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# CORPORATE ESDD REPORT

## Mo-BRUK Group, Poland

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CLIENT  
Mo-BRUK S.A.

SUBJECT  
Corporate Environmental and Social Due  
Diligence

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## ESDD FINAL REPORT

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TITLE	Corporate ESDD final report	PROJECT DIRECTOR	Andrzej Krzyszczak
CLIENT	Mo-BRUK S.A.	PREPARED BY	Andrzej Andrusiewicz Małgorzata Bednarska Piotr Syrczyński
CONTACT	Wiktor Mokrzycki	MULTICONSULT POLSKA UNIT	Department of Technical & Environmental Consultancy

## SUMMARY

This Corporate ESDD Report provides an overview of our observations and comments regarding the environmental and social issues associated with Mo-BRUK Group operations. This report considers current environmental and social standing of the plants forming the Mo-BRUK Group based on information available during site visits and brief discussions with selected operational plants representatives.

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## TABLE OF CONTENTS

	<b>Chapter</b>	<b>Page</b>
<b>1</b>	<b>General Information</b>	<b>4</b>
1.1	General Introduction	4
1.2	Company operations	4
1.3	History of company development	6
1.4	Mo-BRUK Group management structure	7
1.5	Environmental and Health and Safety Management	7
1.6	Labour and Human Resources	8
1.7	Stakeholders engagement	8
<b>2</b>	<b>Environmental performance</b>	<b>9</b>
2.1	General observations	9
2.2	BAT Conclusions compliance	10
2.3	Investment plans	10
<b>3</b>	<b>Site visits</b>	<b>12</b>
3.1	Niecew	12
3.2	Wałbrzych	14
3.3	Skarbimierz	18
3.4	Karsy	20
3.5	Summary of the review	25

### Appendices

**Appendix 1** - Compliance with IFI's Performance Requirements

**Appendix 2** - Environmental and Social Action Plan

# 1 General Information

## 1.1 General Introduction

Multiconsult Polska sp z o.o has been appointed by Mo-BRUK S.A. to conduct a corporate environmental and social due diligence (ESDD) audit of Mo-BRUK Group operations in Poland in line with the International Financial Institutions (IFIs) standards.

According to the Terms of Reference, the audit objective was to critically review current environmental and social risks associated with Mo-BRUK Group operations and facilities as well as company management capacity to deal with the risks identified and future issues associated with applicable Polish and EU laws.

## 1.2 Company operations

Mo-Bruk SA is a Polish group operating in the recycling and recyclable material processing industry. Mo-BRUK S.A. (the "Group") is listed on Warsaw Stock Exchange.

The main activity of the Mo-BRUK S.A. Capital Group is waste management, including collection, recovery, recycling and utilization as well as production of alternative fuels (RDF) from combustible industrial and municipal waste. In addition, Mo-Bruk uses inorganic waste in the solidification process to produce cement granules that are a substitute for aggregate, and can be used as a road foundation, hydraulic backfill or reclamation material. Mo-Bruk has two incineration plants, where hazardous waste (including medical waste) can be incinerated. Mo-BRUK S.A. also deals with reuse of coal mud and the construction of concrete surfaces such as roads, squares, airport runways.

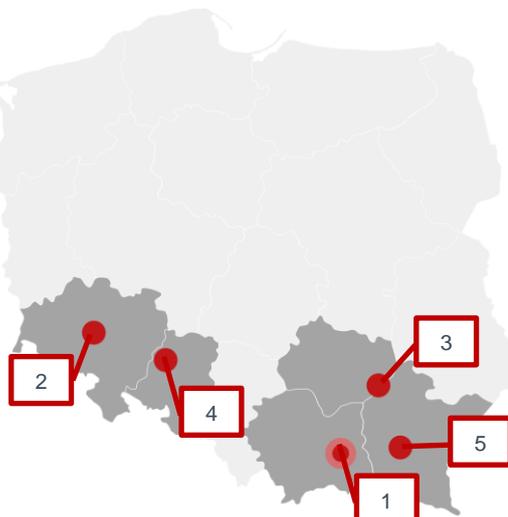
Mo-Bruk operates (location of the plants is presented in the schematic map below):

Headquarters: Waste recovery plant with concrete roads and runways plant, Niecew 68, 33-322 Korzenna near Nowy Sącz (1).

Divisions:

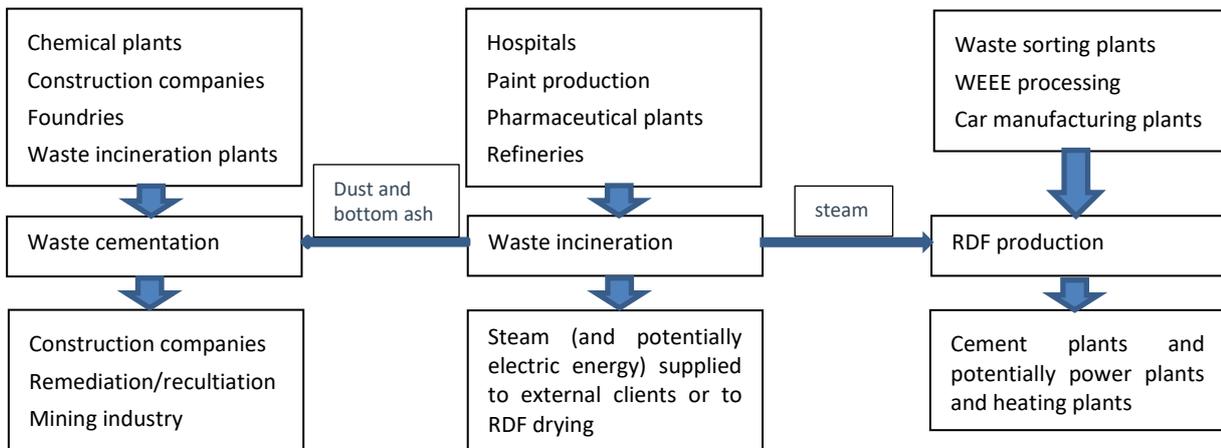
- Industrial waste landfill (under remediation), 1 Górnicza Street, Wałbrzych (2)
- Waste recycling plant (RDF production), 4 Górnicza Street, Wałbrzych (2)
- Alternative fuel production plant and incineration plant, Karsy 78, Ożarów (3)
- Waste solidification plant in Skarbimierz (4)

Daughter company RAF-Ekologia Sp. z o.o. – incineration plant at Jedlicze Refinery (5).



Mo-Bruk has recently sold a division involved in scrap iron and non-ferrous metals recycling in Zabrze.

The key elements of Mo-Bruk product chain is presented below



The main Mo-Bruk operations include acceptance of waste for processing and disposal. The company has technology, permits and experience in the disposal of almost the full range of waste types defined in the waste catalogue (Regulation of the Minister of the Environment of 9 December 2014 on the waste catalogue; Journal of Laws 2014, item 1923). Company installations can process 800 out of 920 waste types defined in the regulation.

Mo-Bruk deals only with industrial waste and is not involved in any municipal installations or waste collecting and sorting, although receives waste from municipal operators. Mo-Bruk clients comprise companies that possess waste, including production companies generating industrial waste as part of their activities, local government units obliged to collect waste from their area, municipal waste sorting plants, companies collecting small amounts of waste, waste brokers.

Each customer pays a fee depending on the type of waste and its physical and chemical parameters for the transfer of waste and its subsequent disposal. Subsequently, the Issuer processes the waste in such a way as to get best effects for the environment and benefits for itself:

- part of industrial waste, hazardous flammable waste, is incinerated in the Karsy incinerator, producing steam, which is used to dry the alternative fuel produced at the neighbouring line. Industrial waste and medical waste are also burned in the waste incineration plant by Raf-Ekologia Sp. z o.o., producing steam, which is sold to Rafineria Jedlicze (currently Orlen Południe S.A.);
- inorganic waste such as slag, dust from filters, waste from metal galvanization processes, acids, is subjected to the cementation process, as a result cement granulate is obtained which is a substitute for aggregate used in road construction and as a filler in reclamation works;
- combustible waste, including segregated municipal waste, is used for production of alternative fuel, which is sold for cement plants as a substitute for coal;
- iron and non-ferrous metal scrap separated from waste is sold separately.

Mo-Bruk owns Zakład Budowy Dróg i Nawierzchni Betonowych in Niecew (currently mothballed, but Mo-Bruk withdraws from this segment).

