy, water and raw material consumption. - reducing emissions of volatile organic compounds (VOCs) from cleaning processes. - implementing a raw material evaluation system to ensure the use of raw materials with low environmental impact and developing a plan to optimise the use of solvents in the process. - preparation of solvent material balance sheets, energy efficiency plans, water management plans, waste management plans and odour control plans, monitoring and monitoring and development.	Retrieved from
BAT 4	**The BAT to be applied to reduce solvent consumption, VOC emissions and the overall environmental impact of the raw materials used are using one or a combination of techniques.**		
	a) High solids solvent based use of paints/coatings/varnishes/inks/adhesives: low	The technique is not applied	Retrieved from
BAT identifier	**BAT recommendation**	**Applied technology**	**Evaluation**
	solventborne and high solids paints and coatings, use of liquid inks, varnishes and adhesives.		
	b) Use of water-based paints/coatings/inks/varnishes/adhesives The use of paints, coatings, liquid inks, varnishes and adhesives, in which the organic solvent is partially replaced by water.	On the anode side, water use is planned	

	c) Use of radiation-setting inks/coatings/paint/varnishes/adhesives. The use of paints, coatings, liquid inks, varnishes and adhesives that can be treated by UV, activation or fast electron activation of specific chemical groups, the application of heat and the use of VOC without emissions.	The technology involves the use of marking ink that solidifies under UV light mark batteries.	
	d) Use of solvent-free two-component adhesives Solvent-free, two-component, resin and starch álló use of adhesives.	The technique is not applied	
	e) Use of thermoplastic adhesivesThe use of adhesives made from hot-pressed synthetic rubbers, hydrocarbon resins and various additives application of coating. No solvents are used in this case.	The technique is not applied	
	f) Use of powder coatings Use of solvent-free coating, finely dispersed powder and fixed in heat furnaces.	The technique is not applied	
	g) Use of laminating film for coating webs or rolls of tape. The use of polymeric films applied to a roll of tape or web to provide aesthetic or functional properties, which reduces the number of coating layers required.	The technique is not applied	
	(f) the use of substances which are not volatile organic compounds or organic compounds of lower volatility. The substitution of highly volatile VOC substances by other non-VOC or lower volatile VOC substances is not allowed. organic compounds (e.g. esters).	The technique is not applied	
BAT 5	**BAT to prevent or reduce fugitive VOC emissions from the storage and handling of solvent-containing and/or hazardous substances is to apply the principles of good management using each of the following techniques.**		
	Management techniques		
	a) Prepare and implement a plan for the prevention and management of leaks and spills The plan for the prevention and management of leaks and spills is part of the EMS (see BAT 1) and includes, inter alia: — on-site incident management plans for small and large spills; — define the roles and responsibilities of the persons concerned; — the environmental awareness of staff and spills training in the prevention/treatment ; — identification of areas where there is a risk of spills and/or leaks of hazardous substances and the classification of these areas according to risk; — appropriate containment systems in the identified areas, e.g. impermeable provide floors;	The company's environmental management system, plant emergency response plan and major incident response plan will include the measures to be taken in case of damage resulting from different failure levels. To prevent damage, materials and waste are stored in such a way as to avoid contamination of soil and groundwater during normal operation. The documentation of possible damage incidents will be carried out in accordance with the provisions of Government Decree 90/2007 (IV. 26.). The prevention of damage events is carried out in accordance with the monitoring measures under BAT 13. The primary consideration in the process design was to minimise the potential for pollution associated with accidental events,	Retrieved from
BAT identifier	**BAT recommendation**	**Applied technology**	**Evaluation**

	— the identification and location of appropriate equipment for containment and clean-up of spillage, near the points where such an event may occur, and regular monitoring of its availability and operational condition; — waste management guidelines for the treatment of waste from spills; — regular (at least once a year) inspections of storage and operational areas, testing and calibration of leak detection equipment, and rapid repair of leaks in valves, seals, flanges, etc. (see BAT 13).	for which detailed information is provided in chapter 4.14.	
	Storage techniques		Retrieved from
	b) Closure or covering of containers and storage area. Storing solvents, hazardous substances, waste solvents and waste cleaning agents in closed or covered containers that are appropriate to the associated risk and suitable to minimise releases. Containers have a liquid containment area of adequate capacity.	Both the NMP and the electrolyte tank farm will be located in the same building. The smaller intermediate tanks will be installed in the EL and AS buildings. In accordance with the relevant standards, it is planned to install appropriate damage barriers under the storage tanks. A layer system with HPDE foil and a control monitoring system is planned under the storage tanks (detailed information: section 4.14.1.1). Leak detection sensors and solvent vapour sensors will be installed and connected to the BMS system to prevent leaks and spills and to allow automatic intervention. Liquid waste is stored in closed containers with appropriate technical protection in areas designated for this purpose. The ventilation of the storage tank farms and the hazardous waste storage area (both normal and emergency) is connected to an air pollution control point source after appropriate isolation to ensure controlled emissions. Contaminated air discharged through storage tank ventilation lines is also separated after is air pollution control point source to be issued.	
	c) Minimise the storage of hazardous substances in production areas. Hazardous substances are present in production areas only in quantities necessary for production; larger quantities are stored separately	Hazardous substances are present in the production areas only in the quantities necessary for production; larger quantities are stored separately and selectively in the hazardous substances storage building. The building is technically sound, with almost no emissions is protected.	
	Techniques for pumping and handling liquids		
	d) Techniques to prevent leaks and spills during pumping. Leaks and spills are prevented by the use of pumps and seals that are suitable for the material being treated and that seal properly. This includes equipment such as closed-system motor pumps, solenoid-operated pumps, with multiple mechanical seals and with extinguishing or pumps with buffer system, with multiple mechanical seals	The piping system is and constructed in accordance with national and European legislation, with welded joints preferred for increased safety, and where flange joints are unavoidable, increased reliability gaskets are used. In the case of joints that are to be frequently undone, the fitting of a leakage protection sleeve is required.	Retrieved from
BAT identifier	**BAT recommendation**	**Applied technology**	**Evaluation**

BAT identifier	BAT recommendation	Applied technology	Evaluation
	and pumps with a dry seal to the atmosphere, diaphragm pumps or peristaltic pumps.	After installation, a statutory strength pressure test is planned and repeated regularly in accordance with official regulations. The entire piping system is closed, the pumps used are closed system (solenoid-coupled diaphragm pumps multiple mechanical with gasket)	
	e) Techniques to prevent overflow during pumping. This includes, for example, ensuring that: -supervise the pumping operation; -for larger quantities, bulk storage containers must be fitted with a high level acoustic and/or optical alarm system, with a barrier system if necessary.	The pumping operation is monitored, controlled by a PLC system to ensure proper operation. The redundant sensor systems (level sensor, level switch, pressure transmitter) installed in the tanks ensure that no overfilling of the tanks can occur. Liquid and solvent vapour sensors provide local acoustic and optical alarms to the control panel, PLC beyond the BMS control signal.	Retrieved from
	f) Capture of VOC vapours during solvent injection. During the bulk transport of solvent-containing substances (e.g. loading or unloading of containers), vapour escaping from the receiving containers is captured, usually by vapour recovery	During the offloading process, the transfer tank and the ISO tanker are connected by a gas shuttle to prevent NMP contamination from escaping into the environment. In all cases, unloading must be carried out in the presence of a person who has passed an ADR test. Contaminated air discharged through storage tank ventilation lines is also separated after is air pollution control point source to be issued.	Retrieved from
	(g) Containment and/or rapid spill containment during handling of solvent-containing substances: When handling solvent-containing substances in tanks, any spillage shall be contained, e.g. by the use of trolleys, pallets and/or ladles with built-in containment (e.g. "drip trays") and/or rapid absorption with absorbent materials	1. Hazardous liquid substances stored in large quantities should be disposed of in a salvage yard. In accordance with the relevant standards, it is planned to provide adequate containment below the storage tanks. A layer system with HPDE foil and a control monitoring system is planned under the storage tanks. Leak detection sensors and solvent vapour detectors will be installed and connected to the BMS system to prevent leaks and spills and to allow automatic intervention. 2. The tanks to be placed next to the production lines will be of double-walled design with a leak detection system or will be placed in a steel damage container of adequate capacity. 3. The NMP transport pipeline is made of stainless steel. The entire piping system is closed, the pumps used are closed system (magnetic drive diaphragm pumps with multiple mechanical seals). The piping system is designed and constructed in accordance with national and European legislation, welded joints are preferred for increased safety, where flange joints are unavoidable, increased reliability seals are used. In the case of joints that are to be frequently undone, the fitting of a leakage protection sleeve is required. 4. In addition to the above, any spill is risky in the area, a rescue kit will be provided to protect the small quantities of	Retrieved from

		immediate containment and rapid absorption of the pollutant that escapes. The areas affected by passive storage are equipped with rivers and seals.	
BAT 6.	**BAT to reduce raw material consumption and VOC emissions is to use one or a combination of the following techniques**		
	a) Centralisation of the application of VOC-containing substances (e.g. inks, coatings, adhesives, cleaners). Delivery of VOC-containing substances (e.g. inks, coatings, adhesives, cleaning agents) to the application area via ring mains by direct piping, including system cleaning, e.g. by pipe cleaning or air flushing	For the NMP supply and NMP recovery system, NMP recovery from NMP-contaminated air by condensation is planned. The recovered NMP will be transferred to waste tanks. The recovered NMP will not be recycled on-site, but planned to be transferred to a third party with a waste management licence who can ensure the preparation of the waste for NMP distillation for recycling. Cleaning of the mixing equipment and piping will be carried out in a closed system, from which no uncontrolled emissions will occur, as the discharge of exhaust air to the environment is planned to take place after passing through a separation system at an air pollution control point source. Emissions of UV-curing marking ink pollutants are also discharged through a separation system to ensure air purity and protection point source.	Retrieved from
	b) Advanced mixing systems Computer controlled mixing equipment to produce the desired paint/coating/ink/adhesive.	For efficient mixing, a vacuum is designed into the mixing tanks to reduce energy consumption and evaporation, thus minimising material loss. The entire slurry system is PLC controlled, and only variable frequency speed variable speed mixers are used for mixing for use in.	Retrieved from
	(c) VOC-containing materials (e.g. inks, coatings, adhesives, cleaners) are transported to the place of application in a closed system. In the case of frequent changes of inks/coatings/adhesives and solvents or for small-scale use, the following should be placed near the application area small in small containers inks/inks/coatings/adhesives and solvents stored in small containers.	Pipelines carrying hazardous media are made of stainless steel. The entire piping system is closed, the pumps used are of the closed system type (magnetic coupling or diaphragm pumps with multiple mechanical seals). The piping system is designed and constructed in accordance with national and European legislation, with welded joints for increased safety, and where flange joints are unavoidable, increased reliability seals are used. In the case of joints that are to be frequently undone, the fitting of a leakage protection sleeve is required. The emission of UV-curing marking ink pollutants is also is discharged through a separation device at an air pollution control point source.	Retrieved from
	d) A colour change AutomationAutomatic colour change and flushing of the ink/ink/coating line by trapping the solvent.	Irrelevant, there are no plans to use coloured paint in the facility.	No relevant
	e) Grouping by colour Modify the product range by creating large, identical colour ranges in order.	Irrelevant, there are no plans to use coloured paint in the facility.	No relevant

BAT identifier	BAT recommendation	Applied technology	Evaluation
	f) Cleaning without rinsing Refilling the spray gun with new paint without intermediate rinsing.	Irrelevant, there are no plans to use coloured paint in the facility.	No relevant
BAT 7.	**The use of one or a combination of techniques in the application of coatings to reduce the consumption of raw materials and the overall impact on the environment.**		
	Spray-free application techniques		
	a) Loading cylinder Application method where cylinders are used to transfer or measure the liquid coating onto a moving belt For use on flat substrates only (4).	This technique is used for coating. The slurry is applied to the coating roller by a rotary movement around its own axis, from which the coating material is applied to the aluminium and copper foil a, which moves linearly over the a. The unused quantity is recycled after filtration to the into the system and reused, minimising the amount of waste generated.	Retrieved from
	b) Blade above the cylinder The coating is applied to the substrate through the gap between the blade and the cylinder. As soon as the coating and the surface pass, the excess is scraped off. Generally applicable (4).	-	No relevant
	c) No rinse (in-situ drying) application for coating of tape rolls Application of conversion coatings that do not require additional water rinsing with a coating roller or roller wiper. Generally applicable (4).	-	No relevant
	d) Curtain coating (casting) The workpieces are passed through a laminar coating layer discharged from a collection tank. For use on flat substrates only (4).	-	No relevant
	e) Electrocoating The dye particles dispersed in the water-based solution are deposited on the immersed platelets by an electric field (electrophoretic deposition. For use on metal substrates only (4).	-	No relevant
	f) Flooding The workpieces are fed on conveyor belts into a closed channel, which is flooded with the coating via injection pipes. The excess material is collected and reused Generally applicable (4).	-	No relevant
	g) Co-extrusion The printed substrate is with a warm, liquid plastic film and then cooled. This film replaces the additional coating layer required. It can be used as an adhesive between two different layers of different substrates. Not applicable if high bonding strength or sterilization temperature resistance is required (4).	-	No relevant
	Spray spraying techniques		
	h) Air-assisted, airless spraying The airflow (forming air) is controlled by the airless spray gun's spray cone used to modify.	-	No relevant

BAT identifier	BAT recommendation	Applied technology	Evaluation
	Generally applicable (4).		
	i. Pneumatic spraying with inert gases Pneumatic paint application with inert gases under pressure (e.g. nitrogen, carbon dioxide). It may not be suitable for coating wood surfaces (4).	-	No relevant
	j) High-performance low-pressure (HVLP) spraying Spraying the paint in the nozzle by mixing it with high-volume, low-pressure air (up to 1.7 bar). The paint transfer efficiency of HVLP guns is over 50 %. Generally applicable (4).	-	No relevant
	k) Electrostatic sputtering (fully automated) High-speed spraying with rotary discs and bells, and spraying jets with electrostatic fields and air-forming shaping.	-	No relevant
	(l) Electrostatically assisted air or airless sprayingPneumatic or airless atomized spray jet forming with an electrostatic field. The transfer efficiency of electrostatic paintbrushes exceeds 60 %. The transfer efficiency of fixed electrostatic methods is up to 75 %.	-	No relevant
	m) Hot spraying/spraying Pneumatic spraying with hot air or heated paint. It may not be applicable in case of frequent colour changes (4).	-	No relevant
	n) Spraying/spraying, wiping and rinsing for coating of tape rolls Nozzles are also used for applying cleaning products, pre-treatments and rinsing. After spraying, squeegee wipers are used to minimise solution spillage, followed by rinsing Generally applicable (4).	-	No relevant
	Automation of spraying		
	o) Robot application Robotic application of coatings and sealants to internal and external surfaces. Generally applicable (4).	-	No relevant
	p) Machine application Use of painting machines to handle the nozzle/spray gun/nozzle.	-	No relevant
BAT 8	**The BAT to be applied in the drying/treatment processes of coatings to reduce energy consumption and overall environmental impact is use one or a combination of the following techniques.**		
	a) Inert gas convection drying/treatment The inert gas (nitrogen) is heated in the furnace, allowing the solvent to exceed LEL levels. Solvent loads exceeding 1 200 $^{g/m3}$ nitrogen are possible. Not applicable if the dryers have to be opened regularly (5).	-	No relevant
	b) Induction drying/curing	-	No relevant

BAT identifier	BAT recommendation	Applied technology	Evaluation
	Heat treatment or drying on the production line using electromagnetic inductors, which generate heat inside the metal workpiece by means of an oscillating magnetic field For use on metal substrates only (5).		
	c) Microwave and high frequency drying Drying with microwave or high frequency radiation. Only for water-based coatings, inks and non-metallic substrates applicable (5).	-	No relevant
	d) Radiation treatment: Radiation treatment is applied to layers of resins and reactive diluents (monomers) that respond to exposure to radiation (infrared (IR), ultraviolet (UV)) or high energy electron beams (EB) Only for specific coatings and inks (5).	-	No relevant
	e) Combined convection/infrared drying Drying of wet surfaces using a combination of circulated hot air (convection) and infrared radiation. Generally applicable (5).	-	No relevant
	f) Convection drying/treatment combined with heat recovery The heat from the flue gases is recovered (see BAT 19(e)) and used to preheat the air entering the convection dryer/curing oven Generally applicable (5).	The polluted air from the furnaces containing evaporated NMP is fed into the heat recovery system with two hermetically sealed compartments to preheat the recirculated purified air.	Retrieved from
BAT 9	**The BAT to be applied to reduce VOC emissions from cleaning processes is to minimise the use of solvent-based cleaning agents and using a combination of the following techniques.**		
	a) protection of areas and equipment used for spreading Application decks and equipment exposed to spray residues, drips, etc. (e.g. spray boom walls and robots) are covered with fabric covers or disposable films if the films are not exposed to tearing or abrasion. The choice of cleaning techniques may be limited by the type of process, the type of substrate or equipment and type of contamination.	No spray coating is used. Not relevant.	No relevant
	b) Removal of solids prior to full cleaning Solids are removed in concentrated (dry) form, usually by hand, with or without the use of small amounts of cleaning solvent. This reduces the amount of material to be removed with solvent and/or water in subsequent cleaning stages, thereby reducing the amount of solvent and/or water used.	There are no small areas in the technology where manual cleaning to remove solids before solvent or water-based cleaning is feasible.	No relevant
	c) Manual cleaning with pre-impregnated wipes Wipes pre-impregnated with detergents are used for manual cleaning. The cleaning agents can be solvent-based, low volatile or solvent-free agents.	The cell surface is cleaned with a pre-impregnated alcohol wipe. Due to the size of other surfaces, cleaning with wipes is not feasible.	Retrieved from
	d) Use of low volatility detergents Use of low volatile solvents as cleaning agents for manual or automated cleaning with high cleaning power.	The use of a detergent with a lower volatility than NMP in the mixing tanks on the cathode side is not acceptable in view of the technological requirements. However, the use of low volatility NMP is considered a solvent, so the technique is applied.	Retrieved from

