Environmental Product Declaration

In accordance with ISO 14025:2006 and EN 15804:2012+A2:2019/AC:2021 for:

Copper Wire Rod

from

KGHM Polska Miedź S.A.

Programme:	SRC EPD program v.1.0
Programme operator:	Silk Road Certification Sp. z o.o.
EPD registration number:	SRC/2026/06/30/EPD/01
Version date:	15.06.2026
Validity date:	29.06.2029

An EPD should provide current information and may be updated if conditions change.

GENERAL INFORMATION

Programme information

Programme:	SRC EPD program v.1.0
Address:	ul. Lubliniecka 17 44-102 Gliwice Poland
Website:	www.osrc.org.pl
E-mail:	epd@src.org.pl

Accountabilities for PCR, LCA and independent, third-party verification
In accordance with the requirements of:
En 15804:2012+A2:2019
Life Cycle Assessment (LCA)
LCA accountability: *Mineral and Energy Economy Research Institute, Polish Academy of Sciences (MEERI PAS), Strategic Research Division, 31-261 Krakow, Wybickiego 7a contact: kulczycka@meeri.pl*
Third-party verification
Independent third-party verification of the declaration and data, according to ISO 14025:2006, via: SILK ROAD CERTIFICATION SP. Z O.O. Registered and correspondence address: Lubliniecka 17 44-102 Gliwice Poland Office: Toszecka 99 44-100 Gliwice Poland Office 438 3rd floor, EU VAT: PL6312685442, REGON: 383188194
Procedure for follow-up of data during EPD validity involves third party verifier: ☐ Yes ☒ No

The EPD owner has the sole ownership, liability, and responsibility for the EPD.

EPDs within the same product category but registered in different EPD programmes, or not compliant with EN 15804, may not be comparable. For two EPDs to be comparable, they must be based on the same PCR (including the same version number) or be based on fully-aligned PCRs or versions of PCRs; cover products with identical functions, technical performances and use (e.g. identical declared/functional units); have equivalent system boundaries and descriptions of data; apply equivalent data quality requirements, methods of data collection, and allocation methods; apply identical cut-off rules and impact assessment methods (including the same version of characterisation factors); have equivalent content declarations; and be valid at the time of comparison. For further information about comparability, see EN 15804 and ISO 14025.

INFORMATION ABOUT EPD OWNER

Owner of the EPD: KGHM Polska Miedź S.A.
Address: Huta Miedzi „Cedynia", Orsk, 59-305 Rudna, Polonia
Contact: Daniel Głowacki [daniel.glowacki@kghm.com]

Description of the organisation: KGHM Polska Miedź S.A. is a global, technologically advanced mining and metallurgy company and one of the leading producers of copper and silver worldwide. The company has been operating for more than 60 years, developing an integrated production model based on its own mineral resources, mines, ore processing facilities and metallurgical plants. The core of KGHM's operations is located in south-western Poland, where one of Europe's largest copper ore deposits is situated. KGHM operates mining and production assets in Europe, North America and South America, and its product portfolio includes copper cathodes, copper wire rod, oxygen-free copper products, silver and other valuable metals.

KGHM is the largest producer of mined copper in Europe and remains among the top 10 copper producers globally. According to the World Silver Survey 2026, the company is also the second-largest global silver producer. Copper OFE Wire is manufactured at the Cedynia Wire Rod Plant Division of KGHM Polska Miedź S.A. in Orsk, Poland, where oxygen-free copper wire is produced using UPCAST technology. The Cedynia plant processes electrolytically refined copper cathodes from KGHM's Głogów and Legnica copper smelter/refineries, as well as copper scrap, into high-quality copper wire rod and oxygen-free copper products.