Additional activities include also operation of petrol stations, vehicle diagnostics station and a laboratory. Mo-Bruk owns two petrol stations in Niecew and in Łęka, where there is also a vehicle inspection and service station and a car wash.

Additionally, the Company has a laboratory within its structures, which carries out research and development works mostly for Mo-Bruk internal purposes. The laboratory has Polish Centre for Accreditation (PCA) certificate for chemical analysis of water, waste and wastewater and is also ISO 17025 certified.

In Wałbrzych, Mo-Bruk owns Coal Mud Recovery Plant with 4.4 million tonnes of coal sludge resources. Currently, there is no activity in this branch, and the Company is considering divesting this operations.

In Wałbrzych, in the period between 2002 and 2018, Mo-Bruk operated a landfill for non-hazardous waste and asbestos containing materials. At present, the landfill is closed and its rehabilitation is underway.

Mo-Bruk is active in liquidation of illegal waste warehouses (so-called “environmental bombs”), as it is able to utilize most types of waste.

### Processing volumes

Waste processing capacities of Mo-Bruk plants are presented in the table below

Plant	Operations	Processing capacity [tonnes/year]
Niecow	Waste solidification and stabilisation	Currently 100 000 Target 140 000
Skarbimierz	Waste solidification and stabilisation	Currently 70 000 target 140 000
Wałbrzych	RDF production	60 000
Karsy	RDF Production and incineration plant	200 000 25 000
Jedlicze	Hazardous waste incineration plant	10 000

Total waste processed by the Company (tonnes) were provided in the table below:

Segment	1 <sup>st</sup> half of 2020	1 <sup>st</sup> half of 2019	2019	2018	2017
Solidification and stabilisation	73 800	67 900	164 200	119 900	55 300
Alternative fuel production	23 000	41 000	78 800	89 400	80 900
Incineration	7 400	13 200	23 400	26 500	30 800

In 2019 the processing capacity for waste solidification and stabilisation was used in almost 70 % (164 201 tonnes processed, incineration plants were used in 67% of nominal capacity (23 420 tonnes processed) and the RDF production used only 30% of plants' capacity (ca. 78 800 tonnes processed).

The largest segment of Mo-Bruk operations is the solidification and stabilization of waste – revenue of PLN 52,1 million generated in 2019 (39.9% of the total revenue), followed by the incineration of industrial and medical waste - PLN 37,1 million (28.4% of the total revenue), RDF production is PLN 25.5 million in 2019 (19.5%). In 2019, other activities generated PLN 15.9 million (12%).

## 1.3 History of company development

Mo-Bruk operations began in 1985, when Józef Mokrzycki started his business. Until 1996, the operations were limited to production of terrazzo products (tiles, window sills, stairs), and the main customers of the products were individual customers. Since 1996, Mo-Bruk has been involved in industrial waste management. Following the development of the company, on 1 April 2008 the legal form of the company was transformed into a limited partnership. On June 1, 2010, the Company was transformed into a joint stock company.

The key dates of Mo-Bruk development are provided below:

- 1997 - launching the Waste Recovery Plant in Niecow, Korzenna Commune;
- 2002 - The company becomes the owner of the Industrial Waste Landfill in Wałbrzych;
- 2004 - opening a branch of the Company – Waste Recycling plant for hazardous and other than hazardous waste in Wałbrzych;
- 2007 - construction of another branch of the Company – RDF Production plant located in Karsy;
- December 2008 - acquisition from Rafineria Nafty Jedlicze S.A. and minority shareholders of 100% of shares in Raf-Ekologia Sp. z o.o. based in Jedlicze, which is an industrial waste incineration plant;
- August 19, 2010 - granting funding for R&D centre for pro-ecological waste processing technologies;

- January 5, 2011 - signing of an agreement for co-financing of development of Karsy Plant to increase the annual production capacity of the RDF from 100,000 tonnes to 200,000 tonnes of alternative fuels; the drying room and installation for the production of hot air designed as part of the project allowed for alternative fuels drying, which improved the quality of fuels delivered to customers;
- April 24, 2014 - completion of construction and commissioning of a hazardous waste incineration plant in Karsy;
- December 17, 2014 - the Patent Office granted a patent for an invention entitled "Synthetic aggregate production method". Based on the patented technology, the Company produces cement granulate using industrial waste in two of its plants: Zakład Odzysku Odpadów in Niecew (since 1997) and Zakład Odzysku Odpadów Nieorganicznych in Skarbimierz, which was commissioned in the second half of 2014;
- September 30, 2020 - sale of an organized part of the enterprise, i.e. the Iron and non-ferrous metals Recycling Plant in Zabrze.

## 1.4 Mo-BRUK Group management structure

Mo-Bruk is perceived as a family company, as majority of company shares remains in Mokrzycki family. Also the management team of the Group include members of the family:

Józef Mokrzycki - President of the Management Board

Elżbieta Mokrzycka - Vice-President of the Management Board for Administration

Anna Mokrzycka - Nowak - Vice-President of the Management Board for Research and Development

Wiktor Mokrzycki - Vice-President of the Management Board for Commercial Affairs

Tobiasz Mokrzycki - Vice-President of the Management Board for Construction

Environmental issues are managed at the corporate level by Mr Marek Górecki – chief of Environmental Department and supervised by Mrs. Anna Mokrzycka – Nowak. This organisation provides for central supervision and coordination of actions i.a. to obtain relevant environmental permits and consents as well as to ensure that appropriate contracts for utilities supply to the plants and waste management are in place.

The activities of the Group are subject to the environmental regulations applicable in Poland including Environmental Protection Law, Waste Management Act, Water Law and other executive orders, as well as relevant regulations of the European Union. The Group's plants are obliged to operate in line with integrated permits as well as sector permits, especially those regulating the management of waste.

The plants are subject to internal production control and audits concerning environmental, quality and health and safety issues.

## 1.5 Environmental and Health and Safety Management

Mo-Bruk Group has not implemented a formal environmental management system and has not established formal policies or procedures for environmental or occupational Health & Safety for all its plants and divisions. Only the plant in Niecew has obtained ISO 14001 certificate for production of aggregate. Mo-Bruk laboratory in Niecew is also certified for ISO 17025 standard. No certified management systems are implemented at other plants.

Operational environmental issues are managed by chief officers at the processing plants. It is their responsibility to deal with day-to-day documentation of waste transfers and utilisation.

Health and safety issues, as well as fire protection matters are subject to cooperation with external specialised companies. Since June 2020, Mo-Bruk cooperates with external Public Relations agency to enhance a positive Company image.

## 1.6 Labour and Human Resources

The key drivers for labour and HR management are the requirements of Polish regulations.

The recruitment process is conducted on the basis of the competence gaps in given areas. The Group hires employees based on employment contracts and civil law contracts. In the end of 2019, there were 260 employees working in the Capital Group based on employment contracts.

An important aspect of the organizational culture in the Group is the multi - generation and family nature of work. Employees share their experience with their families and friends, thus influencing the decision to work for the Group. This type of behaviour is associated with the tradition and history of the regions with which the plants' are located.

Moreover, managers of individual Plants are free to choose the tools that allow further building positive relationships with employees.

There are no trade unions in the Group and the workers organisation involves representatives of the employees consulted on various issues, inter alia concerning Health and Safety.

The Group has various forms of information and communication. Employees may submit motions or complaints in writing, by telephone, electronically or at face-to-face meetings. In addition, meetings are held where issues raised by employees are discussed.

## 1.7 Stakeholders engagement

The Group's approach to corporate social responsibility is expressed in building positive relationships with its stakeholders. Mo-Bruk has recently initiated cooperation with external public relations/investor relation agency and is currently considering presenting non-financial data in an Environmental, Social, Governance Report available to the public.

Mo-BRUK is aware that dialogue and cooperation with stakeholders of the Group is a fundamental practice of responsible business and plays a very important role in building Company value. Thanks to cooperation and communication with stakeholders, Mo-BRUK gains valuable knowledge on how to develop and improve Company organization and build its positive image.

Mo-BRUK cooperates with local communities. Recent activities include:

1. Mo-BRUK S.A. donated 22 computers to the Primary School in Korzenna. During the COVID-19 pandemic computers will be used for distance learning. Ultimately, the computers will be used in the computer lab.
2. Mo-BRUK regularly finances Nowy Sącz District Branch of Polish Red Cross. The PCK organizes first aid training for Mo-BRUK employees and provides guidebooks regarding the first aid.
3. Mo-BRUK supports sports clubs (football, kickboxing), promoting the activity of children and youth.