BAT identifier	BAT recommendation	Applied technology	Evaluation
	e) Water-based cleaning Water-based detergents or water-miscible solvents such as alcohols or glycols are used for cleaning.	The surface of the mixing tank and slurry system on the anode side is cleaned with water. The cell surface, where applicable, is steam cleaned. (Other locations used cleaning activities in above are defined in the BAT points described)	Retrieved from
	f) Closed washing equipment Automatic, batch-by-batch cleaning/degreasing of press/machine parts in closed washing facilities. This can be done using one of the following: a) organic solvents (by air extraction followed by VOC reduction and/or recovery of the solvents used) (see BAT 15); or b) VOC-free solvents; or c) alkaline detergents (with external or internal waste water treatment).	Closed washing facilities are not planned for the facility.	No relevant
	g) Cleaning by solvent recovery For cleaning the production line between guns/applicators and colour changes used solvents collecting, storage and facility reuse where possible	Not relevant, the facility does not plan to use colour painting.	No relevant
	h) Cleaning with high pressure water spray Automatic inspection of press/machine parts batch cleaning systems using high pressure water spray and sodium bicarbonate or equivalent are used	This method should not be used in battery manufacturing facilities.	No relevant
	i) Ultrasonic cleaning Cleaning in liquid with high frequency vibrations to remove stuck to loosen dirt.	Unplanned use of the technique.	No relevant
	j) Dry ice (CO2) cleaning Cleaning of machine parts and metal or plastic substrates by blasting with CO2 shavings or powder blasting.	Unplanned use of the technique.	No relevant
	k) Plastic grit cleaning Excess paint build-up is removed by blowing plastic particles from the mounting panels and body mounts.	Not relevant. Use of mounting panels and body mounts No planned.	No relevant
BAT 10	**BAT is to monitor total and fugitive VOC emissions by compiling, at least once a year, mass balance of solvents entering and leaving the installation as specified in point 2 of Part 7 of Annex VII to Directive 2010/75/EU, using each of the following techniques minimise the uncertainty of solvent mass balance data**		
	a) Full identification and quantification of relevant solvent inputs and outputs definition, including the associated uncertainty This includes: — Identification and documentation of solvent inputs and discharges (e.g. discharges with final gases, discharges from each fugitive emission source, solvent discharges with waste); — quantify all relevant solvent inputs and outputs in a robust manner and record the methodology used (e.g. measurement, calculations using factors emissions , operational estimation based on parameters);	The plant will have a solvent management plan which will include the following parts included: • compliance checks; • identifying future reduction options, • providing information on solvent consumption and solvent emissions. In order to ensure proper monitoring, a solvent balance should be established for the site, taking into account the European Commission Implementing Decision 2020/2009 BAT 1 and BAT 10. The preliminary solvent balance is described in 7.1.3.4, the detailed NMP balance sheet is attached in the Annex.	Retrieved from

BAT identifier	BAT recommendation	Applied technology	Evaluation
	— identifying the main sources of uncertainty in the above-mentioned quantification and implementing corrective measures to reduce uncertainty; — regular updating of solvent input and emission data	Flow meters are installed in the piping system. The feed tanks will be placed on a metering cell, which will allow accurate monitoring. This allows the amount of solvent used to be continuously and accurately monitored and optimised.	
	b) Implementation of a solvent tracking system The solvent tracking system aims to monitor both the quantities of solvent used and the quantities of solvent not used (e.g. by measuring the quantities used).		Retrieved from
	c) Monitoring changes that may affect the uncertainty of solvent mass balance data Any changes that may affect the uncertainty of the solvent mass balance data should be , such as: — malfunctions of the flue gas treatment system: recording the date and duration; — changes that may affect the air/gas flow rate, e.g. replacement of fans, drive rollers, motors: the change recording the date and type of		Retrieved from
BAT 11	**The BAT is to monitor emissions of waste gases in accordance with EN standards, at least with the following frequency. If not available EN standard, the applicable BAT is to use ISO, national or other international standards that are scientifically equivalent ensure the quality of data collection.**		
	Substance - Sectors/Forres - Minimum frequency of follow-up		
	Powder - EN 13284-1 - Coating of vehicles - Spray coating - Once a year (1) - BAT 18	The proposed technology is not included in the best available techniques and is therefore not relevant.	No relevant
	Powder - EN 13284-1 - Coating of other metal and plastic surfaces - by spraying coating - Once a year (1) - BAT 18		
	Dust - EN 13284-1 - Aircraft coating - preparation (e.g. sanding, spraying) and coating - once a year (1) - BAT 18		
	Powder - EN 13284-1 - Coating and printing of metal packaging materials - Spray application - Once a year (1) - BAT 18		
	Dust - Coating, preparation and coating of wood surfaces - Once a year (1) - BAT 18		
	TVOC - All sectors - Chimneys with TVOC loads below 10 kg C/h - Annual once (1) (2) (3) - BAT 14, BAT 15	Measurements are planned to be carried out quarterly.	Retrieved from
	TVOC - All sectors - Chimneys with TVOC loads of 10 kg C/h or more - Continuous - BAT 14, BAT 15	The projected mass flow is well below 10 kg C/h and therefore not relevant.	No relevant
	DMF - Coating of textiles, films and paper (5) - Once every three months (1) - BAT 15	The proposed technology is not included in the best available techniques, therefore irrelevant.	No relevant
	$_{NOX}$ - Flue gas heat treatment - Once a year (7) - BAT 17	The use of afterburners is not planned. Not relevant.	No relevant
	CO - Flue gas heat treatment - Once a year (7) - BAT 17	The use of afterburners is not planned. Not relevant.	No relevant
	(1) As far as practicable, measurements shall made at the highest emission levels expected under normal operating conditions.		

BAT identifier	BAT recommendation	Applied technology	Evaluation
	(2) If the TVOC load is less than 0,1 kg C/hour or if the unabated and stable TVOC load is less than 0,3 kg C/hour, the frequency of monitoring may be reduced to once every 3 years or the measurement may be replaced by a calculation, provided that it can ensure data collection of scientifically equivalent quality. *(3) For the thermal management of flue gases, the temperature of the combustion chamber must be measured continuously. An alarm system is also installed for temperatures outside the optimised temperature range.* *(4) The general EN standards for continuous measurements are EN15267-1, EN15267-2, EN15267-3 and EN 14181.* *(5) The control only applies if DMF is used in the procedures.* *(6) In the absence of an EN standard, the measurement includes DMF in the condensed phase.* *(7) For chimneys with a TVOC load of less than 0.1 kg C/hour, the frequency of inspections may be reduced to once every 3 years*		
BAT 12	**The BAT is to monitor discharges to water in accordance with EN standards at a frequency of at least. Where no EN standard is available, the BAT to be applied shall be the use of ISO, national or other international standards of scientifically equivalent quality ensure data collection.**		
	Material - Sector - Standard - Minimum frequency of monitoring		
	TSS (1) - Vehicle coating - EN 872 - Once a month (2) (3)	The proposed technology is not identical to the sectors described in the Recommendation and is therefore not relevant.	No relevant
	TSS (1) - Coating of tape rolls - EN 872 - Once a month (2) (3)		No relevant
	TSS (1) - Coating and printing of metal packaging materials (for DWI boxes only) - EN 872 - Once a month (2) (3)		No relevant
	KOI (1) (4) - Vehicle coating - No EN standard available - Once a month (2) (3)		No relevant
	KOI: (1) (4) - Coating of tape reels - Not available EN-Standard - Once a month (2) (3)		No relevant
	KOI: (1) (4) - Coating and printing of metal packaging materials (only for DWI boxes) - No EN standard available - Once a month (2) (3)		No relevant
	TIC (1) (4) - Vehicle coating - EN 1484 - Once a month (2) (3)		No relevant
	TOC (1) (4) - Coating of tape rolls - EN 1484 - Once a month (2) (3)		No relevant
	TOC (1) (4) - Coating and printing of metal packaging materials (DWI-for boxes) - EN 1484		No relevant
	Cr(VI) (5) (6) - Coating of aircraft - EN ISO 10304-3 or EN ISO 23913 - once a month (2) (3)		No relevant
	Cr(VI) (5) (6) - Coating of strip coils - EN ISO 10304-3 or EN ISO 23913 - once a year (2) (3)		No relevant
	Cr (5) (6) - Coating of aircraft - Various EN standards available (e.g. EN ISO 11885, EN ISO 17294-2, EN ISO 15586) - Yearly once (2) (3)		No relevant
	Cr (5) (6) - Coating of strip coils - Various EN standards available (e.g. EN ISO 11885, EN ISO 17294-2, EN ISO 15586) - Yearly once (2) (3)		No relevant

BAT identifier	BAT recommendation	Applied technology	Evaluation
	Ni (6) - Coating of vehicles - Various EN standards available (e.g. EN ISO 11885, EN ISO 17294-2, EN ISO 15586) - annually once (2) (3)		No relevant
	Ni (6) - Coating of strip coils - Various EN standards available (e.g. EN ISO 11885, EN ISO 17294-2, EN ISO 15586) - Yearly once (2) (3)		No relevant
	Zn (6) - Coating of vehicles - Various EN standards available (e.g. EN ISO 11885, EN ISO 17294-2, EN ISO 15586) - annually once (2) (3)		No relevant
	Zn (6) - Coating of strip coils - Various EN standards available (e.g. EN ISO 11885, EN ISO 17294-2, EN ISO 15586) - Yearly once (2) (3)		No relevant
	AOX (6) - Vehicle coating - EN ISO 9562 - Once a year (2) (3)		No relevant
	AOX (6) - Coating of tape rolls - EN ISO 9562 - Once a year (2) (3)		No relevant
	AOX (6) - Coating and printing of metal packaging materials (DWI-for boxes) - EN ISO 9562 - Once a year (2) (3)		No relevant
	F- (6) (8) - Vehicle coating - EN ISO 10304-1 - Once a year (2) (3)		No relevant
	F- (6) (8) - Coating of tape rolls - EN ISO 10304-1 - Once a year (2) (3)		No relevant
	F- (6) (8) - Coating and printing of metal packaging materials (DWI-for boxes) - EN ISO 10304-1 - Once a year (2) (3)		No relevant
	(1) Monitoring should only be carried out if there is a direct discharge to the receiving water body. *(2) The monitoring frequency may be reduced to once every 3 months if emission levels are shown to be sufficiently stable.* *(3) If the frequency of release per batch is below the minimum frequency of monitoring, it should be carried out once every so often.* *(4) Monitoring total body carbon and chemical oxygen demand are alternatives to each other. Total organic carbon is the preferred option because it does not require the use of highly toxic chemicals.* *(5) Cr(VI) control is only applicable if chromium(VI) compounds are used in the processes.* *(6) Where there is an indirect discharge to a receiving body of water, the frequency of monitoring can be reduced if the treatment plant downstream in the process is adequately designed and equipped to reduce the amount of the pollutant.* *(7) Cr control is only applicable if chromium compounds are used in the processes.* *(8) The F- control only applies when fluorine-containing compounds are used in the processes.*		
BAT 13	**The BAT to be used to reduce the frequency of OTNOC and the emissions during OTNOC is to use both of the following techniques**		
	a) Identification of critical equipment The identification of environmentally critical installations ("critical installations") is based on a risk assessment. In principle, this applies to all equipment and systems handling volatile organic compounds (VOCs) (e.g. flue gas treatment system, leak detection system).	In order to reduce the incidence of OTNOC (Other Than Normal Operating Conditions) and to reduce emissions during OTNOC, the following two techniques are used: During the environmental risk assessment carried out as part of the design, additional protection measures were incorporated and planned for the technological elements identified as risky, which were described in detail in the information are given in chapter 4.14.1.1.	Retrieved from

BAT identifier	BAT recommendation	Applied technology	Evaluation
		The experience of the applicant's existing installations has been taken into account in the risk assessment. On this basis, state-of-the-art detection equipment and automatic intervention systems have been planned. The isolation systems are based on the available have been designed taking into account the best available techniques.	
	b) Inspection, maintenance and monitoring A structured program to maximize the availability and performance of critical equipment, including standard operating procedures, preventive maintenance, and scheduled and unscheduled maintenance. OTNOC periods, their duration, their root causes and, where possible, the emissions generated during their occurrence are monitored	To maximise the availability and performance of critical equipment, a structured monitoring and maintenance programme will be put in place, including: standard operating procedures; preventive maintenance; scheduled and unscheduled maintenance. All information is recorded in the OTNOC logbook, which includes the periods, duration, causes and, where possible, emissions during their occurrence are also tracked. The data recorded in the logbook will help to improve the maintenance system and reduce OTNOC periods. Naturally, each plant (installation) contributes to the OTNOC data collection, so that OTNOC period can be minimised	Retrieved from
BAT 14	**The BAT to be applied to reduce VOC emissions from production and storage areas is an appropriate combination of technique (a) and the following other techniques.**		
	a) System selection, design and optimisation The flue gas system is , designed and optimised taking into account parameters such as: — the amount of air exhausted; — the type and concentration of solvents in the extracted air; — the type of management system (targeted/centralised); — health and safety; — energy efficiency. The following priorities may be taken into account when selecting a system taken: — separation of high and low VOC flue gases; — techniques to homogenise and increase the concentration of VOCs (see BAT 16(b) and (c)); — techniques for recovering solvents in flue gases (see: BAT 15); — VOC emission reduction techniques with heat recovery (see BAT 15); — VOC emission control techniques without heat recovery (see BAT 15).	The NMP that evaporates during drying recovered from the exhaust air by condensation in liquid form and transferred to NMP waste tanks. The recovered NMP is not recycled , it is by design such as The waste will be transferred to a third party with a waste management licence who can ensure the preparation of the waste for NMP recycling by distillation. The extraction of contaminated air is planned as close as possible to the point of application of the VOC containing materials. From extraction providing fans are equipped with variable speed technology for high energy savings. The individual process emissions are aggregated into point sources, taking into account their concentration, thus ensuring the separation of low and high VOC polluted air intakes and optimising the capture efficiency and homogenisation of VOC concentrations.	Retrieved from
	b) Air extraction as close as possible to the point of application of the VOC-containing substances Air extraction is carried out as close as possible to the point of application, with full or partial coverage of the solvent application area (e.g. coating machines, sprayers, spray booths). The extracted air can be treated with a flue gas treatment system Applicability may be limited by the shape and size of the area to be enclosed.	In order to reduce VOC emissions, direct air extraction equipment is planned to be installed on the coating and drying equipment. In practice, this means that the evaporated NMP is exhausted directly from the equipment. The exhausted air will be treated by a flue gas treatment system. UV marker ink pollutant emission of UV solidifying is extracted at the point of use and then passed through a separation device is discharged via an air pollution control point source.	Retrieved from