PRODUCT INFORMATION

Product name: Copper Wire Rod Cu-ETP

Visual representation (e.g., an image) of the product:

Product description: KGHM Polska Miedź S.A., Cedynia Copper Wire Rod Plant Division, located in Orsk, Poland, produces copper wire rod with diameters of 8 mm ± 0.4 mm and 10 mm ± 0.4 mm using the continuous melting, casting and rolling method, based on the Contirod technology.

In the production process, copper cathodes are melted and cast into a copper strip, which is subsequently rolled into copper wire rod and coiled. The surface of the wire rod is cleaned by the alcohol method and coated with a synthetic wax layer, which protects the surface against oxidation during transport and storage.

The wire rod has a uniform microstructure and uniform oxygen distribution. The oxygen content is controlled to ensure good drawability and a low recrystallisation temperature. The product is intended for further drawing on single-wire and multi-wire machines and is used for the production of conductive cores in electrical cables and wires, including enamelled wires, automotive wires and connection cords.

The Cedynia Copper Wire Rod Plant Division operates an Integrated Management System covering the production of copper wire rod. The current scope and validity of the relevant ISO certificates should be confirmed on the basis of the latest certificates issued for KGHM Polska Miedź S.A.

Name and location of production site(s): Huta Miedzi „Cedynia”, Orsk, 59-305 Rudna, Polonia

CONTENT DECLARATION

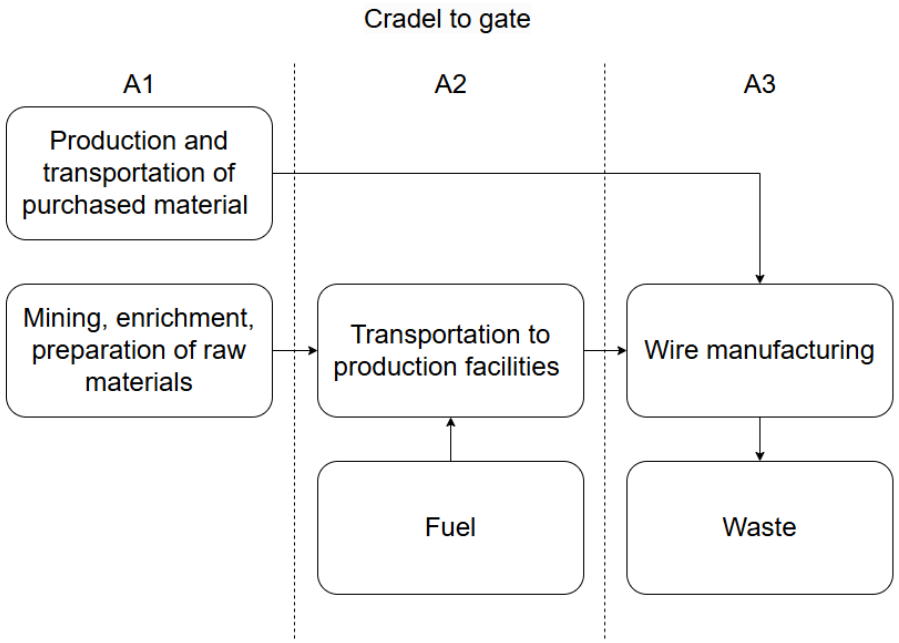
- The mass (weight) of one unit of a product, as purchased or per declared unit: 1kg of manufactured Copper Wire Rod Cu-ETP-8-CL
- Content of the product in the form of a list of materials and substances, and their mass: Cu-ETP copper / copper cathode = 1.00 kg
- The declared share of biogenic/recycled materials: Biogenic material in the product: 0%. Biogenic material in packaging: 25.015 kg per packaging set, corresponding to approximately 48.85% of the total packaging mass. Recycled material in packaging: not declared.