The main sources of communication with the Group's stakeholders include: company website at: [www.mobruk.pl](http://www.mobruk.pl). Investor relations publications, current and periodical reports are published on company webpage, investor presentations, and industry events.

## 2 Environmental performance

### 2.1 General observations

Mo-Bruk S.A. manages 5 waste treatment plants consisting of 8 installations operating on the basis of 5 integrated permits and 4 waste management permits. In addition, Mo-Bruk daughter company, Raf-Ekologia, industrial and medical waste incineration plant operating according to an integrated permit. Environmental aspects related to the operation of the installations are regulated in relevant decisions, and also result from the following key legal acts:

1. Act on waste dated December 14, 2012 (Journal of Laws of 2013, item 21, as amended).
2. The Environmental Protection Law Act dated April 27, 2001, (Journal of Laws of 2001, No. 62, item 627, as amended).
3. Act on the provision of information on the environment and its protection, public participation in environmental protection and on environmental impact assessments dated 3 October 2008 (Journal of Laws 2008, No. 199, item 1227, as amended).
4. Water Law dated 20 July 2017 - (Journal of Laws of 2017, item 1566, as amended).
5. Regulation of the Council of Ministers of September 10, 2019 on projects that may have a significant impact on the environment (Journal of Laws of 2019, item 1839).
6. Regulation of the Minister of the Environment of 27 August 2014 on the types of installations that may cause significant pollution of individual elements or the environment as a whole (Journal of Laws of 2014, item 1169).
7. Regulation of the Minister of Climate of 2 January 2020 on the waste catalogue (Journal of Laws 2020, item 10).
8. Regulation of the Minister of the Environment of August 29, 2019 on the visual inspection system for the waste storage or disposal place (Journal of Laws of 2019, item 1755).
9. Regulation of the Minister of the Interior and Administration of February 19, 2020 on fire protection requirements to be met by construction structures or their parts and other collection sites, storage or processing of waste (Journal of Laws 2020, item 296).
10. Regulation of the Minister of the Environment of February 7, 2019 on the amount of security rates for claims (Journal of Laws 2019, item 256).
11. Regulation of the Minister of Environment of 19 November 2008 on the types of measurement results carried out in connection with the operation of an installation or device and other data, as well as the terms and methods of their presentation (Journal of Laws 2008, No. 215 item 1366).
12. Ordinance of the Minister of Development of January 21, 2016 on the requirements for the thermal processing of waste and the methods of handling waste generated as a result of this process (Journal of Laws 2016, item 108).
13. Regulation of the Minister of the Environment of 11 May 2015 on waste recovery outside installations and devices (Journal of Laws of 2015, item 796).
14. Act of April 16, 2004 on construction materials (Journal of Laws of 2004, No. 92, item 881).
15. Regulation of the Minister of Infrastructure and Construction of 17 November 2016 on national technical assessments (Journal of Laws of 2016, item 1968).
16. Regulation of the Minister of Infrastructure and Construction of 17 November 2016 on the method of declaring the performance of construction products and marking them with a construction mark (Journal of Laws of 2016, item 1966).
17. Official Journal of the Commission Implementing Decision of 10 August 2018 establishing the best available techniques (BAT) conclusions for the waste treatment pursuant to Directive 2010/75/EU of the Parliament and of the Council.
18. Official Journal of the European Union of 12 November 2019 establishing the conclusions on the best available techniques (BAT) with regard to waste incineration under Directive 2010/75/EU of the European Parliament and of the Council.

Requirements of legal regulations are the key drivers for company actions towards improving environmental performance of the plants.

Technical issues are also subject to legal regulations including emissions to the environment - emission limits and the method of their monitoring and reporting. Mo-BRUK S.A. meets all current requirements and monitors changes and prepares for their implementation. This is further discussed in BAT compliance section.

## 2.2 BAT Conclusions compliance

All the Company installations were subject to verification of compliance with the requirements of applicable BAT Conclusions. The authorities requested the Company to present information concerning specific requirements of BAT Conclusions. Based on review of the replies to the authorities, there are several recommendations that will need to be addressed in the future, when the conclusions are the directly binding regulations.

1. Environmental Management System

Each plant will need to be covered by the Environmental Management System (EMS), addressing specific requirements for the waste treatment or waste incineration. It should be further confirmed, which elements of the EMS are applicable to Mo-Bruk plants, as not all issues are relevant to unique operations conducted at the plants.

2. Scope of emission monitoring

There are specific requirements in BAT Conclusions with respect to emission monitoring from the plants. It will be necessary to define the applicable set of parameters and the schedule of monitoring.

3. It will be also necessary to discuss with the authorities the applicability of some BAT requirements to the operations conducted at the plants.

In line with Mo-Bruk declaration, all installations will be fully aligned with the BAT Conclusions requirements by August 2022.

## 2.3 Investment plans

There is no specific document presenting separately environmental and social investment plans. The investments are planned taking into account current environmental requirements. At present Mo-Bruk is in the process of obtaining the environmental consent decision for the construction of storage sheds and noise barriers in Niecew.

The following investment plans regarding the future BAT Conclusion compliance have been presented to us following the site visits. It is worth noting that majority of the investments discussed have positive impact on energy consumption, or optimisation of processes resulting in energy efficiency improvements.

1. Niecew:

- BAT 23 - efficient energy consumption - energy audit with modernization - 150 000 PLN,

2. Karsy Incineration Plant:

- BAT 1 - development and implementation of an environmental management system – 20 000 PLN,
- BAT 11 - purchase of a Geiger counter - monitoring of waste deliveries for waste radioactivity – 4 000 PLN,
- BAT 20 - adaptation of the installation (...) to ensure the efficiency of the boiler at the required level - at least 60% - 300 000 PLN,

3. Karsy – RDF installation (new and old line):

- BAT 23 - efficient energy consumption - energy audit with modernization - 150 000 PLN (new line),
- BAT 23 - efficient energy consumption - energy audit with modernization - 150 000 PLN (old line),

4. Skarbimierz – solidification and stabilisation plant

- purchase and installation of fabric filters on exhaust fans (emission reduction) – 60 000 PLN,
- purchase and installation of measuring positions for emissions from fans – 2 000 PLN,

5. Wałbrzych – recycling plant (RDF production)

- BAT 23 - efficient energy consumption - energy audit with modernization - 150 000 PLN,
- BAT 1 - development and implementation of an environmental management system – 20 000 PLN,

Future investments needs will depend on the interpretation of BAT Conclusions requirements by local administration. The investment plans will need to take account of the possible changes in legislation and adapt the operations to new obligations.

## 3 Site visits

As part of the Corporate ESDD audit, we have visited the Niecew Plant, including Company Headquarters, aggregate production, and laboratory; landfill site and the RDF production plant in Wałbrzych; waste solidification and stabilisation plant in Skarbimierz. We have also participated in virtual tour around Karsy Plant.

Based on site visit observations, we were able to conclude on general environmental and social as well as Health and Safety management in the Group.

### 3.1 Niecew

Waste Recycling Plant located at 33-322 Korzenna, Niecew 68. The area of plant includes plots: 7/1, 7/2, 7/3, 7/4, 7/5, 7/6. The plant was classified (in line with the regulations) as installation for:

- recovery or neutralization of hazardous waste with the processing capacity of more than 10 tons per day using physico-chemical treatment
- recovery or disposal of hazardous waste with a processing capacity of more than 75 tons per day using the treatment of slag and ash
- storage of hazardous waste pending subsequent operations with a total capacity of more than 50 tons, excluding preliminary storage of waste by the waste producer at the production site.

According to the presented documents, the highest production capacity allowed by the integrated permit (change of the permit dated 2019) for the two production lines making up the installation as a whole is 100 000 tonnes / year, including hazardous waste 32,550 tonnes / year, and slags and ashes constituting non-hazardous waste 61,000 tonnes / year.