BAT identifier	BAT recommendation	Applied technology	Evaluation
	(c) The air is exhausted as close as possible to the preparation point of the paints/coatings/adhesives/inks (e.g. mixing area). The exhausted air can be treated with a fume treatment system. Only for use with paints/coatings/adhesives/inks.	In order to reduce VOC emissions, the mixing technology is fully enclosed, with direct exhaust of the ventilation ducts required for the technology, is discharged via a separation device air pollution control point source.	Retrieved from
	d) Air extraction during drying/treatment procedures A curing ovens/dryers with air extraction system are equipped. The exhaust air can be treated with a flue gas treatment system. For drying/marinating processes only.	Air polluted with evaporated NMP from the drying kilns is discharged to an NMP recovery system. For the NMP recovery system, the recovery of NMP-contaminated air by condensation is planned. The recovered NMP will be transferred to waste tanks. The recovered NMP will not be recycled on-site, but is planned to be transferred to a third party with a waste management permit for waste NMP distillation recycling can ensure the preparation of.	Retrieved from
	(e) Minimising fugitive emissions and heat loss from ovens/dryers by sealing the inlet and outlet points of curing ovens/dryers or by using lower than atmospheric pressure during drying. The inlet and outlet of the curing ovens/dryers are hermetically sealed to minimise fugitive VOC emissions and heat loss. Sealing can be provided by air jets or air knives, doors, plastic or metal curtains, blades, etc. Alternatively, the ovens/dryers are kept at a pressure lower than atmospheric Only use if drying ovens/dryers are used.	Since coating is an open technology, the application equipment is separated from the room and has its own local exhaust. For drying ovens, the use of lower than atmospheric pressure is planned. Thermal insulation of the outer surface of the dryers is planned to minimise heat loss. As a result, fugitive emissions of pollutants should not occur during coating or drying.	Retrieved from
	f) Air extraction from the cooling zone If the substrate is cooled after drying/treatment, the air from the cooling zone is extracted and may be treated by a flue gas treatment system Only applicable if the substrate is cooled after drying/curing.	The air from the cooling zone of the multi-zone drying kiln is also exhausted and connected to the NMP recovery system mentioned above. For the NMP recovery system, recovery of NMP from the NMP-contaminated air by condensation is planned. The recovered NMP will be transferred to waste tanks. The recovered NMP will not be recycled on-site, but is planned to be transferred to a third party with a waste management licence who will process the waste NMP by distillation can ensure the preparation for recycling.	Retrieved from
	g) Air extraction during storage of raw materials, solvents and solvent-containing wastes Air from raw material storage tanks and/or separate containers for storage of raw materials, solvents and solvent-containing wastes may be exhausted and treated by a flue gas treatment system. Not necessarily suitable for closed containers or low vapour pressure and low toxicity raw materials, solvents and solvent-containing wastes for storage.	The NMP tank and the waste NMP tank will be equipped with an end-gas outlet connected to the separation system. Other wastes potentially containing VOCs will be stored in closed containers and therefore NMP emissions will be negligible. The ventilation of storage tank farms and hazardous waste storage rooms (both normal and emergency) is connected to an air quality protection point source after appropriate isolation, thus ensuring controlled emissions.	Retrieved from
	h) Air extraction from cleaning areas	The mixing tank where the NMP is intended to be used is cleaned with NMP. The air exhaust from this tank is designed to be separated by a	Retrieved from

BAT identifier	BAT recommendation	Applied technology	Evaluation
	Areas where machinery parts and equipment are cleaned with organic solvents, either manually or automatically, can be exhausted and treated with a fume treatment system. For use only in areas where the parts and equipment of the machinery are cleaned with organic solvents.	connected to the system. In addition, only a small amount of ethanol is planned to be used for cleaning, if necessary for quality assurance reasons to remove the outer film.	
BAT 15	**The BAT to be applied to reduce VOC emissions from waste gases and increase resource efficiency is to use one or more of the following techniques use a combination of**		
	I. Capture and recovery of solvents in flue gases		
	a) Condensation A technique for removing organic compounds by reducing the temperature below the dew point of the compound to liquefy its vapours. Depending on the operating temperature range required, different coolants are used, e.g. cooling water, chilled water (typically around 5 °C), ammonia or propane. Applicability may be limited if the recovery requires energy demand is excessive due to low VOC content.	Condensation is planned to be used in the recovery of NMP. For the NMP recovery system, recovery of NMP from NMP-contaminated air by condensation is planned. The recovered NMP will be transferred to waste tanks. The recovered NMP will not be recycled on-site, but is planned to be transferred to a third party with a waste management permit for waste NMP distillation recycling can ensure the preparation of.	Retrieved from
	b) Adsorption using activated carbon or zeolites VOCs are adsorbed on activated carbon, zeolites or carbon fibre paper. The adsorbed substances are then desorbed for reuse or disposal, e.g. by steam (often on site), and the adsorbent is reused. In continuous operation, usually more than two adsorbers are used in parallel, one in desorption mode. Adsorption is also often used as a concentration step to increase the subsequent oxidation efficiency. Applicability may be limited if the recovery requires energy demand is excessive due to low VOC content.	Adsorption in an activated carbon filter is planned as part of the separation process, but no in situ regeneration of the adsorber is planned.	In part corresponds to
	c) Absorption using a suitable liquid Using a suitable liquid, , especially soluble compounds and (dust), are removed from the flue gas by adsorption. Solvent recovery is also possible, for example by distillation or thermal desorption. (For dust removal, see BAT 18.) Generally applicable.	As part of the final gas treatment, it is planned to collect the water from the scrubbers affected by NMP capture in the contaminated NMP tank, which will be transferred to a recovery organisation. The contaminated water from the gas scrubber connected to point source P39 is discharged as process wastewater to the on-site wastewater treatment plant and for pre-treatment.	Retrieved from
	II. Thermal treatment of solvents in flue gases with energy recovery		
	(d) Transfer of flue gases to a combustion plant Part or all of the flue gases are discharged as combustion air and auxiliary fuel into a combustion plant used for the production of steam and/or electricity (including combined heat and power (CHP) plants) Not applicable to final gases containing substances referred to in Article 59(5) of the IED. Applicability for safety reasons may be limited.	No afterburner is planned.	No relevant

	e) Recuperative thermal oxidation	No plans to use recuperative thermal oxidation	No relevant
BAT identifier	**BAT recommendation**	**Applied technology**	**Evaluation**
	Thermal oxidation using the heat of the end gases, e.g. inlet flue gases preheating.Generally applicable.		
	f) Regenerative thermal oxidation using a rotary air distributor without multiple beds or valves Multiple (three or five) bed oxidizer with ceramic filling. The beds are heat exchangers, which are alternately heated by the flue gases from the oxidation process and then the flow is reversed to heat the air entering the oxidizer. The flow is periodically reversed. In a valve-less rotary air distributor, the ceramic charge is contained in a single rotary vessel divided into several articles. Generally applicable.	No plans to use regenerative thermal oxidation	No relevant
	g) Catalytic oxidation Oxidation of VOCs using a catalyst to reduce oxidation temperature and fuel consumption. Waste heat can be recovered by recuperative or regenerative type heat exchangers. Higher oxidation temperatures (500-750 °C) are used to treat the flue gases from the production of coil windings. Applicability may be limited by the presence of catalyst poisons.	No plans to use catalytic oxidation	No relevant
	III. Treatment of solvents in flue gases solvent or energy without recovering		
	h) Biological flue gas treatment The flue gas is de-dusted and fed into a reactor with biofilter material. The biofilter consists of a filter bed of organic material (peat, moss, compost root wood, bark, softwood or a combination of these) or inert material (clay, activated carbon, polyurethane) on which the flue gas stream is biologically oxidised by naturally occurring micro-organisms on the filter to carbon dioxide, water, inorganic salts and biomass. The biofilter is insensitive to dust, high temperatures or significant changes in the flue gas, e.g. in its inlet temperature or VOC concentration. Supplementary nutrient supplementation may be required. Only the treatment of biodegradable solvents.	The use of the technique is not planned.	No relevant
	i) Thermal oxidation The oxidation of VOC compounds by heating flue gases mixed with air or oxygen in a combustion chamber to above the self-ignition temperature of the mixture and then maintaining high enough temperature until the mixture is completely burnt to carbon dioxide and water. Generally applicable.	The use of the technique is not planned.	No relevant
BAT 16	**The BAT to be applied to reduce the energy consumption of the system to reduce VOC emissions shall be one of the following techniques or using a combination of.**		

	a) Maintaining the VOC concentration in the flue gas treatment system with variable frequency fans	The use of variable frequency fans in the drying ovens is designed to reduce the amount of fresh air blown in and the amount of air recirculated in relation to the provision of.	Retrieved from
BAT identifier	**BAT recommendation**	**Applied technology**	**Evaluation**
	The use of a variable frequency fan with a central flue gas management system to match the air flow to the flue gas leaving the plant, if any. Applicable only to central end-gas treatment systems staged in processes such as printing.		
	b) Internal concentration of solvents in flue gases The flue gases are recirculated (internally) within the process in the curing ovens/dryers and/or in the spray booths, thus increasing the VOC concentration of the flue gases and the VOC abatement efficiency of the flue gas treatment system. Applicability may be limited by health and safety factors such as LEL and product quality requirements or Specifications.	After the NMP is recovered, the exhaust air is recycled back to the dryers as necessary to maintain the concentration required for optimal operation. However, this recirculation does not increase the VOC concentration. Instead, it ensures better energy efficiency.	Retrieved from
	c) External concentration of solvents in the flue gas by adsorptionThe concentration of solvent in the flue gas is increased by a continuous circulating flow of process air in the spray booth, which may be combined with the flue gas from the curing oven/dryer via an adsorption device. Such equipment may include:- a fixed bed adsorber with activated carbon or zeolite;- a fluidised bed adsorber with activated carbon;- a rotary adsorber with activated carbon or zeolite;- a molecular sieve.The applicability is limited to the following can be used if the energy demand is excessive due to the low VOC content.	The use of adsorption in an activated carbon filter as part of the final gas treatment is planned for the following point sources P3-P8, P10-P12, P21, P25, P27-P29, P33-P43, P50 as described in Table 73.	Retrieved from
	d) Suction chamber technique to reduce the volume of the flue gas The flue gases from the curing ovens/dryers are sent to a large suction chamber and partially recirculated as inlet air to the curing ovens/dryers. The excess air from the suction chamber is sent to the flue gas treatment system. This cycle increases the VOC content of the air in the curing ovens/dryers and reduces the volume of the final gas. Generally applicable.	The use of the technique is not planned.	No relevant
BAT 17	**The BAT to be used to reduce NOX emissions in waste gases and to limit CO emissions from the thermal treatment of solvents in waste gases is either or both of the following techniques**		

	a) Optimisation of heat treatment conditions (design and operation) The correct design of combustion chambers, combustion units and associated equipment/devices is combined with the optimisation of combustion conditions (e.g. control of combustion parameters such as temperature and residence time), with or without the use of automatic systems, and regular planned maintenance of the combustion system according to the recommendations of the suppliers Its applicability to existing plants may be limited.	No heat treatment is planned	No relevant
	b) Use of low NOX emission combustion units In the combustion chamber, the peak flame temperature is reduced, which delays the completes the combustion and increases heat transfer (increases the radiative power of the flame).	No heat treatment is planned	No relevant

BAT identifier	BAT recommendation	Applied technology	Evaluation
	the desired VOC destruction extended residence times are applied to achieve In existing plants, the applicability of design and/or operational may be limited by.		
	Table 1. *BAT-related emission levels for NOX emissions from tail gases (BAT-AEL) and from flue gas thermal treatment* *indicative emission level for CO emissions from end-gases*	No heat treatment is planned	No relevant

A véggázokkal történő NO_X-kibocsátásokra vonatkozó BAT-hoz kapcsolódó kibocsátási szint (BAT-AEL), és a füstgázok hőkezeléséből származó, véggázokkal történő CO-kibocsátásokra vonatkozó indikatív kibocsátási szint

Paraméter	Mértékegység	BAT-AEL (¹) (napi átlag vagy a mintavételi időszak alatti átlag)	Indikatív kibocsátási szint (¹) (napi átlag vagy a mintavételi időszak alatti átlag)
NO_X	mg/Nm^3	20–130 (²)	Nincs indikatív szint
CO		Nincs BAT-AEL	20–150

(¹) A BAT-AEL és az indikatív szint nem alkalmazandó, ha a füstgázokat tüzelőberendezésbe vezetik el.
(²) Előfordulhat, hogy a BAT-AEL nem alkalmazható, ha nitrogéntartalmú vegyületek (pl. DMF vagy NMP [N-metilpirrolidon]) vannak jelen a füstgázban.

BAT 18	**With tail gases from surface preparation, cutting, coating and finishing operations in the sectors and processes listed in Table 2 BAT to reduce dust emissions is one or a combination of the following techniques.**		
	a) Spray booth with wet separator (flush baffle) A vertical downward curtain of water at the back of the spray booth traps paint particles from the spray residue. The water-dye mixture collected in a reservoir and the water recycled	The proposed technology is not included in Table 2 and is therefore not relevant.	No relevant
	b) Wet washing Paint particles and other dusts in the flue gas in washing systems is by intensive mixing of the flue gas with water. see BAT 15, point c).)	The proposed technology is not included in Table 2 and is therefore not relevant.	No relevant

<table>
<tr><td></td><td>c) Dry separation of residual permeate with pre-filtering material
Process for the dry separation of spray residues using membrane filters combined with limestone as pre-filtering material for the removal of membrane fouling
to prevent</td><td>The proposed technology is not included in Table 2 and is therefore not relevant.</td><td>No relevant</td></tr>
<tr><td></td><td>d) Dry separation of residual spray with filters
Mechanical separation system, e.g. cardboard, fabric or grey limestone
using.</td><td>The proposed technology is not included in Table 2 and is therefore not relevant.</td><td>No relevant</td></tr>
<tr><td></td><td>e) Electrostatic precipitator
In electrostatic precipitators (ESP), particles are electrically charged and separated by an electric field. The material separated in a dry ESP is removed mechanically (e.g. by shaking, vibration, compressed air). In wet ESP
rinsed with a suitable liquid, usually a water-based release agent</td><td>The proposed technology is not included in Table 2 and is therefore not relevant.</td><td>No relevant</td></tr>
<tr><td></td><td>Table 2.</td><td>The proposed technology is not included in Table 2 and is therefore not relevant.</td><td>No relevant</td></tr>
<tr><th>BAT identifier</th><th>BAT recommendation</th><th>Applied technology</th><th>Evaluation</th></tr>
<tr><td></td><td>Related to the BAT on end-gas emissions from parks
emission levels (BAT-AELs)</td><td></td><td></td></tr>
<tr><td></td><td colspan="2">
2. táblázat:
A véggázokkal történő porkibocsátására vonatkozó BAT-hoz kapcsolódó kibocsátási szintek (BAT-AEL-ek)
<table>
<tr><th>Paraméter</th><th>Szektor</th><th>Folyamat</th><th>Mértékegység</th><th>BAT-AEL (napi átlag vagy a mintavételi időszak alatti átlag)</th></tr>
<tr><td rowspan="5">Por</td><td>Járművek bevonatolása</td><td>Szóróbevonás</td><td rowspan="5">mg/Nm^3</td><td rowspan="5">< 1–3</td></tr>
<tr><td>Egyéb fém és műanyag felületek bevonatolása</td><td>Szóróbevonás</td></tr>
<tr><td>Légi járművek bevonatolása</td><td>Előkészítés (pl. csiszolás, fúvatás), bevonatolás</td></tr>
<tr><td>Fém csomagolóanyagok bevonatolása és nyomása</td><td>Szórással való felvitel</td></tr>
<tr><td>Fafelületek bevonatolása</td><td>Előkészítés, bevonatolás</td></tr>
</table>
</td><td>No relevant</td></tr>
<tr><td>BAT 19</td><td colspan="3">The BAT to be applied for the efficient use of energy is the combination of techniques (a) and (b) below with an appropriate combination of techniques (c) to (h)</td></tr>
<tr><td></td><td>Management techniques</td><td></td><td></td></tr>
</table>

	a) Energy efficiency plan The Energy Efficiency Plan is part of the EMS (see BAT 1) and includes the identification and calculation of the specific energy consumption of the activity, the development of key annual performance indicators (e.g. MWh/tonne of product) and the planning of improvement targets and activities for specific periods. The plan will be adapted to the specificities of the plant in terms of process(es), materials, products, etc. The level of detail and nature of the energy performance plan and the energy balance record are generally related to the nature, scale and complexity of the installation and the type of energy sources used. It may not be applicable if the STS activity is carried out within a larger installation, provided that the energy performance plan and energy balance records of the larger installation are appropriately covers the STS activity.	The installation will have an energy management strategy (plan), which is part of the environmental management system (EMS). In addition, an energy audit will be required or the energy management system will have to be implemented in accordance with the relevant regulations. The energy management plan framework defines the key KPIs and the energy balance provides data to monitor and improve improvement opportunities. The environmental management system (EMS) defines key performance indicators (KPIs), an annual monitoring and control plan to ensure proper monitoring of energy use and energy efficiency. Energy efficiency was also a key requirement in the design of the installation.	Retrieved from
	b) Energy balance sheet Once a year, produce an energy balance sheet showing energy consumption and production (including energy exports) broken down by type of source (e.g. electricity, fossil fuels, renewable energy, imported heat and/or cooling). This includes: (i) the definition of the energy boundaries of the STS activity; (ii) information on energy consumption in terms of energy delivered; (iii) information on energy exported from the plant; (iv) information on energy flows within the energy process; (v) information on energy consumption in terms of energy consumed; and (vi) information on energy use in terms of energy consumed. use of information (e.g. Sankey diagrams or	To determine energy efficiency, an energy balance is regularly kept, checked, updated and audited.The energy balance includes the parameters defined by the BAT	Retrieved from