Product content	Mass, kg	Post-consumer recycled material, mass-% of product	Biogenic material, mass-% of product	Biogenic material, kg C/product or declared unit
Copper cathode	1.00	30,3	0	0
TOTAL	1.00	30,3	0	0

Packaging materials	Mass, kg	Mass-% (versus the product)	Biogenic material, kg C/product or declared unit
Wooden pallets	50.030	1.06	50% - 25.015 kg C/kg*
Foil hood	0.406	< 0.01	0% - 0 kg C/kg
PET straps	0.324	< 0.01	0% - 0 kg C/kg
Stretch foil	0.450	< 0.01	0% - 0 kg C/kg
Label	0.002	< 0.01	0% - 0 kg C/kg
TOTAL	51.212	1.09	

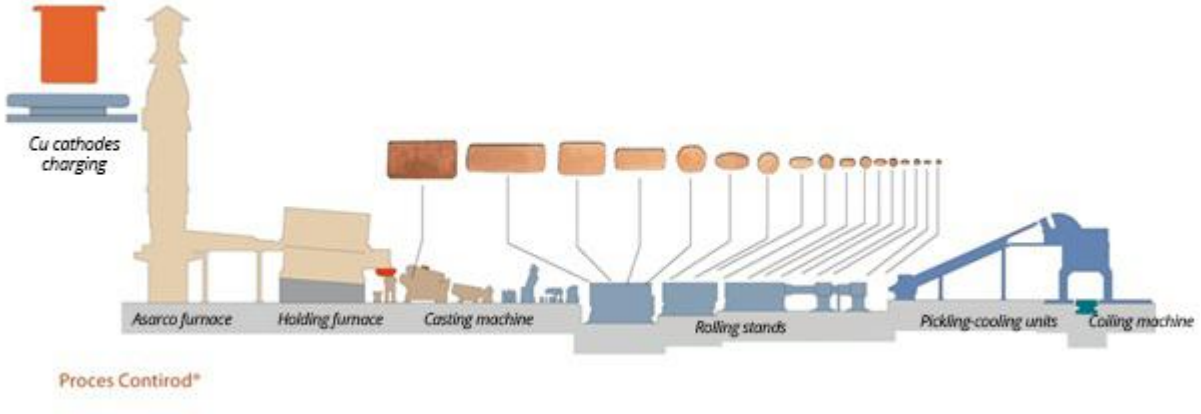
LCA INFORMATION

Functional unit: 1kg of manufactured Copper Wire Rod Cu-ETP-8-CL
Time representativeness: 2024 year
Geographical scope: Lower Silesian Voivodeship
Database(s) and LCA software used: Database: Ecoinvent 3.11 (EN 15804); Software: Simapro 10.3.0.1
System boundaries: Cradle to gate (A1–A3).



Cradle-to-gate process flow diagram for Copper Wire Rod production, including modules A1–A3

Process flow diagram:



Schematic representation of the Contirod process for copper wire rod production

The copper wire rod production process presented in the above schemes covers the cradle-to-gate system boundary for Copper Wire Rod manufactured by KGHM Polska Miedź S.A. The process begins with the extraction of copper ore from KGHM's underground mines, including the Rudna Mining Plant, Lubin Mining Plant and Polkowice-Sieroszowice Mining Plant. The extracted ore is then processed in KGHM's concentrator plants, where it is enriched to produce copper concentrate suitable for further metallurgical processing.

The copper concentrates are prepared for smelting through operations such as drying, blending and, where applicable, briquetting. The prepared concentrates are then processed in KGHM's smelting and refining facilities. At the Głogów Copper Smelter and Refinery, copper concentrate is processed using flash smelting technology to produce blister copper. At the Legnica Copper Smelter and Refinery, copper is produced using shaft furnace technology and electrorefining. Metallurgical slags and intermediate copper-bearing products are further processed in order to recover additional copper and other valuable metals.

In the next stage, copper matte and other copper-bearing intermediate products are converted into blister copper. The blister copper is then subjected to fire refining and cast into copper anodes. These anodes are refined by electrolysis to obtain high-purity copper cathodes, which constitute the main feedstock for copper wire rod production.