#### Formal and legal situation

The plant has a regulated formal and legal situation. Obligations in the field of environmental protection are regulated by the following decisions:

- Decision of 14.07.2014, Ref. No. : SR-II-1.7222.1.1.2014 issued by the Marshal of the Małopolskie Voivodeship - Integrated permit for hazardous and non-hazardous waste recovery installations in Niecew 68, commune Korzenna with subsequent changes:
- the decision of 04/08/2014, Ref. No. SR-II-1.7222.1.1.2014 issued by the Marshal of the Małopolska Province on the correction of an obvious error in the integrated permit)
- Decision of December 3, 2014, Ref. No. SR-II-1.7222.2.6.2014 issued by the Marshal of the Małopolskie Voivodeship, amending the integrated permit
- Decision of June 25, 2019, SR-II.7222.1.5.2018 issued by the Marshal of the Małopolskie Voivodeship, amending the integrated permit
- Permit for waste collection, decision on May 6, 2015. ORL-I.6233.32.2014 issued by the Starost of Nowosądecki
- Permit to operate in the field of hazardous waste recovery outside installations and devices decision 27/05/2015 ORL.I.6233.36.2014 issued by the Starost of Nowosądecki
- Water permit of 08.10.2018 KR.RUZ.4211.28.2018.BS issued by PGW Woda Polskie Director of the Regional Water Management Board in Krakow for the discharge of treated wastewater into the Jasienianka stream (outlet 1), valid until 04/10/2022
- Water permit of November 6, 2018 KR.ZUZ.3.421.642.2018.ES issued by PGW Woda Polskie Director of the RZGW in Krakow for the discharge of rainwater and meltwater through the existing outlet (outlet 2), valid until October 31, 2038
- Water law permit of October 25, 2010 SW.V.2.MM.6214 / 1-20 / 10 issued by the Marshal of the Małopolskie Voivodeship for the introduction of plots of land no. 1, 7/2 and 8 into the stream without the name of rainwater and snowmelt / 2 valid until October 25, 2020 (new survey in preparation)
- Water permit of 27.01.2010 ORL.II.6223-35 / 09 issued by the Starost of Nowosądecki for the uptake of groundwater from the R-1 well, plot 6/3, valid until 31.01.2030

On March 6, 2020, the plant received a letter from the Commander of the Municipal Fire Service in Nowy Sącz regarding the submitted fire report, in which the Commander decided that due to the fact that only non-flammable waste is stored on the site, the conditions for waste management in the Plant in Niecew are not subject to consultations with the fire brigade.

### **The plant operations**

Zakład Odzysku Odpadów conducts activities aimed at processing waste consisting in treating it in the process of stabilization and solidification with the use of binding materials such as lime and cement to produce artificial aggregate. The R5 (Recycling or recovery of other inorganic materials) process is carried out to produce concrete mass and finally cement granulate. The processed and stored inorganic solid waste largely consists of silica, oxides and hydroxides of metals such as iron, hydroxides of chromium, copper, nickel, carbonate, bicarbonate, sulphate and other forms of metals. Waste is delivered to the plant by external or own transport.

In addition, the plant collects waste, which is transferred for management in other Mo-BRUK S.A. plants or external entities holding relevant decisions in this regard.

According to the adopted rules, the first stage of the process is to verify the composition and properties of each waste. Based on this knowledge, a decision is made to accept the waste, and then a recipe for further processing is developed by the chief technologist.

The plant is not a source of organized emissions (apart from the emissions from silos), nor technological sewage. Storage silos are equipped with fabric filters with high efficiency.

As part of the activity, industrial wastewater, i.e. leachate from waste storage sites, part of the leachate is directed to the reservoir and used for production purposes. The remaining part, together with rainwater, is directed to the Jasienianka stream after pre-treatment in the oil separator, sand trap and then on a chelating resin to trap heavy metals. The discharge of wastewater is regulated by the water permit. The amount of wastewater discharged into the stream is measured.

The plant takes water from the Jasienianka stream in line with the conditions set out in the integrated permit.

Water for sanitary purposes is abstracted from the on-site well. The plant does not use external water network.

The plant operates in a two-shift system, the plant area is fenced and monitored.

The installation includes production and storage halls, sheds, workshop building, concrete squares and internal roads, two technological lines consisting of technological devices, including: mixers / agitators, conveyors, feeders, sifter, crushers, silos for dusty waste and cement. In addition, there are forklifts, loaders, excavators and a dump truck used for internal transport of waste, raw materials and product at the plant.

Waste processing at the plant is carried out according to the technology that includes the following processes:

- acceptance and storage of hazardous and non-hazardous waste,
- shredding, screening, waste separation,
- laboratory test to determine the chemical composition of waste, including heavy metals and chloride and sulphate anions,
- developing a processing recipe or using the existing one, taking into account the physicochemical composition,
- composing the waste mass with the use of chemical additives, reducing pollution in solid or liquid waste
- solidification with a hydraulic binder.

A fire safety instruction for the plant was prepared, it is updated on an ongoing basis, and employees are regularly trained in the field of health and safety and fire protection.

According to the presented fire protection report the maximum weight of each type of waste that can be stored at the same time is 1,600 tonnes for hazardous waste, 1,200 tonnes for non-hazardous waste. The largest volume of waste that could be stored at the same time in the installation is 2,800 tonnes.

The waste generated in connection with the operation of the installation is first transferred to subsequent technological processes in other plants of the Company or, if this is not possible, it is transferred to entities authorized to manage waste on the basis of the Waste Transfer Card.

### Conclusions from the site inspection

The technical condition of the installation is assessed as good and no issues are expected in terms of operation and environmental protection. The company has a management system compliant with ISO 9001 and 14001, which covers broadly understood safety issues (occupational health and safety, fire protection, environmental protection, process safety).

According to the information presented during the visit, order for waste acceptance is preceded by comprehensive tests in the Company's laboratory. Based on the results obtained, a decision is made whether the waste will be cemented, incinerated or sent to the production of alternative fuel. If the tests show that none of the above methods is possible, the waste deliveries are not contracted. The company has a certified laboratory since 2011. by PCA (AB1267 accreditation valid until 2023). During the on-site visit, modern laboratory equipment was presented, enabling the provision of services also to external contractors. The laboratory conducts chemical analysis, physical properties tests and has an accredited sampling. The scope of the laboratory's work includes tests of construction products, building materials, buildings, environmental tests of air, water, soil, waste, sediments and sewage, as well as tests of fuels and lubricants.

According to the information provided by the representative of the Company, the Company currently conducts extensive activities for local administration and Environmental Inspectorate (WIOŚ) related to the liquidation of ecological bombs, i.e. places where waste has been stored and abandoned. After taking over this waste, it is transferred, depending on its nature and properties, to one of the installations operating within the Company.

Waste storage places are equipped with video surveillance.

Currently, the Company plans to construct a roof over the storage yard to comply with future requirements for the waste storage. It is planned that the water from the roof will be discharged into the stream with a separate sewage system and a separate outlet. The analysis of documentation, as well as the inspection carried out on waste management and the method of waste storage, do not raise any doubts as to the fulfilment of the fire protection requirements.

According to the information provided, the acceptance of waste takes place on the basis of the waste transfer note. Each delivery is weighed on the gate and subjected to visual inspection and tests for compliance of the waste characteristics with the actual state.

Due to the fact that on the premises of the Plant there is conducted activity in the field of waste storage, it is advisable to supplement the integrated permit with the R13 process.

Warehouse and manoeuvring yards are hard surfaced. And all the paved area is drained to wastewater system.

Finished products are seasoned and stored in the second part of the Plant, on an unpaved and uncovered area. This material has the necessary technical approvals and is treated as construction material (not waste). During the visit, it was observed that during dry periods, fugitive emissions from the storage areas towards could pose a nuisance to residential areas neighbouring the plant. It is advisable to limit this emission.

The planned investment consisting in building a roof over the storage yard is an investment justified by legal changes - the ordinance of the Minister of Climate of September 11, 2020 on detailed requirements for the storage of waste. The investment will contribute to reducing the impact of weather conditions on waste and will reduce the amount of industrial wastewater from storage sites.

Based on observations made during site inspection, it can be concluded that both the facilities and installations are in good technical condition.

## 3.2 Wałbrzych

### Formal and legal issues

Wałbrzych plant has decisions allowing it to operate in the field of processing hazardous and non-hazardous waste.