BAT identifier	BAT recommendation	Applied technology	Evaluation
	energy balances). The energy balance calculation is adapted to the specific are adapted in terms of process(es), materials, etc.		
	Process-related techniques		
	c) Thermal insulation of tanks and drums containing cooled or heated liquids, and of combustion and steam systems This can be achieved, for example, by: — use of double-walled tanks; — use of pre-insulated tanks; — the application of thermal insulation to combustion equipment, steam pipes and pipelines containing cooled or heated liquids Generally applicable.	Thermal insulation of the steam piping system and the hot oil piping system is planned to minimise heat loss. Thermal insulation is also applied to the elements of the cooling water and chilled water systems. Thermal insulation of the external surface of the drying equipment is planned. The use of cooled double-walled tanks and double-walled piping is planned for the electrolyte system. The cooling jackets will be insulated.	Retrieved from

	d) Heat recovery by cogeneration - CHP (combined heat and power) or CCHP (combined cooling, heat and power) Heat recovery (mainly a from steam system) for the production of hot water/steam for use in industrial processes/activities. CCHP (also known as trigeneration system) is a cogeneration system with absorption chiller that uses low-temperature thermal energy to produce chilled water Suitability may be limited by plant layout, hot gas stream characteristics (e.g. flow rate, temperature) or the appropriate heat demand Absence.	The use of the technique is not planned.	No relevant
	e) Heat recovery from hot gas streams Energy recovery from hot gas streams (e.g. from dryers or cooling zones), e.g. by recirculating them as process air using heat exchangers, in-process or external	Coated film drying uses circulated hot air, with the air being heated via hot oil heat exchangers. On the anode and cathode side, the hot air exiting the drying ovens is heated by the inlet air. used to preheat the air on the side.	Retrieved from
	f) Adjusting the flow of process air and flue gases Adjust the flow of process air and flue gases as required. This includes reducing air ventilation during downtime or maintenance Generally applicable.	Computerised process control is used. In addition, the equipment concerned will be put on standby as soon as possible after production has stopped: • The boilers are started according to the current heat demand, only the required number of boilers is operated at any time. The individual heat output of the boilers is also controlled to match the changing demand. • The eight air compressors can be started individually according to the compressed air demand, and the power of the compressors can be controlled individually. • Solvent sensors are installed in the drying ovens, which indicate ratio of fresh air blown in to recirculated air, so that only the amount of air actually blown in is ever the required amount of fresh air must be heated.	Retrieved from
	g) Flue gas recirculation in the spray booth Capture and recirculation of flue gas from the spray booth combined with efficient separation of spray residue. Energy consumption lower than when using fresh air	The use of the technique is not planned.	No relevant

BAT identifier	BAT recommendation	Applied technology	Evaluation
	From applicability health and safety considerations may be limited to.		
	h) Optimised circulation of hot air in a high volume treatment chamber using an air turbine The air is blown into a specific part of the enclosure and dispersed by an air turbine, which converts the laminar air flow into the desired turbulent flow Only for use in the spray coating sectors.	The use of the technique is not planned.	No relevant
	Table 3 *BAT-related environmental performance levels (BAT-AEPLs) specific for energy consumption*	The table below does not include the following for the proposed technology BAT-AEL	No relevant

Szektor	Terméktípus	Mértékegység	BAT-AEPL (éves átlag)
Járművek bevonatolása	Személygépkocsik	MWh/bevont jármű	0,5–1,3
	Furgonok		0,8–2
	Tehergépkocsi-fülkék		1–2
	Tehergépkocsik		0,3–0,5
Szalagtekercsek bevonatolása	Acél- és/vagy alumíniumtekercs	kWh/m^2 bevont tekercs	0,2–2,5 (¹)
Textíliák, fóliák és papír bevonatolása	Textíliák poliuretánnal és/vagy polivinil-kloriddal történő bevonása	kWh/m^2 bevont felület	1–5
Tekercselőhuzal gyártása	Huzalok 0,1 mm-t meghaladó átlagos átmérővel	kWh/kg bevont huzal	< 5
Fém csomagolóanyagok bevonatolása és nyomása	Valamennyi terméktípus	kWh/m^2 bevont felület	0,3–1,5
Hőrögzítéses rotációs ofszetnyomás	Valamennyi terméktípus	Wh/m^2 nyomott terület	4–14
Flexográfia és nem kiadvány célú rotációs mélynyomás	Valamennyi terméktípus	Wh/m^2 nyomott terület	50–350
Kiadványok rotációs mélynyomása	Valamennyi terméktípus	Wh/m^2 nyomott terület	10–30

(¹) A BAT-AEPL nem alkalmazható, ha a tekercsbevonó gyártósor egy nagyobb gyártó létesítmény (pl. acélmű) részét kép vagy kombinált gyártási láncok esetén.

BAT 20	**BAT to reduce water consumption and effluent generation from aqueous processes (e.g. degreasing, cleaning, surface treatment, wet scrubbing) is an appropriate combination of technique (a) and other techniques as follows.**		
	a) Water management plan and water audits The water management plan and water monitoring are part of the EMS (see BAT 1) and include: — the water path through the plant and the material balance for water; — setting water efficiency targets; applying water optimisation techniques (e.g. water use monitoring, water recycling, leak detection and repair). Water checks are carried out at least once a year.	The planned environmental management system includes requirements and processes for water management plans and water audits. The EMS system meets the requirements of BAT	Retrieved from

BAT identifier	BAT recommendation	Applied technology	Evaluation
	The level of detail and nature of the water management plan and water audits will generally depend on the nature, size and complexity of the operation. It may not be applicable if the STS activity is carried out within a larger installation, provided that the larger installation's water management plan and water audits adequately cover the STS activity. activities.		
	b) Countercurrent cascade flushing Multi-phase rinsing, where water flows in the opposite direction to the workpieces/carriers. Allows a high degree of rinsing with low water consumption For use in rinsing procedures.	Flushing is not planned for the facility.	No relevant

	c) Reuse and/or recycling of water Water streams (e.g. spent rinse water, wet scrubber water) are reused and/or recycled, if necessary after treatment, using techniques such as ion exchange or filtration (see BAT 21). The extent of water reuse and/or recycling is limited by the water balance of the plant, the contaminant content and/or characteristics of the water streams . Generally applicable.	The reuse of the resulting waste water is planned in the gas scrubbers after treatment in the wastewater treatment plant. The amount of water to be recycled is 23,2 $^{m3/day}$ or 7 656 $^{m3/year}$. The quality of the reclaimed water must comply with the limits in Table 94.	Retrieved from
	Table 4 *BAT-related environmental performance levels (BAT-AEPLs) specific for water consumption*	The table below does not include the following for the proposed technology BAT-AEL	No relevant

4. táblázat:

A fajlagos vízfogyasztásra vonatkozó, BAT-hoz kapcsolódó környezeti teljesítményszintek (BAT-AEPL-ek)

Szektor	Terméktípus	Mértékegység	BAT-AEPL (éves átlag)
Járművek bevonatolása	Személygépkocsik	m^3/bevont jármű	0,5–1,3
	Furgonok		1–2,5
	Tehergépkocsi-fülkék		0,7–3
	Tehergépkocsik		1–5
Szalagtekercsek bevonatolása	Acél- és/vagy alumínium-tekercsek	l/m^2 bevont tekercs	0,2–1,3 (1)
Fém csomagolóanyagok bevonatolása és nyomása	Kétrészes DWI-italdobozok	l/1000 doboz	90–110

(1) A BAT-AEPL nem alkalmazható, ha a tekercsbevonó gyártósor egy nagyobb gyártó létesítmény (pl. acélmű) részét képezi, vagy kombinált gyártási láncok esetén.

A kapcsolódó nyomon követést lásd: BAT 20, a) pont.

BAT 21	**Reduction of emissions to water and/or water from aqueous processes (e.g. degreasing, cleaning, surface treatment, wet washing)** **BAT to promote the reuse and recovery of BAT is a combination of the following techniques**		
	Preliminary, primary and general treatment		
BAT identifier	**BAT recommendation**	**Applied technology**	**Evaluation**
	a) Equalisation Equalisation of flows and pollutant loads with tanks or other treatment techniques. All pollutants.	Equalisation at the wastewater treatment plant planned	Retrieved from
	b) Neutralisation Adjusting the pH of the wastewater to a neutral level (around 7). Acids, alkalis.	Neutralisation planned at the treatment plant	Retrieved from
	(c) Physical separation, e.g. by filters, sieves, mesh separators, primary sedimentation tanks and magnetic separation Coarse , suspended , metal particles.	The heavy metal content of the wastewater is planned to be reduced first by sedimentation.	Retrieved from
	Physico-chemical treatment		

	d) Adsorption The removal of soluble substances (dissolved solids) from wastewater by depositing them on the surface of solid, highly porous particles (typically activated carbon) Adsorbable dissolved, non-biodegradable or inhibitory pollutants substances such as AOX.	-	No relevant
	e) Vacuum evaporation Removal of polluting substances by reduced pressure thermal wastewater treatment. Soluble, non-biodegradable or inhibitory , which can be distilled, e.g. certain solvents.	-	No relevant
	f) Replacement The conversion of dissolved pollutants into insoluble compounds by the addition of a precipitant. The solid precipitate formed is then separated by sedimentation, flotation or filtration Precipitable soluble, non-biodegradable or inhibitory pollutants materials such as metals.	The heavy metal content of the wastewater will be reduced first by sedimentation and then by coagulation and flocculation agents.	Retrieved from
	g) Chemical reduction In chemical reduction, pollutants are converted into similar but less harmful or dangerous compounds. Reducible soluble, non-biodegradable or inhibitory pollutants, e.g. hexavalent chromium (Cr(VI)).	Chemical reduction designed using AOP technology	Retrieved from
	h) Ion exchange Separation and exchange of ionic pollutants from wastewater to more acceptable ions using ion exchange resin. are temporarily retained and then released back into a regeneration or scrubbing fluid Ion-soluble, non-biodegradable or inhibitory pollutants, e.g. metals.	RO equipment application planned	No relevant
	i) Stripping Flushable contaminants are removed from the aqueous phase by passing a gas phase (e.g. steam, nitrogen, air) through the liquid. Removal efficiency can be improved by increasing the temperature or reducing the pressure.	-	No relevant

BAT identifier	BAT recommendation	Applied technology	Evaluation
	, e.g. some adsorbable, organically bound halogens (AOX).		
	Biological treatment		
	j) Biological treatment The use of micro-organisms to treat wastewater (e.g. anaerobic treatment, aerobic treatment). Biodegradable organic compounds.	The wastewater pre-treatment technology will have two stages (BMR and MBBR) of biological treatment.	Retrieved from
	Final removal of solids		

	k) Coagulation and flocculation Coagulation and flocculation are processes used to separate suspended solids from wastewater, usually in successive steps. Coagulation is performed by adding coagulants to the effluent with opposite charges to the suspended solids. Flocculation involves fine mixing to bring the micro-particles into collision with each other and to form larger units, called flocs. This may be facilitated by the addition of polymers Suspended solids and metals bound to particles.	These BAT steps are part of the wastewater pre-treatment process.	Retrieved from
	l) Sedimentation Separation of suspended particles by gravity settling.		
	m) Filtering Separation of solids from wastewater by passing them through a porous medium, e.g. sand filtration, nanofiltration, microfiltration and ultrafiltration		
	n) Flotation The separation of solid or liquid particles from wastewater by adhering them to fine gas bubbles (usually air). On the surface of the liquid are collected and removed by skimming.	-	No relevant
	Table 5 *BAT-related emission levels (BAT-AELs) to the receiving water body for direct introductions*		

Anyag/Paraméter	Szektor	BAT-AEL
Összes lebegő szilárd anyag (TSS)	Járművek bevonatolása Szalagtekercsek bevonatolása Fém csomagolóanyagok bevonatolása és nyomása (csak DWI-dobozok esetében)	5-30 mg/l
Kémiai oxigénigény (KOI)		30-150 mg/l
AOX		0,1-0,4 mg/l
Fluorid (F–)		2-25 mg/l
Nikkel (Ni)	Járművek bevonatolása Szalagtekercsek bevonatolása	0,05-0,4 mg/l
Cink (Zn)		0,05-0,6 mg/l
Összes króm (Cr)	Légi járművek bevonatolása Szalagtekercsek bevonatolása	0,01-0,15 mg/l
Hat vegyértékű króm (Cr(VI)		0,01-0,05 mg/l

A kapcsolódó nyomon követést a BAT 12 tartalmazza.

BAT identifier	BAT recommendation	Applied technology	Evaluation
	Table 6 *BAT-related emission levels (BAT-AELs) to the receiving water body for indirect introductions*		

Anyag/Paraméter	Szektor	BAT-AEL
AOX	Járművek bevonatolása Szalagtekercsek bevonatolása Fém csomagolóanyagok bevonatolása és nyomása (csak DWI-dobozok esetében)	0,1-0,4 mg/l
Fluorid (F–)		2-25 mg/l
Nikkel (Ni)	Járművek bevonatolása Szalagtekercsek bevonatolása	0,05-0,4 mg/l
Cink (Zn)		0,05-0,6 mg/l
Összes króm (Cr)	Légi járművek bevonatolása Szalagtekercsek bevonatolása	0,01-0,15 mg/l
Hat vegyértékű króm (Cr(VI)		0,01-0,05 mg/l

A kapcsolódó nyomon követést a BAT 12 tartalmazza.

BAT identifier	BAT recommendation	Applied technology	Evaluation
BAT 22	**The BAT to be used to reduce the amount of waste sent for disposal are techniques (a) and (b) and techniques (c) and (d) below one or both of the following.**		
	a) Waste management plan The Waste Management Plan is part of the EMS (see BAT 1) and is a set of measures designed to: 1. minimise waste generation, 2. optimising the re-use, recovery and/or recycling of waste and/or the recovery of energy from waste, and 3. ensuring proper disposal of waste.	The waste management plan for the activity will be part of the environmental management system (EMS). The waste management plan is based on the following principles: • minimise waste generation; • optimising the reuse, recovery and/or recycling of waste and/or the recovery of energy from waste; • taking care of the proper disposal of waste	Retrieved from
	b) Monitoring the quantities of waste Annual records of the amount of waste generated by type of waste. The solvent content of waste is determined at regular intervals (at least once a year) by analysis or calculation.	Waste records will be kept continuously and formal notifications will be made in a timely manner. Waste shipment receipts will be collected and archived by a digital system. Annual records of waste quantities generated by technology and waste type. The solvent content of the waste will be determined regularly (at least twice a year) by analysis or calculation. The archived data will be processed, options will be developed to reduce the quantities and monitoring will be continuous. An internal policy will be developed to ensure compliance with waste shipment documentation off	Retrieved from
	c) Solvent recovery/recycling The techniques may include: — liquid from waste solvents recovery/recycling from waste by on-site or off-site filtration or distillation; — recovery/recycling of the solvent content of wipes by gravity drying, twisting or centrifuging.	The company plans to transfer the recovered NMP generated as liquid waste to a recovery organisation, which will distill it into plans to recover. The Licensee is therefore not entitled to plans solvent recovery, but the liquid waste from NMP recovery containing high concentrations of NMP is transferred to an external service provider, a waste recovery company who will ensure the recovery of the NMP.	In part corresponds to
	d) Waste stream specific techniques The techniques may include: - reducing the water content of waste, for example by using a filter press in the for sludge treatment;	Sludge pressing is planned to reduce the water content of the waste in the treatment plant.	Retrieved from
BAT identifier	**BAT recommendation**	**Applied technology**	**Evaluation**

<table>
<tr><td></td><td>— reducing the amount of sludge and solvent waste generated, for example by reducing the number of cleaning cycles (see BAT 9);
— the use of reusable containers, the reuse of containers for other purposes or the recycling of container material;
— transport of spent limestone from dry washing to a lime or limestone cement kiln.</td><td></td><td></td></tr>
<tr><td rowspan="2">BAT 23</td><td colspan="3">BAT to prevent or, where this is not practicable, reduce emissions means developing, implementing and regularly reviewing an anti-pollution management plan as part of an environmental management system (see BAT 1) and includes the following elements
all of them:</td></tr>
<tr><td>a policy setting out measures and time limits; a policy on response to identified odour incidents, e.g. complaints; an odour prevention and abatement programme to identify the source(s), characterise the emission intensity of the source(s) and preventive measures
and/or implement measures to reduce.</td><td>No stench from the installation is expected to reach the boundary of the site, taking into account the calculations carried out on the basis of the data provided by the Designer and the Permittee.</td><td>No relevant</td></tr>
<tr><td rowspan="8">BAT 24</td><td colspan="3">The BAT to be applied to reduce the consumption of solvents and other raw materials, energy consumption and VOC emissions is to use one or a combination of the following coating systems.</td></tr>
<tr><td>a) Mixed (solvent based mixture) coating
A coating system in which a coating layer (primer or undercoat) is water-based.
Only for new plants or major plant upgrades.</td><td>-</td><td>No relevant</td></tr>
<tr><td>b) Water-based (WB) coating
A coating system in which the primer and base coat are
water-based.</td><td>-</td><td>No relevant</td></tr>
<tr><td>c) Integrated coating process
A coating system that combines a primer and a base coat
functions, and is applied by a two-step spray application.</td><td>-</td><td>No relevant</td></tr>
<tr><td>d) Process without intermediate drying
A coating system in which the primer, basecoat and transparent coating layers are applied without intermediate drying. The primer
and the base coat can be solvent-based or water-based.</td><td>-</td><td>No relevant</td></tr>
<tr><td>Table 9.
BAT-related emission levels (BAT-AELs) for total VOC emissions from coating of other metal and plastic surfaces
about</td><td></td><td></td></tr>
<tr><td>A BAT-hoz kapcsolódó kibocsátási szintek (BAT-AEL-ek) az egyéb fém és műanyag felületek bevonatolásából származó összes VOC-kibocsátásra vonatkozóan
<table>
<tr><th>Paraméter</th><th>Folyamat</th><th>Mértékegység</th><th>BAT-AEL
(éves átlag)</th></tr>
<tr><td rowspan="2">Az oldószer anyagmérlege alapján számított összes VOC-kibocsátás</td><td>Fémfelületek bevonatolása</td><td rowspan="2">kg VOC/kg bevitt szilárd anyag</td><td>< 0,05–0,2</td></tr>
<tr><td>Műanyag felületek bevona-tolása</td><td>< 0,05–0,3</td></tr>
</table></td><td>Every year, 16 612.2 tonnes of solvent are used to coat 4 231 953 tonnes of aluminium foil, corresponding to a solids input of 0.0039 kg VOC/kg.</td><td>Retrieved from</td></tr>
<tr><td>Table 10.</td><td></td><td></td></tr>
<tr><th>BAT identifier</th><th>BAT recommendation</th><th>Applied technology</th><th>Evaluation</th></tr>
</table>

<table>
<tr><td></td><td>BAT-related emission levels (BAT-AELs) for fugitive VOC emissions from coating of other metal and plastic surfaces
about</td><td></td><td></td></tr>
<tr><td></td><td>A BAT-hoz kapcsolódó kibocsátási szint (BAT-AEL) az egyéb fém és műanyag felületek bevonatolásából származó diffúz VOC-kibocsátásra vonatkozóan
<table>
<tr><th>Paraméter</th><th>Mértékegység</th><th>BAT-AEL (éves átlag)</th></tr>
<tr><td>Az oldószer anyagmérlege alapján számított diffúz VOC-kibocsátás</td><td>A bevitt oldószer százalékos aránya (%)</td><td>< 1–10</td></tr>
</table></td><td>Fugitive emissions are not expected due to the direct air venting that is planned to be installed in all installations using NMP and the closed systems.</td><td>Retrieved from</td></tr>
<tr><td></td><td>Table 11.
BAT-related emission levels (BAT-AELs) for VOC emissions from the coating of other metal and plastic surfaces with end-gases
on emissions</td><td></td><td></td></tr>
<tr><td></td><td>A BAT-hoz kapcsolódó kibocsátási szint (BAT-AEL) az egyéb fém és műanyag felületek bevonatolásából származó, véggázokkal történő VOC-kibocsátásra vonatkozóan
<table>
<tr><th>Paraméter</th><th>Mértékegység</th><th>BAT-AEL (napi átlag vagy a mintavételi időszak alatti átlag)</th></tr>
<tr><td>TVOC</td><td>mg C/Nm³</td><td>1–20 (¹) (²)</td></tr>
</table>
(¹) A BAT-AEL tartomány felső határa 35 mg C/Nm³, amennyiben olyan technikákat alkalmaznak, amelyek lehetővé teszik a visszanyert oldószer újrafelhasználását/újrahasznosítását.
(²) A BAT 16 c) pontját füstgázkezelési technikával kombinálva alkalmazó üzemek esetében a koncentrátor füstgázára az 50 mg C/Nm³ alatti kiegészítő BAT-AEL vonatkozik.</td><td>Emission values of the coating:
cathodic coating: 0,50 $^{mgC/Nm3}$
anodic coating: 0 $^{mgC/Nm3}$ (contains no VOC)</td><td>Retrieved from</td></tr>
<tr><td>BAT 25-52</td><td colspan="3">Not applicable to the proposed activity</td></tr>
<tr><td>BAT 53</td><td colspan="3">One of the following techniques to be used to prevent or, where not practicable, reduce noise emissions,
or a combination of these (Note: the BAT conclusions are numbered according to the numbering for the preservation of wood).</td></tr>
<tr><td></td><td>Storage and handling of raw materials</td><td></td><td></td></tr>
<tr><td></td><td>a) Noise walls installation and of buildings noise absorption exploiting/optimising</td><td rowspan="2">Most noise sources are installed inside buildings. Doors and windows of buildings are kept closed. For the cooling towers identified as a significant noise source, the Permittee has chosen to install noise attenuated equipment to reduce noise exposure. This way there will be no
the need to use noise barriers.</td><td rowspan="4">Retrieved from</td></tr>
<tr><td></td><td>(b) Fencing or partial fencing of noise-generating operations</td></tr>
<tr><td></td><td>c) Use of low noise vehicles/transport systems</td><td>Wherever possible, electric transport vehicles are used to transport materials on the site.</td></tr>
<tr><td></td><td>d) Noise management measures (e.g. checking and maintaining equipment, closing doors and windows)</td><td>When machines, vehicles and equipment are maintained, their noise emission parameters are also tested.</td></tr>
<tr><td></td><td>Kiln drying</td><td></td><td></td></tr>
<tr><td></td><td>e) Noise reduction measures for fans</td><td>The air handling equipment to be installed in the facility will be of modular design, where the installation of the necessary noise attenuation modules will be designed and implemented taking into account the data in the logbook and the Permittee's requirement for a maximum sound power level of 75 dB. Where noise reduction of fans associated with direct exhausts is required, the above internal requirements shall be met
noise attenuation drums will be installed there.</td><td>Retrieved from</td></tr>
</table>

141. Table 1: BAT compliance of the activity (cooling system, cooling tower operation) (Reference document on the application of best available techniques in industrial cooling systems)

BAT recommendation	Applied technology	Evaluation
Requirements for the manufacturing process and site When selecting wet, dry or wet/dry cooling technologies the main criterion is the highest overall energy efficiency. Where hazardous substances are being cooled which (from the cooling system bypassed), an indirect cooling system with a secondary cooling circuit should be used. The use of groundwater for cooling should generally be minimised, especially where there is a risk of depleting groundwater supplies.	BAT recommendations and energy efficiency are taken into account when choosing the cooling system. The following measures can reduce indirect energy consumption: - reducing the resistance to the heat exchange process through proper cooling of the cooling system maintenance, - optimise daily operations.	Retrieved from
Reducing direct energy use The energy consumption of the cooling system depends on the water in the cooling system. and/or for air small for resistance by reducing, or can be kept low by using energy-intensive equipment. Where the cooling process requires variable operating programmes, the air or water flow control optimal technological process considered.		Retrieved from
Reducing water consumption and heat emissions to water The amount of water required for cooling for the amount of heat to be dissipated linked. The higher the proportion of cooling water recycled, the less cooling water is needed for the process. Where there are insufficient or inadequate water supply, cooling water to an open or closed recirculating wet system is considered a BAT technology. For recirculation systems, BAT technology can be used to reduce the number of cycles increase, but this may be limited by cooling water treatment requirements. The use of water separators is also a BAT technology, provided that the recirculation recirculation the full recirculation process 0.01 percentage.	The cooling water cooled by open recirculation cooling towers. They use water-saving cooling towers equipped with a de-misting unit to reduce the carry-over of cooling water by the air flow. (Based on the engine logbook data, the can be reduced to 0.001%.)	Retrieved from

BAT recommendation	Applied technology	Evaluation
Reducing chemical discharges to water In accordance with the BAT procedures, the following order of priority will apply when selecting options to reduce pollutant discharges to the aquatic environment: 1. choosing a cooling system that emits lower levels of pollutants to surface water, 2. use of a more corrosion-resistant material for the construction of the cooling system, 3. preventing or reducing the leakage of substances involved in the process into the cooling circuit, 4. the use of alternative (non-chemical) cooling water treatment, 5. the selection of cooling water additives to reduce negative impact on the environment, 6. optimised use of cooling water additives (control and dosing). BAT is to avoid fouling and corrosion by proper design, thus reducing the need for cooling water treatment. BAT is the use of titanium or high quality stainless steel for single flow systems where the risk of corrosion is high. The use of materials other than titanium but with similar resistance is necessary where environmental constraints do not allow the use of titanium In recirculation systems, in addition to proper design, BAT technology also includes the concentration cycles used and the corrosion level of the material involved in the process to select the right corrosion-resistant building material. In the case of cooling towers, BAT is to select the appropriate cooling tower liner based on water quality (solids content), expected contamination, thermal and corrosion resistance, and structural materials that do not require chemical preservation. The vapour phase inhibitor (VCI) process used in the chemical industry aims to minimise the risks to water conditions in the event of a spill of substances involved in the process. The procedure considers both the level of environmental impact of a substance and the required cooling procedure and control conditions. In the case of a potentially higher risk factor during a spill, the procedure requires higher level of de-rusting methods, indirect cooling methods, and requires increased monitoring of cooling water.	When selecting additives for cooling water treatment, the less polluting alternative is chosen. The pH and redox potential of the cooling water are regularly monitored. The water treatment of the cooling water system is designed using RO equipment, which consumption can be reduced.	Retrieved from

BAT recommendation	Applied technology	Evaluation
Reducing pollutant emissions through optimised cooling water treatment In single-flow systems, the optimisation of the use of oxidising biocides depends on the timing and frequency of biocide application. BAT is to reduce biocide inputs by a combination of targeted dosing and control of macro-pollutant factors, and by exploiting the residence time of the cooling water in the system. For water treatment, and in particular for recirculation systems using non-oxidising biocides, careful decisions on the water treatment method used and its monitoring are essential for BAT technologies to be introduced. The choice of the appropriate treatment method is a complex task, taking into account a number of local and site specificities and reconciling them with the treatment additives, their quantity and a combination of.	The water supply for the cooling towers planned to be used in the facility will be ultrafiltered water (grey water) provided by the utility company, which will be further purified and chemically treated on-site. In view of the treatment in the RO and the chemical treatment, legionella growth can be excluded.	Retrieved from
Reducing emissions of pollutants into the air Reduction of pollutants emitted into the air during cooling tower operation (reduction of droplet pollutant concentrations) Where flow is the main transport mechanism, the use of droplet separators is also considered a BAT technology, provided that the entire recirculation process less than 0.01 per cent is lost as a droplet in the process.	Drops from wet cooling towers may be contaminated with chemicals that are present as residues in greywater in minimal amounts, or with cleaning and treatment chemicals used in water treatment. The cooling towers to be used will be equipped with droplet separators with an efficiency of over 99.99% according to the manufacturer. Detailed air quality modelling of the cooling towers has been carried out and the results of this modelling indicate that the environmental impact of the installation is is not significant due to the cooling towers.	Retrieved from
Noise reduction The primary measures to reduce noise are the use of low-noise equipment. Additional noise reduction up to a maximum of 5 [dB(A)]. Secondary measures include noise reduction at the inlet and outlet of fan cooling towers of 15 [dB(A)] or more. Noise abatement, in particular secondary measures to achieve this, may lead to a reduction in pressure, which can be compensated with a separate energy input.	For the cooling towers to be installed, the Licensee has opted for a factory noise attenuated version. Based on the calculations, no further noise reduction measures are justified at this stage.	Retrieved from
Leakage and microbiological risk reduction BAT is to: prevent leaks through proper design; operate within the limits set by the design; and regularly inspect the cooling system. The presence of Legionella pneumophila bacteria in the refrigeration system cannot be completely prevented, but the following can be included as BAT technologies: - eliminating stagnation zones and maintaining adequate water velocity, - optimising cooling water treatment to reduce contamination and prevent algae and amoeba growth, - regular cleaning of the cooling tower basin, - the risk of respiratory harm to operators reduction by using noise and face protection devices on the operating	Preventive maintenance and inspection are used to avoid leaks and bacterial contamination. To protect workers, a procedure for cleaning cooling towers is drawn up, setting out good practice and the personal protective equipment required for the job. It is planned to use pre-cleaning and chemical treatment to reduce the contaminant content of grey water.	Retrieved from

BAT recommendation	Applied technology	Evaluation
when entering the unit, and high-pressure cleaning of the tower during.		

142. Table 1: BAT compliance of the activity (storage of raw materials, products) (Summary Reference Document on best available techniques related to emissions from storage)

BAT recommendation - Emissions from storage	Applied technology	Evaluation
To ensure proper planning and BAT, at least the following criteria must be taken into account: 1. the physico-chemical properties of the stored substance 2. how the storage facility is operated, what level of equipment is needed, how many operators are required and what their workload is 3. how operators are informed (alerted) in case of abnormal operation 4. what protection the storage facility will be equipped with in case of abnormal operation (safety requirements, interlocking systems, pressure relief devices, leak detection and isolation devices, etc.) 5. what equipment to install - taking into account previous experience with the product (construction material, quality of valves, etc.) 6. what maintenance and supervision plan should be put in place and how to simplify maintenance/supervision work (access, site plan, etc. 7. how to deal with emergencies (distance from other tanks/facilities and their boundaries, fire protection, contact details of emergency services, e.g. fire brigades, etc.)	The investor operates several sites, so has extensive experience in both design and operation. In order to eliminate environmental risk, a site remediation plan is submitted before the start of the activity, which includes measures to prevent environmental damage and remedial measures to remedy environmental damage. The operator's documentation governing the procedures and conditions for the prevention of major accidents involving dangerous substances, the prevention of accidents and mitigation of their consequences, and the performance of notification, alert and preparedness tasks in an establishment or installation handling dangerous substances must be submitted before the start of the activity.	**Retrieved from**
Inspection and maintenance Proactive maintenance plans or risk-based monitoring plans, e.g. risk and reliability-based maintenance approach The inspection can be a routine inspection, an external inspection during operation. and an off-site internal audit.	The company plans to implement and maintain an environmental management system to ensure that responsibilities, procedures and processes are implemented, controlled and monitored.	**Retrieved from**
Location and floor plan For new tanks, it is important to carefully select the appropriate location and layout, e.g. avoiding installation in water protection or catchment areas where possible. The tank should be above ground and operating at (near) atmospheric pressure. However, in the case of on-site storage of flammable substances, the possibility of underground storage in a fenced area may be considered. For liquefied gases, depending on the quantity stored, consideration may be given to the possibility of underground storage in a reinforced container	The site is not located on a water base. The tanks will be installed with appropriate technical protection. With the exception of the slop tanks, the tanks are designed to be installed above ground in such a way that soil and groundwater contamination is not possible. The slurry tanks will be double-walled with a leak detection system, which will also prevent groundwater and geological media contamination.	**Retrieved from**
Colour of the tank According to the BAT, the colour of the tank should provide at least 70% heat or light reflectivity or, in the case of above ground tanks containing volatile substances, protection against solar radiation.	The tanks are planned to be installed inside the building, with protection from the sun by appropriate shading instead of choosing the right colour, and additional cooling for the electrolyte tanks.	**Meets / Not relevant**

BAT recommendation - Emissions from storage	Applied technology	Evaluation
The principle of emission minimisation for the storage tank Reduction of emissions with significant environmental impact from the use, transport and handling of the tank. This applies in particular to installations with large storage capacities, in which case a certain timeframe should be allowed for the to implement the introduction	There are no direct environmental emissions from the storage tanks. All emissions are treated in a final gas treatment system.	**Retrieved from**
Security management system Prevention of incidents and accidents and implementation of a safety management system for the planned activity. Operational procedures and training Put in place appropriate organisational measures, provide training and instruct workers to operate equipment safely and responsibly.	In order to eliminate environmental risk, an operational remediation plan is submitted before the start of the activity, which includes measures to prevent environmental damage and remedial measures to remedy environmental damage. Operators regulating the procedures and conditions and for the prevention of major accidents involving dangerous substances, the prevention of accidents and the mitigation of their consequences, the implementation of notification, alert and preparedness tasks in a plant or establishment handling dangerous substances documentation must be submitted before the start of the activity.	**Retrieved from**
Corrosion and/or erosion leakage Prevent corrosion by introducing the following measures: 1. choice of material resistant to the stored product 2. the use of appropriate construction techniques 3. preventing rainwater or groundwater from entering the tank, and - if necessary - to remove water that has already accumulated 4. drainage of rainwater by underground piping 5. preventive maintenance, and 6. use of corrosion inhibitors or cathodic protection inside the tank, where appropriate	The following measures are used to prevent corrosion: - the use of stainless steel tanks, - the surface of stainless steel tanks is passivated to prevent corrosion. - indoor of NMP and electrolyte tank farms, - the proper design of the drainage area to allow rapid drainage of rainwater, - Any stormwater that collects as contaminated water is collected in slop tanks. - Above-ground tank design prevents groundwater ingress, - The underground slop tanks are double-walled and equipped with leakage detectors, - Inspection of tanks at the intervals required by law, maintenance is mandatory.	**Retrieved from**
Procedures and tools to prevent overfilling Establish and maintain appropriate operating procedures, e.g. a quality management system that ensures: 1. installation of high liquid level or pressure gauges with alarm and/or automatic valve shut-off function 2. providing appropriate operating instructions to prevent overcharging, and 3. providing adequate empty space for refilling 4. The use of a stand-alone alarm system requires manual intervention and the appropriate procedures, including the installation of automatic valves in the filling system to ensure that no accident or blockage occurs in the event of a filling process shutdown. The type of alarm system to be installed must be considered for each tank separately.	To ensure the safe operation of the activity and to prevent overfilling, redundant tank gauging with PLC-controlled level sensors is planned. It is planned to install pressure transmitters and pressure sensors in the tanks. Human errors will be eliminated by PLC control. The installation of solvent vapour sensors and liquid sensors in the tank farm is planned. The sensors and control systems described above communicate with each other via the BMS system and automatic intervention is carried out if necessary.	**Retrieved from**