Integrated permit issued by the Lower Silesian Voivode on 27.07.2007 SR.IV.6619 / W63 / 5/06/07 to operate installations located in Wałbrzych at ul. Górnicza 1 and 4, the decision covers the landfill of non-hazardous and inert waste and the Waste Recycling Plant. The permit is issued for an indefinite period. This decision was changed several times:

- by decision dated March 31, 2008, DM-Ś / MKr / 7660-47 / 47-III / 08, issued by the Marshal of the Lower Silesia Province, transferring the rights and obligations of the above-mentioned permits for the company "Mo-BRUK" J. Mokrzycki Sp.k.,
- decision on June 11, 2010 DM-S.V.7650-2060 / 06/10 issued by the Marshal of the Lower Silesian Voivodeship
- decision of 15/09/2016 DOW-S-V.7222.78.2014.AP.MC issued by the Marshal of the Lower Silesian Voivodeship
- by decision of August 16, 2018, DZŚ-III.281.106.2018 / MT issued by the Minister of the Environment
- decision of August 16, 2018, DZŚ-III.281.105.2018 / MT issued by the Minister of the Environment

The plant has the Resolution No. 16/2020 of February 18, 2020. , MZ.5560.11.MK City Commander of the State Fire Service in Wałbrzych, agreeing on the conditions of fire protection

On September 23, 2016, the Marshal of the Lower Silesia Voivodeship issued a decision to withdraw the decision of the Lower Silesian Voivode of July 27, 2007 granting an integrated permit to operate the installation. The decision of the Marshal of the Lower Silesia Voivodeship was appealed to the Minister of the Environment, who, by decision of April 19, 2017, upheld the contested decision. On May 24, 2017, a complaint was filed against the decision of the Minister of the Environment of April 19, 2017, along with a motion to suspend enforcement. On November 17, 2017, the Voivodeship Administrative Court in Warsaw revoked the contested decision. On January 26, 2018, a cassation appeal was sent. The ruling of the Provincial Administrative Court was favourable for Mo-BRUK S.A., however, a cassation appeal was filed against the justification in order to obtain more favourable guidelines. A cassation appeal was also filed by the Minister of the Environment. By a decision of March 19, 2018, the Provincial Administrative Court rejected the cassation appeal due to failure to remedy the formal deficiencies, and a complaint was filed against this decision, possibly with a request to restore the deadline. On November 20, 2018, the Supreme Administrative Court in Warsaw quashed the appealed decision rejecting the cassation appeal. By a decision of November 20, 2018, the Supreme Administrative Court discontinued the appeal proceedings regarding the rejection of the application for restoration of the deadline. The hearing before the Supreme Administrative Court was held on July 2, 2019, and the court dismissed the cassation appeals by the judgment issued in the case. Thus, the above-mentioned the judgment of the Provincial Administrative Court in Warsaw has become final. The case returned to the Minister responsible for the environment - Minister of Climate, who, by decision of 19/05/2020, repealed the contested decision in the part concerning the wording of its resolution and in this respect gave the contested decision a new wording, and in the remaining part upheld the above decision of the Marshal of the Lower Silesian Voivodeship. From the decision of the Minister of Environment, an application was submitted to the Provincial Administrative Court to suspend the enforceability of the decision of the Minister of the Environment and a complaint against the above decisions. By the decision of August 26, 2020, the Provincial Administrative Court suspended the execution of the appealed decision of the Minister of Climate. The complaint against the decision of the Minister of Climate is pending before the Provincial Administrative Court in Warsaw.

Despite the above-mentioned disputes, the Company operates on the basis of the integrated permit from 2007 as amended and, in accordance with the requirements of the law, submits to the Marshal the necessary documents regarding the fulfilment of the requirements for waste storage and the conditions of the BAT conclusions. On December 10, 2018, the Company sent the with regard to the waste processing activity conducted in the RDF waste processing plant. Then, on February 14, 2019, the Marshal called on the Company to submit an application for changing the integrated permit in terms of meeting the BAT conclusions by February 19, 2020 and adapting the installation to the requirements of the conclusions by August 17, 2022.

Currently, since February, the authority (Marshal of the Lower Silesia Voivodeship) is processing a permit amendment to adapt the installation to BAT requirements in accordance with the Commission Implementing Decision (EU) 2018/1147 of August 10, 2018 establishing conclusions on the best available techniques (BAT) with regard to waste processing and the requirements of the Act amending the Waste Law of 2018 in the field of fire protection, the amount of security for claims related to irregularities in waste management and waste storage. Due to the situation related to the pending court cases and the pandemic situation, the procedure is prolonged.

At the same time, the authority (Polish Waters) has a water permit for the discharge of rainwater from the plant.

In terms of fire safety, the Company has a Fire Safety Manual

### **Plant operations**

The plant is located in the southern part of Wałbrzych, in the Podgórze district, in the industrial area of former Wałbrzych hard coal mine. The plant operates waste processing using the following methods:

R3 - Recycling or recovery of organic substances which are not used as solvents (including composting and other biological transformation processes)

Or R5 - Recycling or recovery of other inorganic materials

R12 - Exchange the waste for any of the processes listed in R1 to R11

This activity is related to:

- landfill reclamation: construction of an insulation layer in the landfill, construction of temporary access roads to the landfill, construction of slopes, embankments, shaping the top of the landfill
- production of alternative fuel RDF

A landfill for non-hazardous and inert waste with a separate area for storing hazardous waste was intended for industrial waste. The landfill was built within an artificially created hollow in the place of a closed coal sludge pond. The landfill is divided into four plots, of which plot no. I is designated for the landfilling of asbestos-containing waste. Waste other than hazardous was stored in chambers no: I, III, IV. The total area of the landfill is 8,13 ha. The landfill substrate was sealed with coal sludge accumulated in the sedimentation tank. A drainage system to collect leachate has been laid on the sealed surface. Drainage water and leachate are discharged outside the landfill into a septic tank. The leachate from the septic tank is transported by a tanker to the industrial sewage treatment plant in Świdnica.

Currently, since March 2019 the landfill is closed and does not accept waste. The landfill has reached its target height. Currently, for the purposes of reclamation, inert waste is accepted and used, which improves the stability of slopes and the canopy and improves soil conditions, i.e. construction waste, slag, ashes, sewage sludge, used tires. According to the decision, other waste may be used as well, provided that it is inert waste

According to the information provided, the plot No. I has already been reclaimed and will be covered with grass by the end of the year. For plots no. II, III and IV The rehabilitation of the asbestos section will be completed by 2023.

There are 7 piezometers around the landfill, one for monitoring of groundwater upstream and 6 downstream the landfill. According to the information provided, no exceedances of parameters in groundwater have been recorded.

Zakład Recyklingu Odpadów is located in the immediate vicinity of a waste landfill, in a building of a former locomotive shed.

The Waste Recycling Plant is located in a 550 m<sup>2</sup> hall. There are the following facilities at the plant:

- main hall with equipment for the production of alternative fuel
- side hall,
- break rooms and an office,
- storage rooms,
- electric boiler room.

The plant is equipped with:

- a truck scale with a load capacity of up to 45 tons,
- modern fire protection, fire tanks, hydrant,
- leachate tank with a capacity of 32.1 m<sup>3</sup>,
- technological wastewater tank with a capacity of 12 m<sup>3</sup>,
- internal roads and squares,
- fencing, lighting the area around the facilities,
- rainwater sewage system at the building of Zakład Recyklingu Odpadów with an soak-away well.

Waste recovery is carried out at the Waste Recycling Plant and consists in the production of solid fuel, the so-called Refuse Derived Fuel. RDF is a waste marked with the code 19 12 10 or 19 12 11\*.

The products of the Waste Recycling Plant may be incinerated in cement plants and thermal power plants or power plants with appropriate permits for the recovery of the waste in question in the R1 process (use as fuel for energy production) or D10 (thermal waste treatment in installations or devices located onshore). The installation works, in two

shifts. The products are tested for calorific value, ash content and other basic components, in accordance with the requirements of the Polish Standard and the industry requirements of the cement industry.

In the past, the plant produced RDF with the addition of liquid waste, such as paints or oils. For the storage of these liquid substances, an underground double-skinned tank, equipped with a leak detector and an alarm. Currently, the tank is no longer used. Liquid waste was also stored in sealed containers, "mauser" tanks and barrels. In the past, the plant also processed waste into cement granulate called Mo-Bruk, which had the technical approval of the Institute of Roads and Bridges, and alternative fuel under the trade name of Bruk-eko. This activity is discontinued.

The waste processing capacity of Zakład Recyklingu Odpadów amounts to approx. 120 thousand. tonnes / year.

The collected waste is stored at the landfill and the Waste Recycling Plant to which Mo-Bruk has a legal title (plots 26/31, 26/32, 26/37, 26/1, 26/38)

Mo-Bruk possess also a permit to collect and transport waste. Waste that is not covered by this permit for recovery or disposal is transferred to a specialized company having an appropriate permit for its further processing. The main plants collecting this waste are other departments of the Company

Waste deliveries are carried out in accordance with the internal procedure. Each delivery is approved in accordance with the offer and prior notification. Each delivery is pre-weighed and controlled for compliance with the Waste Transfer Note, after full visual compliance and shipping documents are confirmed, the card is approved in the BDO electronic system.