BAT recommendation - Emissions from storage	Applied technology	Evaluation
Instrumented detection and automation of leak detection The four basic techniques for detecting leaks are: 1. spillage prevention system 2. fluid level monitoring 3. acoustic emission method 4. monitoring the vapour content of the soil. For the proposed activity, the implementation of leak detection for tanks containing potentially soil contaminating liquids. The applicability of different techniques depends on the type of tank.	With the exception of the slop tanks, the tanks are designed to be installed above ground in such a way that soil and groundwater contamination is not possible. The slurry tanks will be double-walled with a leak detection system, which will also prevent groundwater and geological media contamination. To ensure the safe operation of the activity and to prevent overfilling, redundant tank gauging with PLC-controlled level sensors is planned. Contamination of groundwater underneath the planned tank farms can be excluded thanks to the layering.	**Retrieved from**
Soil protection around the tank - insulation In the case of above-ground storage tanks for flammable liquids or liquids with a significant risk of soil contamination or risk to nearby waters, BAT means providing secondary containment, e.g. 1. the design of protective cladding for single-layer tanks; 2. the use of a double-walled tank; 3. the use of tanks with an inner tank; 4. the use of a double-walled tank where the seepage of the pedestal is monitored; In the case of a single-walled tank, the construction of a new single-walled tank above ground level for the storage of flammable liquids or liquids posing a risk of significant soil contamination or risk to nearby water bodies, the BAT is to construct a perimeter impermeable bund. The waterproof barrier consists of the following components: 1. flexible membrane, e.g. HDPE 2. clay layer 3. asphalt surface 4. concrete surface.	Both the NMP and electrolyte tank farm will be located in the same building. The smaller intermediate tanks will be installed in the EL and AS buildings. In accordance with the relevant standards, it is planned to install appropriate damage barriers under the storage tanks. A layer system with HPDE foil and a control monitoring system is planned under the storage tanks (detailed information: section 4.14.1.1). Leak detection sensors and solvent vapour sensors will be installed and connected to the BMS system to prevent leaks and spills and to allow automatic intervention. Liquid waste stored in closed containers with appropriate technical protection areas designated for this purpose. The ventilation of the storage tank farms and the hazardous waste storage area (both normal and emergency) is connected to an air pollution control point source after appropriate separation to ensure controlled emissions. The polluted air discharged through the storage tanks' ventilation lines is also discharged after separation at an air quality point source. The slurry tanks will be of double-walled design with a leak detection system, which will also prevent contamination of groundwater and the geological medium. The tanks are made of stainless steel to ensure corrosion resistance will be passivated in favour of.	**Retrieved from**
Fire safety The need for fire safety measures should be decided on a case-by-case basis. Fire safety measures can be provided in the following ways, e.g.: 1. refractory cladding or coating 2. a firewall (for smaller tanks only), and/or 3. water cooling systems. Decisions on the purchase of fire-fighting equipment are taken on a case-by-case basis and shall be taken after consultation with the fire service.	A damage salvager is used at the tanks. Technical fire safety protection (e.g. fire walls, fire doors and walls) will be installed in accordance with fire safety regulations. The installation of flame arresters and detonation locks in the process systems is planned. Inerting of the technology will further reduce the fire risk in the storage areas.	**Retrieved from**

Prevention of leakage of contaminated substances Capacity to prevent the release of contaminated substances demand depends on local conditions, e.g. stored materials, water flow and/or	To ensure the safe operation of the activity, the installation of protection against overfilling, the measurement of the level of the tanks and the prevention of possible accidents	**Retrieved from**
BAT recommendation - Emissions from storage	**Applied technology**	**Evaluation**
proximity to a river basin. The need for protection measures should be decided on a case-by-case basis. In the case of toxic, carcinogenic or other hazardous substances, BAT is total containment.	immediate detection using designed solvent vapour sensors and liquid sensors. They check for leaks due to corrosion. BAT recommendations are taken into account are taken into account in the design.	

Overall, the proposed installation complies with the BAT requirements

8.3. All measures to promote energy efficiency, safety, prevention and reduction of pollution, in particular those referred to in Article 17.
§-fulfil the requirements set out in §

8.3.1. Specific reduction in the use of polluting substances necessary for the continuation of the activity

The site will use the most advanced technologies available at the current state of development. It should be stressed that, in the case of battery production technologies, in addition to the continuous optimisation of technological processes, the details of the use of materials typically defined in standards and specifications, from which deviations are not permitted.

8.3.2. Efficient use of materials and energy for the activity

In the design of the facility and the technology, the Licensee aimed at material and energy efficient operation.

8.3.3. Preventing emissions and reducing them to the lowest achievable level

As described in chapter 4.14.1.

8.3.4. Prevent waste generation and reduce the amount and hazardousness of waste generated, according to the waste hierarchy priority order

Efforts are made to reduce the amount of waste generated on the site. The contaminated water from the gas scrubbers, which are part of the separation technology, is discharged to the on-site wastewater treatment plant. The gas scrubbers will be supplied with recirculated treated water from the on-site treatment plant.

Preliminary plans are to transfer all waste from the technology generated at the facility to a recovery organisation. The largest volume of waste NMP will be transferred to a company that will produce industrial-grade NMP from industrial waste using distillation technology, so that the NMP can be reused on site.

8.3.5. Preventing accidents with environmental impact and reducing the environmental consequences when they occur

As described in chapter 4.14.4.

8.3.6. Preventing pollution or damage to the environment in the event of cessation of activities and restoring the environment where it has been damaged

During operation, groundwater and geological media should be tested every 5 and 10 years respectively as part of the reviews, taking into account the relevant legal requirements. It is recommended that these inspections are carried out in the vicinity of the risky technological elements, whereby a possible visual non-detectable pollution effects will become apparent during the period of operation. In the event of a complete cessation of activities, the buildings, pavements and utilities will have to be demolished, after which the site can be fully recultivated. It should be stressed that the planning area is part of the Debrecen North-West Economic Belt, which is currently under development, and therefore the need for full restoration of the area is less likely. In the event of a possible remediation, there is a greater likelihood of other uses.

9. Examination of compliance with the provisions of Article 10 (7) Government Decree 314/2005 (XII. 25.)

The 5th National Environmental Protection Programme (NEP) adopted by the National Assembly in its resolution 62/2022 (9.XII.), is tasked with defining the country's environmental objectives and the tasks and means necessary to achieve them, taking into account the country's environmental status, the development goals of society and the obligations arising from international cooperation and EU membership. On the basis of Act LIII of 1996 on the Protection of Nature, the Programme includes the National Nature Conservation Basic Plan V, which is contained in Annex 1 to the Programme. The objectives of the Programme are in line with the 8th EU Environment Action Programme and the sustainable development goals of Agenda 2030. The overall objective of the NAP is to improve the environmental status of Hungary and to ensure the environmental conditions for sustainable development. As part of this, the environment has an overarching responsibility to contribute to the socio-economic development of the country, the protection of the health and quality of life of Hungarian families and communities through the high quality of its tasks, while at the same time taking conscious action against environmental pressures, the degradation of natural values and the inappropriate use of natural resources, supporting the raising of environmental awareness in society. This requires a comprehensive, systemic approach and the integration of environmental considerations into all aspects of life.

Chapters 6.8 and 6.9 of the NRP deal with the contribution to the development and implementation of EU environmental policy and international cooperation, so meeting the objectives of the NRP also supports Hungary's obligations under international treaties on the environment or nature conservation.

The overall objective of the 5th NSDP is to contribute to ensuring the environmental conditions for sustainable development by
4 strategic objectives and 2 horizontal objectives have been identified to achieve the following:

- Strategic objectives:
    1. Improving environmental conditions for human health and quality of life, reducing the impact of environmental pressures
    2. Protection, restoration and sustainable use of natural values and resources
    3. Improving resource saving and efficiency, greening the economy and strengthening the circular economy
    4. Improving environmental safety
- Horizontal objectives:
    1. Strengthening the environmental awareness of society
    2. Improving resilience to climate change

In order to achieve the strategic objectives, 22 strategic areas have been identified and their compliance is assessed in the table below. The assessment focuses on the tasks identified for the organisations.

143. Table 3: Assessment of compliance with the National Environment Programme

Strategic area	Objectives to be achieved	Assessment of consistency with objectives
Improving air quality	Use and develop Best Available Techniques (BAT) to minimise emissions in line with scientific and technical progress.	The air quality of the planned installation sources of protection as described in chapter 7.1.8.12 meet the best available the expectations of the techniques. The company is constantly exploring further ways to increase efficiency.
Reducing noise pollution	No targets or tasks for managing organisations have been set	According to the internal rules of the Licensee, the the noise emitted by air handlers and extractors to the outside is attenuated to LW = 75 dB. The cooling towers will be of noise attenuated design for procurement.
Ensuring healthy drinking water	No targets or tasks for managing organisations have been set	The Licensee plans to supply the process water demand and cooling towers with grey water. Drinking water is intended to be used only for social water needs. The permit applicant shall investigate the possibility of further use of stormwater.
Wastewater disposal and treatment, sewage sludge treatment and recovery	No targets or tasks for managing organisations have been set	The Permittee shall use an on-site wastewater treatment plant for the pre-treatment of process wastewater plans to develop. The treated wastewater will be recycled and reused in gas scrubbers.
Protecting green spaces, developing green infrastructure	Greening of the site. Support for local green space actions. Active social involvement in the green spaces of the municipality where the company is located Developers.	The site is in compliance with the regulatory plan and local building regulations appropriate planting is planned. Consultations between the Permittee and DMJV are planned for the implementation of local green space actions and municipal green space improvements.

Biodiversity conservation, nature and landscape protection	Taking into account management and land use recommendations in Natura 2000 conservation plans.	The planning area does not contain any nature conservation or NATURA 2000 sites touches. Natural assets in the planning area were not detected during the investigations. A
Strategic area	**Objectives to be achieved**	**Assessment of consistency with objectives**
		including the planning area of North Western Economic Belt industrial environment.
Soil protection and sustainable use	In the case of investments involving the use of agricultural land, compliance with soil protection rules (the humus layer of the soil in the areas affected by the investment or construction and to protect the quality of the surrounding soils).	The proposed facility will be located in the North-Western Economic Belt, on set-aside land. Humus removal in the area will be carried out in accordance with the relevant has been properly implemented. The planning area and the north-facing establishing protective forests between farmland is planned, thereby reducing the potential pressure on agricultural land.
Protection and sustainable use of our waters	Reducing the environmental burden of water use in industry, energy and agriculture. Implement measures to promote water saving and efficient use.	The Licensee plans to supply the process water demand and cooling towers with grey water. Drinking water is intended to be used only for social water needs. The Permittee shall use an on-site wastewater treatment plant for the pre-treatment of process wastewater plans to develop. The treated wastewater will be recycled and reused in gas scrubbers.
Environmental remediation	Targets for managing organisations, tasks not specified	No need for remediation in the planning area has .
	The extraction and use of resources should be based on the use of innovative, best available and resource-efficient technologies, respecting the environment and reducing the burden on.	For the installation, the energy efficient and environmentally friendly operation was a primary consideration in the design concept in the development of.

Promoting environmentally friendly production	To companies more environmentally aware (environmental responsibility), environmental the application of principles and methods to improve its performance (e.g. life-cycle approach, eco-efficiency, EMAS, environmental management systems - e.g. Environmental, Social and Governance (ESG) corporate green management strategy, voluntary	The Licensee plans to implement an integrated management system in accordance with ISO 14001 and ISO 45001, taking into account the relevant BATC requirements.
Strategic area	**Objectives to be achieved**	**Assessment of consistency with objectives**
	environmental agreements, best available technique).	
	Sustainable product design is a process increased attention to aspects such as ecological footprint, material and energy saving /-efficiency, product durability/lifetime, the repairability, reusability, recyclability.	These aspects are taken into account on an ongoing basis by the Licensee already for its existing facilities and planned for the proposed facility.
	Developing local, regional cooperation to increase resource efficiency, to to promote an industrial ecology approach.	Local cooperation will be supported by the training and education programme planned with the University of Debrecen. research agreement.
	Providing consumers with easy-to-understand and reliable information on about products and their environmental aspects (e.g. eco-labelled products or products with the EU Ecolabel).	THE EUROPEAN PARLIAMENT AND THE COUNCIL (EU) taking into account REGULATION 2023/1542, all information in the Regulation is shared with consumers.

Improving energy saving and efficiency, increasing the use of renewable energy	Based on a full life-cycle analysis of the energy production and service process (including raw material production, supply, transportation and sales activities) increase efficiency, minimise emissions and environmental pressures (e.g. technology development, combined heat and power generation, transport energy demand and loss reduction)	A full life cycle analysis can be carried out once the supply chain has been established.
	The economical and efficient use of energy in production and service activities implementation (e.g. own renewable energy production, production processes energy efficiency upgrades, using the best available technology, eco-innovation).	The planned facility will include the installation of a solar photovoltaic system. The energy efficient and environmentally friendly operation of the facility is a priority was a key consideration in the development of the design concept.
Strategic area	**Objectives to be achieved**	**Assessment of consistency with objectives**
	Sustainable use of renewable energy sources, compliance with environmental standards.	The planned facility will include the installation of a solar photovoltaic system. The energy efficient and environmentally friendly operation of the facility is a priority was an aspect of the design concept in the development of
	Developing local, regional cooperation in the to increase energy efficiency, and to promote an industrial ecology approach.	Local cooperation is supported by the Debrecen Training and research agreement to be established with the university.

Waste management	Introduction of low-waste technologies and products. Manufacturing and marketing of durable and reusable consumer goods. Collection and treatment of waste from products covered by extended producer responsibility Addressing. Compliance with take-back and recovery obligations. Take-back and re-use schemes, developing and operating repair networks.	Rechargeable and drainable batteries are an alternative to single-use batteries. The Licensee shall endeavour to minimise the generation of waste and to transfer the waste generated to a recovery organisation. The Licensee's obligations regarding extended producer responsibility, if he/she wishes to comply with the relevant legal requirements by using an intermediary organisation.
Reducing greenhouse gas emissions, preparing for the impacts of climate change	For installations covered by the EU emissions trading scheme, the relevant EU requirements are fully enforce. Using best available technology to reduce greenhouse gas emissions as much as possible. Particularly vulnerable to climate change sectors to address long-term impacts assessing and integrating aspects and requirements of preparation into production processes	The performance of the boilers to be installed with regard to the Permittee, the Permittee will be subject to the EU Emissions Trading Scheme. The relevant EU requirements will be fully enforced. For boilers, the use of best available techniques is planned. Preparing for the long-term impacts of climate change the proper sizing of the cooling system, the installation of electrolyte tanks in the building installation, ensuring the right temperature range for lower energy consumption, and the stormwater management system and pavements
Strategic area	**Objectives to be achieved**	**Assessment of consistency with objectives**
		proper design of stormwater peaks to protect against the effects of.

Environmental aspects of the agricultural economy	The use of environmentally friendly farming practices adapted to agro-ecological conditions, taking into account climate change adaptation considerations (e.g. environmentally friendly and soil-friendly agrotechniques, crop rotation, crop structure, nutrient supply, micro-irrigation; erosion control; integrated pest management; burning of stubble avoid). The cross-compliance system (Statutory management requirements, Good Agricultural and Environmental Condition). In the context of animal husbandry (e.g. animal husbandry technology, feeding, manure storage and distribution), environmental and climate protection taking into account. Providing manure storage facilities on livestock farms with adequate technical protection. Adherence to good agricultural practice is the nitrate sensitive areas	The strategic area is not relevant to the project
Environmental aspects of forest management	Environmentally sound use of afforested areas (e.g. silvicultural management, other silvicultural and forest management practices to ensure continuous forest cover and composition, control of aggressively spreading alien tree and shrub species). Afforestation and forests restructuring (e.g. afforestation; promoting the interconnection of forest blocks; replacing non-native tree species with nativethe area of production	The strategic area is not fundamentally relevant to the project, but it should be stressed that the area to implement the planned afforestation will be carried out using native tree species typical of the Great Forest.
Strategic area	**Objectives to be achieved**	**Assessment of consistency with objectives**
	tree stands, the core of the forests of charcoal origin	

	origin).	
From mineral resources about environmental aspects of mineral management	Exploration and extraction of mineral resources is the best available technologies, reducing the burden on the environment. Complete and complex landscape management of the areas affected by mining. In the extraction of favourable occurrences, the less favourable, but still economically exploitable mineral deposits or occurrences prevent the destruction of. Exploitation of mining and industrial installations (e.g. barren hydrocarbon wells), barren materials and secondary raw materials, taking into account environmental aspects. Prevent and reduce pollution and pollution from mining water extraction. Adverse impacts on the natural and urban environment from the mining and transport of raw materials (e.g. gravel, sand) prevention and reduction of.	The strategic area is not relevant to the project
Transport and environment	Continue modernisation of the railway fleet and bus fleet. Promote aircraft technology development and improve the efficiency of air traffic practices to reduce emissions and promote the use of the to promote the spread of activities. Alternative transport options examining fuel use, exploiting domestic opportunities	As part of the planned development, BMW electric car factory, so the design of the facility is geared towards electromobility advocates.
Tourism and environment	Only the relevant points are included below to highlight:	The strategic area for the project is basically irrelevant, but the
Strategic area	**Objectives to be achieved**	**Assessment of consistency with objectives**

	Natural and environmental values developments and programmes to present the EU in a sustainable way implementation, especially in the area of nature parks. Encouraging and promoting the use of environmentally friendly modes of transport. Developing public relations (press article, TV programmes, books, etc.), modern IT and communication tools developing and operating an information and visitor information network.	Licence applicant is committed to in developing environmental awareness, promoting public information and the development of environmentally friendly modes of transport.
Chemical safety	Achieving the lowest possible environmental impact in the production and use of chemicals, life-cycle thinking in product design the use of less hazardous chemicals preference for the use of substances or products containing such substances. Reducing the hazardousness of biocides and used. Research on the (combined) effects of chemicals on health and the environment.	The substitution of the intended substances is limited with regard to industrial requirements, as significant can affect the quality of the product. Application of biocides in cooling towers planned in connection with the preparation of water, only to the extent necessary. For the installation a disaster management permit is required.
Nuclear safety, radiation protection and environment	Reduction and elimination of radioactive contamination of thermal power plants by incineration fly ash and slag	The strategic objective is not relevant to the project, but it should be noted that the installation of X-ray technology planned application. In the plant only closed the use of radiation sources is planned, no radioactive sources other than X-ray or β-ray sources are used, and no nuclear energy is used radioactive discharges into air and water and their effects on the environment. 15/2001 (VI. 6.) KöM on the control of the
Strategic area	**Objectives to be achieved**	**Assessment of consistency with objectives**

		radioactive waste covered by the Regulation emissions to water or air.
Environmental damage prevention and remediation	Compliance with regulations on the transport and handling of hazardous substances. Safe, environmentally friendly industrial to prevent and effectively remedy potential environmental damage. Hazardous plant operations safety preparing and updating analyses/reports.	Transport of dangerous goods to the site in ADR compliant packaging, in compliance with the relevant regulations planned. The materials used in the facility transport and transfer is planned without endangering the environment. For the installation a disaster management permit is required.

10. The indirect impact of environmental impacts on the health of the population

The impacts of the installation on groundwater and geological media are not considered to be significant, subject to compliance with technological instructions, good industrial practice and appropriate technical discipline, and therefore, indirect (direct) impacts on health cannot be assessed.

Emissions will not exceed the emission limit value due to the high-efficiency capture equipment planned to be installed on the point sources in the installation. The model runs also indicate that the expected emission concentrations are below the limit value over the entire study area (including the area within the fence of the facility) and at all times, so that they do not cause exposure exceeding the health limits or design guideline values. In the indoor areas and work areas affected by the production, compliance with not only environmental but also occupational health and safety regulations will be mandatory, thus protecting the health of the workers.

The expected operational noise exposure, based on the calculations carried out on the basis of the noise emission data provided, does not exceed the limit value even in front of the nearest facades to be protected. No harm to the public from noise exposure related to the operation of the installation is therefore expected. Workers on the site and in the surrounding industrial areas should be provided with the protective equipment specified below in accordance with the noise protection requirements for the workplace and the use of personal protective equipment (ear protection) should be required in each work area in accordance with the maximum noise exposure level measured there and, if necessary, working hours should be restricted. The precise definition of this will be possible in the future work safety plans, based on noise measurements at the workplace.

On the roads concerned, the 0.1 dB increase during construction on the northern access road to the M35 motorway (at night), the eastern section of the BMW Boulevard (daytime), the western section of the BMW Boulevard (daytime) and the southern section of the BMW Boulevard (daytime and night-time) will not result in the limit values being exceeded, nor will it exceed the limit of detection (0.5 dB). The increase of 1,4 dB in the northern part of BMW Boulevard during the day and 2,6 dB during the night does not result in an exceedance of the limit values, but exceeds the limit of detection (0,5 dB). Along the road sections studied, the noise limits are not expected to be exceeded at the facades of the buildings to be protected on the basis of the model analyses.

During the operational period, the resulting increase of 0.1 dB is below the human detection threshold (0.5 dB) on the main road 33, the road 354, the northern access road to the M35 motorway, the eastern section of the BMW Boulevard and the southern section of the BMW Boulevard. The increases of 2.4 dB and 4.1 dB for the northern section of the BMW Boulevard and 0.7 dB and 2.4 dB for the western section of the BMW Boulevard represent a perceptible change. For all the road sections considered, it can be stated that the expected loads at the buildings to be protected are below the limit value. According to the provisions of Article 7 of Government Decree 284/2007 (X.29.), it is not necessary to define the area of influence of the transport activity for the northern section of the BMW Boulevard, where the increase in the night-time period is 4.1 dB, i.e. more than 3 dB, because the areas adjacent to the road section are not to be protected from noise. Taking into account the background noise levels at the protected areas, the noise increment generated will not represent a significant change in the perceived actual noise exposure.

In the long term, the increases do not exceed the limit value for the road sections under investigation, but the increase is noticeable on the northern and western sections of the BMW ring road (above 0.5 dB).
Based on the provisions of § 7, it is not necessary to define the scope of the transport activity for the northern section of the BMW ring road, where the increase in the night-time period is 3.7 dB, i.e. more than 3 dB, as the areas adjacent to the road are not to be protected from noise.

Due to the exposure levels not exceeding the limit value and the long distance to the buildings to be protected, no health effects are likely to occur.

The composition of the municipal wastewater discharged from the plant does not differ from that of the wastewater from households, and the amount of wastewater discharged causes an imperceptible increase in the urban wastewater balance. Kitchen waste water is pre-treated on site. The discharged wastewater can be treated in a public sewer and from there to the Debrecen Municipal Wastewater Treatment Plant, and the treated wastewater can be discharged into the Tócó stream together with the municipal wastewater.

Industrial waste water is discharged to the internal waste water treatment system with back-up as described above. Wastewater treated at the treatment plant can be discharged into the industrial wastewater sewer network to be built by Debreceni Vízmű Zrt. or, after further treatment, used in gas scrubbers to separate point sources.

The purity of the water vapour released into the atmosphere through the cooling system is ensured by pre-cleaning systems. The extent of the potential impact of the water vapour emitted by the cooling towers cannot be determined in the absence of micro-meteorological studies, but plant experience suggests that it does not cause local changes of any appreciable magnitude. Based on the calculations presented in the relevant annex, the expected immission concentrations of potentially harmful substances emitted by the cooling towers are expected to be significantly below the health limits and design guideline values and will therefore not have a direct impact on the biosphere in the area. Climatic conditions will not be affected in a health-related way by the amount of water vapour emitted.

Hazardous and non-hazardous waste and production scrap generated during production are handed over to a subcontractor with the appropriate qualifications and a licence to handle them. The waste is thus managed in accordance with the regulations, but away from the site and independently of its operations. An exception to this is the waste management activity planned to be carried out in the BS and BD buildings, where, inter alia, batteries that cannot be discharged by normal methods will be de-energised. The de-energisation will take place in closed, environmentally controlled conditions, with high-efficiency systems for the extraction and separation of air pollutants.

Overall, the environmental impacts of the installation are not expected to cause significant adverse effects on the adverse health effects.

However, it must be stressed that all these statements are made in the normal course of the factory's operation and that the health of the workers and the public concerned is guaranteed if they are fully and at all times respected and enforced. The accurate and open operation of the proposed monitoring network, the regular and transparent operation of the installation at all times and all its details, in accordance with the regulations, industrial good practice and the highest technological discipline, is the basis for safeguarding the environment and human health.

Although there is no direct impact on human health, the lack of public confidence in large and/or battery industry investments means that it is recommended to communicate the plant to the public, to voluntarily measured emissions, to organise open days to explain the plant's operation to the affected and interested public, and to deal with questions and possible complaints about the operation in an honest, prompt and professional manner, in partnership with the public. The key to transparency and prevention is compliance with the requirements of the authorities and support for regular inspections, professional and continuous operation of monitoring systems, up-to-date keeping of records (hazardous materials and waste, accidents, work logs, health and safety records, etc.). Another important element in ensuring ongoing compliance and compliance with standards is the continuous and proactive analysis and evaluation of operational parameters and measured process emission indicators, and the introduction of technological, health and safety, procedural modifications or innovations based on the evaluation, where necessary.

11. Hungary new, abroad already used in other countries foreign reference for the introduction of a new technology

No new technology is planned to be introduced at the facility.

12. Methods and measures for the monitoring and continuous control of emissions from the installation

12.1. Air pollutant point sources

Information on the measurements required at air pollutant point sources is described in chapter 7.1.3.3.

An operating logbook will be kept of the point sources of air pollution operating on the site and the operation of the associated process equipment, providing up-to-date information on:

- operating times of process equipment and extraction equipment (with quarterly aggregation),
- data having an impact on the emissions of air pollutants (quantities of substances used by type with quarterly aggregates, their composition, qualitative characteristics, etc.),
- the cause, time and duration of any malfunctions or abnormal operating conditions which have occurred, and the measures taken to remedy them,
- the timing and duration of maintenance (repairs) that have a significant impact on emissions and the change in emissions as a result of maintenance.

The plant logbook is closed at the end of each calendar year, summarised and sent to the Environmental Protection Agency by 31 March of the year following the year in question, together with the annual air quality report.

12.2. Groundwater and geological medium

12.2.1. Construction period

During the construction period, materials used in the operation will not yet be on site. During construction, the operation of construction equipment may result in the release of environmentally harmful substances due to malfunctions and accidents (collisions, overturning, sudden and damage) and, to a limited extent, from the construction materials supplied.

Therefore, a general monitoring of the geological medium and groundwater, covering a narrower range of components, is proposed for the construction period. Since the whole area will be used as a construction site and will be carried out at different locations at different stages of construction, we can only propose a steady grid of studies over the whole area.

As an alternative, it is proposed to carry out quarterly soil and groundwater tests at or around the monitoring wells below at the four skyline boundaries of the site (monitoring wells 1, 6, 7, 8 or their surroundings) and in the vicinity of the future hazardous waste storage (well 4) and the SP building (well 5). Laboratory analysis of water samples taken from monitoring wells at these six points on a temporary basis, or if logistics , after permitting, on a permanent basis, and soil samples taken from the upper layer (during drilling), 1 m, 2 m, and the capillary zone, is proposed for the following components:

- TPH, BTEX, PAH (soil and groundwater samples)
- metals according to Government Decree 6/2009+ Cr(VI) - (soil and groundwater samples)
- SEM (groundwater samples)

12.2.2. Period of operation

Considering that the groundwater monitoring system is intended to provide information on the contamination status of groundwater entering and leaving the planning area, it is proposed to locate the monitoring wells as follows:

1. Eastern boundary of the planning area (around the EM porta building)
2. The environment of the NMP tank farm (NT building environment)
3. The electrolyte tank farm environment (ET building environment)
4. Surroundings of the operational assembly point (DW building)
5. The environment of the wastewater treatment plant (PS building)
6. Western boundary of the site (FO building perimeter)
7. Southern boundary of the planning area (around the LO porta building)
8. Northern boundary of the planning area (along the northern boundary)

The monitoring wells are proposed to be located at the following EOV coordinates.

144. Table 1: Proposed location of monitoring wells

ID	EOV X	EOV Y
1	251455	835979
2	251504	835900
3	251462	835474
4	251604	835226
5	251396	835258
6	251192	835674
7	251476	835625
8	251524	835636

At the above test points, the following pollutants are tested on groundwater samples taken at six-monthly intervals proposed:

1. Metals and semi-metals according to 6/2009+ Mn+ Li, TPH, NMP, DMC, EC (as glycol), EMC, PAH, imidazole
2. Metals and semi-metals according to 6/2009+ Mn+ Li, TPH, NMP, DMC, EC (as glycol), EMC, PAH, imidazole
3. Metals and semi-metals according to 6/2009+ Mn+ Li, TPH, NMP, DMC, EC (as glycol), EMC, AVC, imidazole
4. Metals and semi-metals according to 6/2009+ Mn+ Li, TPH, NMP, DMC, EC (as glycol), EMC, AVC, imidazole
5. Metals and semi-metals according to 6/2009+ Mn+ Li, TPH, NMP, DMC, EC (as glycol), EMC, AVC, imidazole
6. Metals and semi-metals according to 6/2009+ Mn+ Li, TPH, NMP, DMC, EC (as glycol), EMC, AVC, imidazole
7. Metals and semi-metals according to 6/2009+ Mn+ Li, TPH, NMP, DMC, EC (as glycol), EMC, AVC, imidazole

In addition to the above, the following contaminants are proposed to be tested for in production at the above test points for the following substances in groundwater samples from four wells on the site boundary at annual intervals:

1. phenols, halogenated aromatic and aliphatic hydrocarbons, phthalates, iodide, ethanol, methanol, ethyl methyl ketone, 1-butyl acetate, volatile GC-MS overview
6. phenols, halogenated aromatic and aliphatic hydrocarbons, phthalates, iodide, ethanol, methanol, ethyl methyl ketone, 1-butyl acetate, volatile GC-MS overview
7. phenols, halogenated aromatic and aliphatic hydrocarbons, phthalates, iodide, ethanol, methanol, ethyl methyl ketone, 1-butyl acetate, volatile GC-MS overview imidazole

8. phenols, halogenated aromatic and aliphatic hydrocarbons, phthalates, iodide, ethanol, methanol, ethyl methyl ketone, 1-butyl acetate, volatile GC-MS overview

Due to the closed system of production and the rigorous and modern production technology, annual monitoring tests are proposed for sampling the geological medium. Before the construction of the facility, a detailed soil and groundwater contamination study covering all materials used and stored on site was carried out in the attached baseline study (and during the additional studies). The presence of these substances in the deeper soil layers will only be measurable for contaminants in liquid form and/or readily soluble contaminants that are readily mobilised in the aqueous phase and only over a long time scale. It is proposed to investigate the soil and shallow geological layers along the four cardinal site boundaries of the site (around monitoring wells 1, 6, 7 and 8), around monitoring well 5 (around the PS building, east of its N-S axis, offset towards the electrolyte plant) and around the hazardous waste storage building (DW building, monitoring well 4). The proposed locations are indicated by the monitoring well identifiers, but the sampling locations are not tied to the monitoring wells, but are proposed to be located in their vicinity (the location of the monitoring wells is determined by the sensitive and potentially polluting technologies, which justifies soil monitoring studies in their vicinity).