The premises of the plant and the storage yard are under supervision control. The area is partially fenced, and partially inaccessible due to terrain barriers. The waste storage area is video monitored in accordance with the legal requirements.

Currently, the plant accepts about 6 cars a day, in the past there were about 50. Reducing the plant's capacity limited the number of deliveries and the noise nuisance for neighbours.

Currently, the plant mainly processes plastic packaging waste and end-of-life railway sleepers. The main supplier is the Polish railway company PKP PLK - the main operator of railway lines.

The main recipients of alternative fuel are plants from Germany and cement plants in Poland

During the site inspection, it was found that the site of the Plant is unpaved and that it is muddy during heavy rainfall. The condition of the surface requires hardening in the area of roads and manoeuvring yards, but also in operational places where waste is stored.

Hazardous waste, i.e. railway sleepers, is stored in an area that does not have a leakproof, hardened surface. According to the information, the paved area is covered with a layer of crushed stone, without a geomembrane. It is necessary to adjust the places so that the underlying ground is sealed and impermeable. In addition, the prepared RDF is distributed throughout the entire area around the warehouse / shed. The hall for RDF storage does not provide sufficient protection for the environment against wind-blown spreading of shredded waste (RDF). It should be noted that the current method of storing the waste accepted for processing and the waste generated as a result of processing does not guarantee protection against the influence of weather conditions or against the contamination of the soil and groundwater. Therefore, it is recommended to upgrade the storage areas to comply with the requirements concerning waste management, and the provisions of the new Regulation of the Minister of Climate of September 11, 2020 on detailed requirements for the storage of waste. Pursuant to the ordinance, the Company has 48 months to adapt the storage areas to the new regulations, and the Company has already commenced the works on roads hard-surfacing. The works should be completed within the next 3 months and the cost of modernisation was estimated at 150 000 PLN.

In our opinion, the Company should include in the integrated permit the R13 process - Waste storage prior to any of the processes listed in items R1 – R12 (except for initial storage at the waste producer). This remark is mainly related to the fact that the waste accepted for the process is stored in the area to which the holder has legal title and the waste generated as alternative fuel is also stored on the Company's premises before being transferred to further processes. Moreover, the Company has a permit to collect waste that is not processed on site in Wałbrzych, but is transferred to other branches of the Company.

### 3.3 Skarbimierz

The plant is located at 21 Smaków Street in Skarbimierz, on plot no. 92/32, Skarbimierz Osiedle district, in the industrial zone, away from housing estates. The present industrial zone is located in the former Soviet Army airport. The plant was commissioned on July 15, 2014.

The formal and legal status of the Installation

The plant has a regulated formal and legal situation, has the following decisions regulating waste management:

- Decision of 04/09/2014, DOŚ.7222.14.2014.Tł issued by the Marshal of the Opolskie Voivodeship Integrated permit for the installation of recovery or disposal of hazardous and non-hazardous waste in Skarbimierz with subsequent amendments;
- Decision of 03/12/2014, DOŚ.7222.14.2014.Tł issued by the Marshal of the Opolskie Voivodeship on the ex officio correction of a mistake in the decision issued
- Decision of March 24, 2015, DOŚ.7222.133.2014.JZ issued by the Marshal of the Opolskie Voivodeship, changing the permit integrated ex officio,
- Decision of 29/09/2016, DOŚ-III.7222.11.2016.MK issued by the Marshal of the Opolskie Voivodeship, changing the integrated permit
- Decision of 18.01.2018, DOŚ-III.7222.61.2017.MSu issued by the Marshal of the Opolskie Voivodeship, changing the integrated permit

On March 5, 2020, the company obtained the decision of PZ.5585.13.2020 of the Commander of the County State Fire Service in Brzeg, approving that the plant meets the fire conditions required for waste storage.

In February 2020, an application amending the integrated permit in connection with legal changes in the field of fire protection and BAT requirements was submitted to the Marshal's Office. According to the information provided by the representative of the Plant, as part of this application, the Plant wants to double the annual volumes of waste processed. The process of changing the permit is still pending due to the epidemiological situation.

#### Plant operations

The installation carries out the process of waste recovery R5 - Recycling or recovery of other inorganic materials, as a result of which the final product - aggregate is produced. If the product does not meet the quality requirements for its future use, the waste treatment process in the installation itself is classified as a waste disposal process. D9- physico-chemical treatment, not included in another entry, resulting in the formation of final compounds or mixtures treated with by any of the processes listed in items D1-D12 (e.g. evaporation, drying, calcination, etc.), and the product that does not meet the quality requirements will be waste with the code 19 03 05 and / or 19 03 07,

The installation is intended for recovery or disposal, with the exception of storage, of hazardous and non-hazardous waste, with a processing capacity of over 191 tons per day. The plant mainly uses inorganic waste. The production activity carried out within the installation consists in the recovery and neutralization of hazardous and non-hazardous waste through their appropriate solidification and binding of hazardous substances so that they are not washed away. The waste is processed into cement granules meeting the requirements of the technical approval for Mo BRUK cement granules.

The IPPC installation includes:

- mobile screen
- mobile jaw crusher
- mixer
- loading hopper
- centrifuge with accessories
- extruder
- silo with a screw conveyor - 4 pcs.
- stirrer with mixers.

Other installations include:

- chargers - 2 pcs.
- laboratory research equipment
- car scale
- forklifts.

Loose waste is stored in air-tight boxes or silos, while liquid and semi-liquid waste can be stored in a bunker or a tank. Part of the waste is also stored in Mauser containers in the underground warehouse.

The waste is brought to the plant by road transport. Then, after their verification and weighing on a truck scale, they are stored selectively in roofed storage boxes or in silos equipped with bag filters with high dust removal efficiency and a capacity of 150 tonnes each. Waste is stored selectively, depending on its morphology. For each batch of waste, based on laboratory results, a recipe for a separate physicochemical treatment method is developed. The main technologist is responsible for the preparation of recipes. The total amount of waste planned for recovery and neutralization in the installation is 70 thousand tonnes / year. The maximum amount of each waste may not exceed 40,000 tonnes / year. According to the decision, the D9 process may generate up to 30,000 tonnes / year of 19,0305 and / or 190307 waste, i.e. granulate that does not meet the requirements of the National Technical Assessment.

The first step in the process is the verification of the waste batch. For this purpose, laboratory tests are performed in the accredited laboratory of the Company. This is the stage preceding the acceptance of the first batch of waste. Thorough examination of the waste before signing the contract allows for the appropriate development of the technology for their treatment.

The technological process of granulate production takes place in several stages:

- acceptance of waste - weighing of waste on a truck scale, checking compliance of the delivered waste with the waste transfer card
- sending waste to the appropriate warehouse - hazardous waste is stored selectively
- based on previous data on the physicochemical composition of the delivered waste, they are crushed, separated (solid waste, liquid waste), sieved or centrifuged, depending on the needs
- the waste was loaded with a wheel loader to the loading bin of the main installation
- neutralization to eliminate hazardous substances
- mixing and shaping of the mass, sending via a conveyor belt to the hall
- care
- analysis of the produced granulate
- crushing and fractionation into the desired fractions.

After the stabilization process is completed, mineral fillers, pozzolanic additives and cement may be added to form the final post-reaction mass.

The main process takes place with full air-tight sealing of the installation in the production hall.

Waste intended for the production of Mo BRUK cement granulate is stored in closed facilities, in tanks, boxes or silos. Liquid waste (sludge) in the hangar, equipped with a reinforced concrete tank in the floor, intended for any leachate that may arise as a result of unsealing the container.

The product is stored on a paved area or under a shelter.

The plant employs 16 people and works in one shift mode from 7-15.

Each accepted waste transport is inspected and samples are taken to verify compliance with the waste specification. The plant has a laboratory and modern XRF detection equipment - X-ray analyser, which allows for quick examination of chlorides, sulphates and heavy metals.

Leachate analysis with strip tests are also performed on site. This control allows achieving a safe, finished product that meets the requirements of the National Technical Assessment.

## Summary

The plant is a modern facility, all installations and the plant area are in very good technical condition. The area is almost entirely paved. Waste storage places are protected against the influence of weather conditions, waste is stored taking into account its composition and form so that it does not mix before processing. The finished product, which does not exhibit hazardous properties (which does not leach substances posing a threat to the environment), is stored in a hard surfaced area. Waste from D9 processes, i.e. a product that does not meet the accreditation requirements, is stored in the hall.

During the audit, no irregularities were found that could pose a risk to the operation of the Plant.

On the other hand, in our opinion, the plans to double the amount of accepted waste, may result in a potential issue with proper storage of waste. The hall intended for the storage of waste is relatively small as for the plans related to increasing the capacity of the installation.

The storage capacity has been additionally limited by Polish regulations, as it is allowed to use only half of the actual storage capacity.

Moreover, it has been observed that the trucks manoeuvring inside the hall do not have a growing space. Such a situation may potentially cause a collision. This can be a problem when increasing the capacity of the plant, especially as the site is not prepared to accommodate more cars at once. Similarly, there may be a problem with possible increased traffic on the premises of the Plant. The increase in the number of cars will result in limitation of the manoeuvring area inside the Plant and on the street leading to the Plant. It is recommended to increase the manoeuvring area both inside and outside the squares and in the hall as well as the warehouse space.

### 3.4 Karsy

The activity of the Plant in Karsy consists in accepting non-hazardous and hazardous waste, both from the domestic market and shipped from abroad, and recovery or disposal. In addition, the plant conducts activities consisting in collecting hazardous and non-hazardous waste.

The production of alternative fuels takes place from combustible industrial waste and segregated municipal waste, as well as thermal treatment of waste.

On the premises of the plant there are:

- Two installations for the production of alternative fuels (the so-called old and new lines) consisting of two lines for the production of alternative fuel RDF and a line for the production of PASi fuel
- Installation for thermal waste treatment

According to the classification of installations subject to the integrated permits, the installations operating at the Plant have been classified as recovery or disposal installations, except for the storage of hazardous waste, with a processing capacity of more than 10 tons per day, i.e. installations for:

- line No. 1- an installation for the production of alternative fuel from waste with a capacity of up to 180,000 tonnes / year,
- line No. 2 - installation for the production of alternative fuel from waste with a capacity of up to 100,000 tonnes / year,
- installation for thermal processing of waste with a capacity of up to 25,000 tonnes / year

The plant is located in industrial areas in the immediate vicinity of the Ożarów Cement Plant. There are no sensitive areas in the immediate vicinity.

#### **Processing Allowed:**

- R12 Exchange of waste to submit to any of the processes listed in R1 to R11
- R1 Use mainly as a fuel or other means of generating energy
- D10 Incineration on land

**Formal and legal status**

The plant has a regulated formal and legal status of waste management. Installations operating on the premises of the Plant are subject to the requirement of obtaining an integrated permit. Currently, the plant has two decisions regulating the principles of the Plant's operation:

1. Decision of April 11, 2008, OWŚ.VII.7650-10 / 2008 issued by the Marshal of the Świętokrzyskie Voivodeship, integrated permit for the alternative fuel production installation line I with subsequent changes:

- Decision of June 17, 2010, WŚ.VII.7651-8 / 2010 issued by the Marshal of the Świętokrzyskie Voivodeship, changing the integrated permit
- Decision of 16.05.2014 r. WŚ.VII.7222.37.2013 issued by the Marshal of the Świętokrzyskie Voivodeship changing the integrated permit
- Decision of December 3, 2014, OWŚ-VII.7222.72.2014 issued by the Marshal of the Świętokrzyskie Voivodeship, changing the integrated permit
- Decision of June 15, 2016, OWŚ-VII.7222.24.2015 issued by the Marshal of the Świętokrzyskie Voivodeship, changing the integrated permit
- Decision of April 5, 2017, OWŚ-VII.7222.2.2017 issued by the Marshal of the Świętokrzyskie Voivodeship, changing the integrated permit
- Decision of December 6, 2017, OWŚ-VII.7222.23.2017 issued by the Marshal of the Świętokrzyskie Voivodeship, changing the integrated permit

2. Decision of 07/01/2013. OWŚ.VII.7222.12.2012 issued by the Marshal of the Świętokrzyskie Voivodeship - Integrated permit covering the following installations:

1) for recovery or disposal, with the exception of storage, of hazardous waste with a processing capacity of over 10 tons per day - for the production of alternative fuel from non-hazardous and hazardous waste with a capacity of up to 100,000 tonnes / year;

2) for recovery or neutralization, with the exception of storage, of hazardous waste with a processing capacity of more than 10 tons per day - for thermal treatment of waste with a capacity of up to 25,000 tonnes / year, constituting a heat source for a waste dryer.

Moreover, the decision covers an alternative fuel drying installation consisting of two dryers with a capacity of 100,000 tonnes / year each, which gives a total of 200,000 tonnes / year.

as amended:

- Decision of June 13, 2014, OWŚ.VII.7222.36.2013 issued by the Marshal of the Świętokrzyskie Voivodeship, changing the integrated permit
- Decision of 03/12/2014. , OWŚ-VII.7222.73.2014 issued by the Marshal of the Świętokrzyskie Voivodeship changing the integrated permit
- Decision of June 15, 2016, WŚ-VII.7222.25.2015 issued by the Marshal of the Świętokrzyskie Voivodeship, changing the integrated permit
- Decision of April 6, 2017, OWŚ-VII.7222.21.2016 issued by the Marshal of the Świętokrzyskie Voivodeship, changing the integrated permit
- ex officio correction of May 8, 2017, OWŚ-VII.7222.21.2016 of the decision of April 6, 2017. OWŚ-VII.7222.21.2016
- Water permit for deep water intake from wells S-1 and S-2 (granted with an integrated permit) decision of April 6, 2017, OWŚ-VII.7222.21.2016 issued by the Marshal of the Świętokrzyskie Voivodeship

In addition, the plant has agreed fire conditions related to waste management - Decision of May 16, 2019, PZ.5560.7.2019 issued by Commander of the County State Fire Service in Opatów.

**Plant operations****Line number 1**

The total amount of waste to be recovered on line no. 1 will not exceed 180,000 tonnes per year.

The installation for the production of alternative fuels - line 1 includes:

1. Production hall with a technological line.
2. Shelters for produced alternative fuels and waste.
3. Auxiliary shelters.
4. Administration building.
5. Metal silo for dust or lime waste, capacity 60 tonnes.
6. Reinforced concrete silo for sludge with a capacity of 75 m<sup>3</sup>.
7. Container for liquid waste with a capacity of 50 m<sup>3</sup>.
8. Car scales.
9. Transformer station with power lines.
10. A warehouse building with a ramp, divided for waste and spare parts.

A technological line with a capacity of 25 tons / h for waste shredding is installed in the production hall. The installation is equipped with magnetic and pneumatic separators, separating metals and other solid and mineral impurities. In the vicinity of the technological line, there are 3 waste storage tanks located on a hardened and canalised area. Under the shed adjacent to the production hall, there is a 50 m<sup>3</sup> liquid waste container, equipped with a pump feeding liquid waste to the sprinkler system. The reinforced concrete tank for slurry storage and the agitator are also located under the storage shelter. The metal silo for dusty waste is located in the area of the reinforced concrete tank.

The alternative fuel production cycle consists of the following stages:

- a) weighing on a scale, records of waste delivered to the plant, checking the compliance of the delivered waste with the documents provided,
- b) transport of waste to waste storage facilities,
- c) fragmentation of waste,
- d) mixing sludge with dusty waste,
- e) sprinkling (if necessary) alternative fuel with liquid waste,
- f) storage of alternative fuel,
- g) transport to the recipient.

The main sources of organized emissions to air from waste recovery installations are the processes of filling storage tanks: a silo for loose materials, a silo is equipped with a fabric filter and a tank for liquid waste. Organized emission of dust into the air may take place from technological processes carried out within the production hall equipped with four fans with active carbon DAExC-315 type with a capacity of 6000 m<sup>3</sup> / h each. An important element limiting dust emission to the air is the PULS-JET-BHF dedusting installation. Dust pollutants from above the conveyor carrying shredded waste in the production hall are captured and cleaned on fabric filters.

**Line number 2**

The production of alternative fuels from waste consists in the grinding of pre-sorted combustible waste on a set of grinding and separating devices to a size of approximately 30 mm. The alternative fuel preparation installation includes the following set of devices:

1. Loading channel conveyor
3. Belt conveyors

4. Overband magnetic separators of ferrous metals to separate ferrous impurities
5. Air separator for separation from the material flow
6. Second stage shredders
7. Dedusting system

The installation for the production of alternative fuels includes:

- a production hall with a technological line
- shelters for produced alternative fuels and waste
- auxiliary shelters
- administrative building
- metal silo for dusty waste or lime with a capacity of 60 tonnes
- reinforced concrete silo for sludge with a capacity of 73 m<sup>3</sup>
- liquid waste tank with a capacity of 50 m<sup>3</sup>
- car scale
- Transformer station with power lines
- a warehouse building with a ramp, divided for waste and spare parts

#### **Installation for thermal waste treatment**

The technology based on a rotary kiln with a multi-stage flue gas cleaning system is used for thermal waste conversion.