Annual soil monitoring is proposed for the following pollutants from surface, subsurface 1 m and capillary zone samples:

1. TPH-BTEX_PAH, 6/2009, metals and semi-metals, lithium, vanadium, thallium, beryllium, titanium, N-methyl pyrolidone, glycols, phenols, halogenated aromatic and aliphatic hydrocarbons, phthalates, iodide, ethanol, methanol, ethyl methyl ketone, 1-butyl acetate, imidazole, volatile GC-MS overview, sodium (Na hydroxide; NAOH), soil extract chloride (HCl), bromide (HBr), nitrate ($_{HNO3}$), phosphate ($_{PO4}$)
4. TPH-BTEX_PAH, 6/2009, metals and semi-metals, lithium, vanadium, thallium, beryllium, titanium, N-methyl pyrolidone, glycols, phenols, halogenated aromatic and aliphatic hydrocarbons, phthalates, iodide, ethanol, methanol, ethyl methyl ketone, 1-butyl acetate, imidazole, volatile GC-MS overview, sodium (Na hydroxide; NAOH), soil extract chloride (HCl), bromide (HBr), nitrate ($_{HNO3}$), phosphate ($_{PO4}$)
5. TPH-BTEX_PAH, 6/2009, metals and semi-metals, lithium, vanadium, thallium, beryllium, titanium, N-methyl pyrolidone, glycols, phenols, halogenated aromatic and aliphatic hydrocarbons, phthalates, iodide, ethanol, methanol, ethyl methyl ketone, 1-butyl acetate, imidazole, volatile GC-MS overview, sodium (Na hydroxide; NAOH), soil extract chloride (HCl), bromide (HBr), nitrate ($_{HNO3}$), phosphate ($_{PO4}$)
6. TPH-BTEX_PAH, 6/2009, metals and semi-metals, lithium, vanadium, thallium, beryllium, titanium, N-methyl pyrolidone, glycols, phenols, halogenated aromatic and aliphatic hydrocarbons, phthalates, iodide, ethanol, methanol, ethyl methyl ketone, 1-butyl acetate, imidazole, volatile GC-MS overview, sodium (Na hydroxide; NAOH), soil extract chloride (HCl), bromide (HBr), nitrate ($_{HNO3}$), phosphate ($_{PO4}$)
7. TPH-BTEX_PAH, 6/2009, metals and semi-metals, lithium, vanadium, thallium, beryllium, titanium, N-methyl pyrolidone, glycols, phenols, halogenated aromatic and aliphatic hydrocarbons, phthalates, iodide, ethanol, methanol, ethyl methyl ketone, 1-butyl acetate, imidazole, volatile GC-MS overview, sodium (Na hydroxide; NAOH), soil extract chloride (HCl), bromide (HBr), nitrate ($_{HNO3}$), phosphate ($_{PO4}$)
8. Metals and semi-metals according to TPH-BTEX_PAH, 6/2009, lithium, vanadium, thallium, beryllium, titanium, N-methyl pyrolidone, glycols, phenols, halogenated aromatic and aliphatic hydrocarbons, phthalates, iodide, ethanol,

methanol, ethyl methyl ketone, 1-butyl acetate, imidazole, volatile GC-MS review, sodium (Na hydroxide; NAOH), soil extract chloride (HCl), bromide (HBr), nitrate ($_{HNO3}$), phosphate ($_{PO4}$)

12.3. Stormwater

Stormwater is collected in a closed system and discharged at three points. Prior to discharge, the concentrations of the following potential pollutants are regularly monitored (and their location indicated in the permit plans) upstream of the point of discharge, in consultation with the competent authority:

- copper, nickel, cobalt, aluminium, manganese, lithium
- total aliphatic hydrocarbons (TPH)
- N-methyl-2-pyrrolidone (NMP), dimethyl carbonate (DMC), ethylene carbonate (EC), ethyl methyl carbonate (EMC), glycol

Instead of volatile organic pollutants, it is recommended to consider TOC measurement to speed up the analysis. If further testing is required based on the results of the TOC measurement (taking into account the TPH study), this can be carried out using the samples purchased and archived in parallel, but in this case it can be assumed that the stormwater is contaminated and the necessary interventions can be initiated.

12.4. Noise protection

After occupation, a standardised noise monitoring measurement is carried out annually in front of the nearest protected areas, buildings and premises and at the nearest boundary of the site of the establishment to protected areas, buildings and premises. Considering that the most significant noise sources in the installation are the cooling towers, whose noise emissions depend on the external temperature and the increase in power demand caused by the external temperature, it is proposed to carry out the monitoring measurement during the summer period. It should be stressed, however, that the noise impact of facilities already in operation or under construction is unlikely to be decoupled from the noise impact of the proposed facility, and it is therefore proposed to consider the possibility of coordinating the annual monitoring noise measurements with the periodic shutdown of other facilities, or the periodic shutdown of the battery plant.

12.5. Urban waste water

The separated urban wastewater network discharges only wastewater of municipal origin, in compliance with the regulations on the discharge and use of water pollutants as laid down in Government Decree 28/2004 (XII. 25.) KvVM. The MU building will be equipped with an external grease trap adapted to the kitchen technology.

12.6. Technological wastewater

On the basis of the data provided by the designers, the technological effluent discharge limit values according to point 33 of Annex 2, No.2 of the Decree No.28/2004 (XII. 25.) are not justified. In view of the above, the quality of the pre-treated wastewater discharged from the site must comply with the limits for the discharge of process wastewater into the sewer, as stated in the declaration of the receiving body, Debreceni Vízmű Zrt.

Pursuant to Article 28 (A) Government Decree No. 220/2004 (VII. 21.) on the Rules for the Protection of Surface Water Quality, the self-monitoring discharger is obliged to prepare a self-monitoring plan with the content specified in the Ministerial Decree on the Detailed Rules for the Control of Used and Wastewater Discharges, which must be sent to the water protection authority by electronic means and to the service provider. The frequency of sampling shall be determined by the water protection authority together with the adoption of the self-monitoring plan, specifying the limit values to be taken into account and tested.

12.7. Operational damage management plan

Given that the construction permit approval of the buildings planned to be erected can after the issuance of the single environmental permit, some of the data required for the preparation of the plant damage mitigation plan according to Government Decree 90/2007 (26.IV.) are not available. Therefore, the submission of a remedial action plan and a self-monitoring plan is planned to be carried out by the Licensee as part of the authorisation procedure.

The location of the proposed monitoring points is described in chapter 2.10.

13. Data on provisioning for insurance claims and provisions

The obligations of the Licensee to provide financial security and environmental insurance are defined in the provisions of Government Decree 681/2023 (29.XII.). The same Decree states that there is no obligation to set aside provisions.

The amount of the financial security shall be determined on the basis of the calculation set out in Annex 1 to the Regulation, pursuant to point (1) of Article 3 of the Regulation.

$$B=A*K$$

Where

- B: the amount of the financial guarantee,
- A: the amount of the basic financial guarantee, which is HUF 1 000 000,
- K: the risk factor.

The risk factor is calculated according to the following formula:

$$K=(V_1*T_1)+(V_2*T_2)$$

Where

- K: the risk factor,
- V: the hazard factor,
- T: multiplier depending on the total amount of waste that can be collected at the site at any one time.

The method for determining the hazard factor V based on the type of waste to be included in the activity:

	A	B
1.	**Waste to be included in the activity nature of**	**Hazard factor (V)**
2.	non hazardous waste	$V=V_1$ value: 1
3.	hazardous waste	$V=V_2$ value: 10

How the multiplier T is determined, based on the amount of waste that can be collected at the same time on the site:

	A	B	
1.	**the quantity of waste that can be collected at the same time on the site (tons)**	**Non-dangerous T multiplier ($T=T_1$)**	**Dangerou s T multiplier ($T=T_2$)**
2.	0-0,9	1	1
3.	1-9,9	1,5	1,5
4.	10-99,9	2	2
5.	100-999	2,5	2,5
6.	1000-1999	3	3
7.	2000-2999	3,5	3,5
8.	3000-4999	4	4
9.	5000 tonnes or more	5	5

The value that can be calculated using the above relationship:

- $_{T1}$: 28,7 tonnes=>2
- $_{T2}$: 322.4 tonnes=> 2.5

$$B= A*((_{V1*T1})+(_{V2*T2}))=1\ 000\ 000*((1*2)+(10*2,5))=27\ 000\ 000 \text{ HUF}$$

The rate of the environmental insurance shall be determined in accordance with the calculation set out in Annex 2, pursuant to § 9, paragraph 2 of Government Decree No. 681/2023 (29.XII.), as follows.

$$B=A*V*T$$

Where

- B: minimum amount of environmental insurance per claim and per period,
- A: basic value, the amount of which is: ten million forints,
- V: hazard multiplier,
- T: territorial multiplier.

How the hazard multiplier V is determined based on the hazard classification of activities:

	A	B
1.	**For a waste management permit or registration tied activities**	**Hazard multiplier**
2.	Collection, transport and trade of non-hazardous waste, broadcast from	1
3.	Recovery, pre-treatment of non-hazardous waste	1,5
4.	Disposal of non-hazardous waste (landfills except)	2
5.	Collection, transport, trade and brokering of hazardous waste	3
6.	Hazardous waste recovery, pre-treatment	3,5
7.	Hazardous waste disposal (landfills except)	5

How the area multiplier T is determined:

- T=2; if the installation is to be operated in a protected natural area, a site of European Community importance for nature conservation (Natura 2000 site) not classified as a protected natural area or a water catchment protection area.
- T=1,5; if the installation is operated in the core area of a national ecological network or in the area of ecological corridors not defined in subsection 3.1.
- T=1; in all other cases.

The recovery and pre-treatment of hazardous waste is planned in the planning area. The facility will not affect protected areas, so the calculation is as follows:

$$B=A*V*T=10\ 000\ 000\ *3,5*1= 35\ 000\ 000$$

The relevant documents (insurance policy, and bank guarantee certificate) the documentation 1.19 are attached in annex.

14. Cross-border impacts

The project is unlikely to have cross-border effects.

15. Data and information covered by business confidentiality

Based on the decision of the investor, the entire documentation of the trunk can be posted, no information has been classified as a trade secret.

The manufacturer of the product did not contribute to the publication of the safety data sheet for the ingredient Silicone, which is therefore submitted as a separate document.

16. The process for preparing the environmental impact assessment

The subject of the environmental impact assessment and the documentation is the establishment, operation and remediation of the battery factory planned to be built by Eve Power Hungary Kft. in Debrecen, as well as the assessment of the impacts of possible accidental events. The purpose of the environmental impact assessment and the documentation is to assess and examine the environmental impact of the planned installation, to formulate proposals to minimise the adverse effects as far as possible and to identify the reasons why the installation may not be feasible from an environmental point of view.

In order to achieve these objectives, we have assessed the current environmental status of the project area, the environmental conditions the environmental impacts of the planned construction, their magnitude and consequences, based on the information published in the EIA and on site measurements. We examined the current and long-term (post-project) status of the individual environmental elements and environmental systems, delimited the area under investigation, and examined possible methods of protection separately for each area of expertise, and then summarised our findings in a summary assessment.

During the elaboration of the documentation, we carried out the assessment of the environmental impacts based on the data and information provided by the Investor and the Designers and Experts commissioned by the Investor.

In preparing the EIA, we have the current environmental legislation, but we have also looked into the planned amendment of the Decree 4/2011 (14.I.) of the Ministry of the Environment, which is currently only available as a draft legislation. The environmental impact assessment was prepared in accordance with the provisions of Act LIII of 1995 on the General Rules for the Protection of the Environment and Government Decree No. 314/2005 (XII.25.) on the Environmental Impact Assessment and the Uniform Environmental Use Procedure. The applicable legislation is described in each section.

The methods used in the impact assessment, their limitations and the circumstances of their application, the limits of validity (probability) of the predictions, and the gaps in scientific knowledge and uncertainties in the assessment of impacts and study results, where they exist, are described separately in each case.

16.1. Source of data used to prepare the EIA

In preparing the EIA, we have taken into account publicly available information (e.g. air pollution characteristics, traffic data, site protection characteristics), previous studies (e.g. soil mechanics and archaeological survey, and preliminary study for the North-West Economic Belt) and data from public authorities (summary of environmental impacts of developments in the wider area, and key data from hazardous plants in the vicinity of the site). In addition, field investigations were carried out to establish the environmental, noise and nature conservation status of the site and to establish the baseline condition of the site in terms of soil and groundwater.

The basic data taken into account in the development of the impact assessment, which determine the expected impacts of the construction and operation of the facility, were provided to us by the Permittee and the Designers and Experts commissioned by the Permittee.

16.2. The methods used, their limitations and conditions of application, the limits of validity (probability) of the predictions, difficulties and uncertainties encountered in the information needed to compile the study

In the course of the impact assessment and in the preparation of the documentation, the
we have carried out an assessment of the likely environmental impacts, taking into account legislation and standards.

The data provision, and thus the assessment of expected impacts, is sufficiently elaborate for the current level of planning, so minor changes in later stages of the planning cannot be excluded. Accordingly, the uncertainty of the data is in direct proportion to the current level of sophistication of the plans and the uncertainty of the calculation methods used in accordance with the legal and standard specifications.

In preparing the documentation, we also obtained data, images and information from public databases, and have marked these with all the appropriate figures.

16.3. List of studies used, how to access them

In preparing the documentation, the Licensee has provided us with the following studies:

- Preliminary soil survey and contamination analysis of the planning area (Fugro Consult Ltd: FCH-23159)
- Archaeological survey of the planning area (ERD I and ERD II, Hungarian National Museum)
- Detailed description of the proposed technology
- Architectural, fire protection, mechanical, utility, road and technological plans of the facility (TSPC Ltd.)
- Data on planned air quality and noise sources (TSPC Ltd.)
- Plans of the planned substation of the installation (WHB Ltd.)
- Impact assessment of cooling towers on the air environment (Enviro-Expert Ltd.)
- Safety data sheets for basic and excipients intended for use

The following studies were obtained from public sources and taken into account in the preparation of the documentation:

- The 5th National Environment Programme

- prepared by the Environmental Protection and Nature Conservation Department of the Hajdú-Bihar County Government Office
  "Air Quality Plan for the improvement of air pollution in the area of the Debrecen zone group"
- Preliminary examination DEBRECE NORTH-NYUGUGATIC ECONOMIC ZONE WITH TRANSPORT AND INFRASTRUCTURE
  To RESTRICT LEVAY, Béla Lévai, Environmental engineer, expert /Kamarai reg.:
  HBM MK 09-0036/. Documentation dated: Debrecen, 2018. 12. 02.
- FORM OF THE NATIONAL PUBLIC TRANSPORT SCHEDULE FOR 2022, Contracting Authority
  témaszáma:VB-2023/0083419/00
  Client's professional responsible: Lajos Janás, senior data base officer; Contractor: One Planet Mérnökiroda Kft.; Publisher responsible: Gergely Nitsch, okl. transport engineer, managing director; Source: https://internet.kozut.hu/kozerdeku-adatok/orszagos-kozuti-adatbank/forgalomszamlalas
- Regulatory Plan of the City of Debrecen; Source: https://debrecen-megyei-jogu-varos- szabalyozasi-terv.envimap.hu/
- Zoltán Dövényi (ed.): Cadastre of the small lakes of Hungary, Institute of Geography, Hungarian Academy of Sciences,
  Budapest, 2010
- MFO LRK Data Centre: 2018 summary assessment of air quality in Hungary based on automatic monitoring network data (National Meteorological Service), 2019; Source: https://legszennyezettseg.met.hu/storage/media/ertekelesek/2018_automata_ertekeles.pdf
- MFO LRK Data Centre: 2019 summary assessment of air quality in Hungary based on automatic monitoring network data (National Meteorological Service), 2020; Source: https://legszennyezettseg.met.hu/storage/media/ertekelesek/2019_automata_ert.pdf
- MFO LRK Data Centre: 2020 summary assessment of air quality in Hungary based on automatic monitoring network data (National Meteorological Service), 2021; Source: https://legszennyezettseg.met.hu/storage/media/ertekelesek/2020_ertekeles_automata.pdf
- MFO LRK Data Centre: 2021 summary assessment of air quality in Hungary based on automatic monitoring network data (National Meteorological Service), 2022; Source: https://legszennyezettseg.met.hu/storage/media/ertekelesek/2021_automata%20ertekeles.pdf
- MFO LRK Data Centre: 2022 summary assessment of air quality in Hungary based on automatic monitoring network data (National Meteorological Service), 2023; Source: https://legszennyezettseg.met.hu/storage/media/ertekelesek/2022%20automata.pdf

17. Rights to the protection of intellectual works

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18. Indication of the main alternatives previously considered by the user of the environment and the main reasons for choosing between these alternatives, taking into account the environmental impacts

Other variations to the location of the planning area could not be developed given the decisions taken at an early stage of project planning.

For the technological elements planned to be installed on site, the following were discarded at an early stage of the design phase, typically due to logistical, financial, environmental and scheduling considerations:

- Battery component manufacturing unit
- NMP distillation equipment.

Given that decisions on the above units were taken at an early stage of the planning process, it was not possible to assess the environmental impacts. In addition, as they would have had additional emissions from noise, air quality, water and waste management perspectives, no overall positive environmental impact can be assumed for these project elements. It should be noted, however, that the installation of the NMP distillation unit would have reduced the amount of traffic and waste generated, but that the scale of the additional environmental impacts arising locally from the operation of the system would also be non-negligible.

Furthermore, it was clarified with the local authorities at an early stage of the planning process that the NMP and electrolyte tank farms should be located in a building to minimise environmental risks. In the latter case, this option was also preferred by both the Licensee and the Designer, taking into account energy efficiency aspects. Given that the building design provides additional environmental safety, no additional environmental impacts were justified or meaningful for open area tank farms.

For the cooling towers, the noise studies proposed the use of a noise attenuated version, which was approved by the Permittee during the design phase. Given the more environmentally positive situation with noise attenuation, the situation without noise attenuation has not been further investigated in detail.

For cooling towers, grey water-only operation was considered in the design to minimise the use of potable water quality. However, the need for pre-treatment and purification of grey water prior to use in the cooling towers was investigated. In the light of the results of the calculations, and in the interests of safety, the Licensee decided to install a pre-treatment system. In view of the fact that the previous calculation results took into account higher pollutant concentrations, they are not presented in detail.

Overall, it can be concluded that the further design of the alternatives discarded in the earlier design phases would not have provided a better alternative from an environmental point of view than the plans presented in this document.