The following types of waste will be fed to the thermal waste treatment installation:

- solid waste loaded by a ram, fed by an overhead crane or containers (skip lift) to the loading hopper,
- liquid waste, high calorific value injected at the beginning of the post-combustion chamber,
- liquid waste, low calorific value and sludge injected at the rear of the rotary kiln.

The furnace for thermal processing of waste is based on a counter-current rotary furnace with a combustion temperature of 850-1000 ° C. The furnace is equipped with a cylindrical chamber, charging systems, pneumatic closure, a system directing the exhaust gases from the furnace to the afterburning chamber, a main burner powered by light oil. Fuel is stored in an underground double-layer tank, an ash removal system, an afterburning chamber with a temperature of 1100-1300 ° C, bypass as a safety valve in critical situations, installations for heat recovery and energy production, 1500kW turbine and generator, steam condenser, buffer tank feed water, exhaust gas cleaning system with chemical neutralization, bag filter and wet scribe. Electricity is used for own needs and the surplus is directed to the power grid.

The installation of thermal waste treatment is equipped with an emergency emitter, which will discharge pollutants into the air in the event of a failure of the thermal waste treatment line (through the bypass located on the flue gas duct). At the same time, in the event of any disruptions in technological processes and technical operations relating to the operation of combustion installations, resulting in exceeding the emission standards, as well as a drop in the temperature in the afterburning chamber below 1,100 ° C, the feeding of waste to the installation will be automatically suspended.

The installation operation time in abnormal conditions does not exceed 60 hours in a calendar year.

The waste incineration installation has been equipped with:

- a system for reducing NO<sub>x</sub> emissions by injecting urea into the cooling tower (selective non-catalytic reduction),
- system of chemical neutralization of acid gas components and adsorption of heavy metals (possibly formed dioxins and heavy metals) by injection into the sodium bicarbonate flue gas stream in parallel with the activated carbon. The maximum hourly consumption of sodium bicarbonate is 288 kg / h, and of activated carbon 28 kg / h,

- a system for removing dust generated in the process of incineration of waste along with the remains of reagents on a bag filter ensuring the concentration at the outlet at a maximum level of 10 mg / m<sup>3</sup>,
- flue gas cleaning system in a wet scrubber by chemical cleaning of flue gases (mainly HC1). The scrubber will be supplied with a 40% NaOH solution, the amount of which will be dosed automatically based on the readings of the pH meter.

The company performs physical and chemical tests of the properties of waste generated as a result of thermal waste treatment.

#### **Alternative fuel drying installation**

The alternative fuel is dried in two belt and tunnel dryers with a capacity of 20 tonnes / h each. The alternative fuel is dried with warm air at a temperature of about 105 ° C, which flows through the material heated to a temperature of about 50 ° C. The time of fuel drying on the belt, i.e. fuel transport through the dryer, is adjustable and will be 15 + 30 minutes. The fuel then goes to the cooling chamber to lower the temperature and evaporate the moisture. After the entire process, the fuel, dried to a humidity of about 10%, is sent to a belt conveyor, which is transported to storage.

The main sources of emissions are the alternative fuel preparation system, alternative fuel drying installation, waste incineration installation - main chimney and emergency chimney, ventilation of the fuel preparation hall.

According to the information, waste intended for recovery is stored in a selective manner, in designated areas, protected against unauthorized access.

For solid waste storage, facilities and storage places within concrete and sewage systems 1112/1, 1112/2, 1112/3, to which Mo-Bruk has legal title, are designated. Hazardous waste is collected in a hazardous waste warehouse adapted to the storage of this type of waste, and on plots, in sealed barrels and containers only within the sewage area. Liquid waste is stored in a double-walled tank with a capacity of 50 m, sludge in a reinforced concrete silo, and dusty waste in a steel silo.

On the premises of the plant there are:

- storage building intended for waste for thermal processing,
- hazardous waste warehouse,
- a shelter for non-hazardous waste.

The recipients of alternative fuel produced by the Plant are cement plants located in Ożarów, Nowiny near Kielce from Lafarge Małogoszcz (PAS-I). Post-process waste in the form of, among others slags, bottom ash, dust from the dust collector are utilized in the cementation process in another installation belonging to the MOBRUK Group (Niecew).

The waste was shipped for disposal in the D10 process on the line of the incineration plant or the treatment / recovery R12, R1 on two lines of the alternative fuel production plant.

Domestic sewage from the installation is discharged to the sanitary sewage system and the treatment plant operated by the Ożarów Cement Plant. Rainwater from the area where the IPPC installation is located, after pre-treatment in a separator, is discharged into the rainwater drainage system of the Ożarów Cement Plant. The rainwater drainage system in the area of the installation is equipped with the following pretreatment devices:

- coalescence separator,
- 3-chamber sedimentation tank equipped with a floating pump for pumping rainwater to the coalescence separator.

The installation uses its own groundwater wells (two drilled wells) for sanitary purposes in line with the water permit issued by the Marshal of the Świętokrzyskie Voivodeship.

It also has a second independent water source, which is the water supply network of the Ożarów Group.

#### **Summary**

The site was not visited for pandemic reasons. The installation was visited virtually through the monitoring cameras installed in the plant. Due to the above, it was not possible to fully inspect the installation. After analysing the information provided by the Company, it can be concluded that the Plant in Karsy meets the requirements of environmental protection regulations.

It should be noted that for the discharge of sewage to the sewage system of a third party, the Plant should obtain a separate water permit. Currently the discharge is regulated by the integrated permit.

### 3.5 Summary of the review

Assessment undertaken to date indicates that the potential environmental and social impacts of the plants are expected to be relatively minor. Mo-BRUK plants are operating within the formal requirements of Polish regulations. In our opinion, in short term, the company will need to create a company-wide internal management system dealing in more structured way with environmental and social issues. It will be also recommended to strengthen the Environmental department team at the corporate level, as implementation of BAT conclusions requirements, and management systems will be associated with more workload for the team.

- The company operates in line with the applicable integrated permits granted by local government administration bodies. All integrated permits are issued for an indefinite period.
- Currently, all installations are subject to the process of issuing decisions amending the integrated permit resulting from new waste management regulations related to fire protection. As the sites are used for waste storage before processing, the permits should include:
- process R13 - Storage of waste prior to any of the processes listed in items R1-R12 (except for initial storage at the waste producer)

and

- process D15 - Storage prior to any of the processes listed in items D1 to D14 (except for pre-storage at the waste producer).
- All plants adequately control the incoming waste at the site.
- Waste for processing goes through a qualification procedure in order to direct it to the appropriate installation and process it in the most effective way.
- The plants carry out ongoing monitoring of waste by filling in appropriate electronic documents in the BDO system (database on waste and waste packaging).
- The company complies with the requirements for monitoring emissions in accordance with the principles set out in the dedicated emission permits.
- Each plant reports to the appropriate marshal's offices.
- Each plant pays appropriate fees for using the environment in accordance with the legal requirements.
- The company imports waste from abroad and transports waste abroad. For the purposes of transboundary transport of waste, it has the appropriate approvals of the Chief Inspectorate of Environmental Protection
- The company meets all the requirements imposed by the provisions of the Act on waste related to fire protection.
- All plants have fire instructions. and provisions approving fire protection operations
- All plants have monitoring of waste storage places. In the case of combustible waste, the Company was obliged to provide the logins to the system to the Provincial Inspector for Environmental Protection, according to the information, the login to the monitoring system at the Karsy Plant was transferred to the Provincial Inspectorate of Environmental Protection, no information was provided whether it was also provided at other plants where combustible waste management is carried out (Wałbrzych, )
- The most complicated legal situation is at the Wałbrzych Plant, as since 2016 proceedings have been underway at various administrative levels regarding the withdrawn integrated permit decision. However, it should be mentioned that the final decision to withdraw the permit without compensation has not been issued, the plant has its decisions updated on an ongoing basis in accordance with legal requirements and is operating in line with the permit.
- The public perception of the plants operation is rather unfavourable, especially in locations close to housing areas (Wałbrzych, Niecew). It is related to a typical sociological phenomenon:

NIMBY Syndrome (Not In My Back Yard) - there is a belief that investments of this type should not be located "in my back yard"

LULU syndrome, ie (Locally Unacceptable Land Use) "land development unwanted by society".