The high-purity copper cathodes are transported to the Cedynia Copper Wire Rod Plant Division of KGHM Polska Miedź S.A. in Orsk, Poland. At the Cedynia plant, the cathodes are processed using the Contirod continuous melting, casting and rolling process. In this process, copper cathodes are melted, the molten copper is cast into a copper strip and then rolled into copper wire rod. The finished wire rod is subsequently coiled, cooled, surface-treated and prepared for shipment.

The final product covered by this EPD is high-quality Cu-ETP copper wire rod, supplied in coils and intended for further processing, mainly drawing into wires and conductors for electrical and industrial applications.

LCIA methodology and types of impacts

The analysis uses the Environmental Footprint (EF) method, which is a tool for identifying the environmental impact of a product or organization throughout its life cycle. It covers all relevant information about a product or organization, from raw material extraction to disposal. EF is a method based on life cycle analysis (LCA) to quantify the environmental impacts of products (goods or services) and organizations. The main objective of the information obtained through the PEF and OEF method is to reduce the environmental impact of products, services and organizations, taking into account activities in the supply chain (from raw material extraction, production and use to waste management).
The JRC (Joint Research Center) EU plays a key role in the context of EF. It is responsible for the technical and scientific development of EF methods, defining methodological requirements for conducting EF studies, and for many activities related to the development and provision of data.

Initial assumptions
The Upcast line, which separates out a cathode loading system, a melting furnace, a de-stacking furnace, a casting machine with crystallizers for vertical casting, and coilers, produces oxygen-free copper wire.

Production processes at each of KGHM's three smelters are based on different technologies. HM Legnica produces copper in the form of cathodes using shaft furnace technology and the processing of copper scrap. At HM “Glogow I”, shaft furnaces were stopped in 2016 and the world's largest flash furnace and electric furnace installation was put into operation, creating a state-of-the-art smelter copper production line. In HM “Glogow II” copper is smelted based on similar technology, so currently production in both production lines of HM “Glogow” is based on single-dial melting in the flash furnace. HM “Cedynia” is a copper rolling mill, processing electrolytic copper into wire rod using the Contirod method and wire using Upcast technology. These products meet the needs of the most demanding markets.
In creating the model for modules A1-A3, the following indicators from the Ecoinvent 3.9 database were used, occurring at all stages of production according to proces diagram and the system's boundary assumptions.

Electricity modelling
Electricity production data were modeled on the basis of data received from KGHM Polska Miedź S.A. on the purchase of electricity, broken down by licensed suppliers (Tauron Sprzedaż Sp. Z o.o., Enea S.A., Energetyka Sp. z o.o., Alpiq SE), Energetyka Sp. z o.o. and KGHM's generation sources (modern gas-steam units in Polkowice and Głogów). Modeling was carried out based on the structure of fuels and other primary energy carriers consumed for electricity generation, as well as emission volumes for individual fuels and other primary energy carriers for the above-mentioned entities. An energy mix was prepared for KGHM Polska Miedź S.A. based on the amount of energy purchased from individual suppliers. The set modeled in this way was used in the analysis. The structure is shown in Table 1.

Tabel 1. Energy mix used in KGHM

Energy supplier	**By volume of energy purchased**	
	MWh	**%**
TGE S.A.	1962295.32	78,16
Tauron Sprzedaż Sp. z o.o.	489814.27	19,51
Energetyka Sp. z o.o.	58383.68	2,33
TOTAL	2510493,27	100

Table 2. Comparison of characterized results of impact category indicators for annual electricity production (“KGHM mix” and Poland's energy mix) per 1kWh.

Damage category	Unit	KGHM medium voltage 2024	Poland – residual electricity mix, high voltage	Poland – electricity production mix, high voltage
Acidification	mol H+ eq	1.46E+00	6.64E+00	6.71E+00
Climate change	kg CO2 eq	6.22E+02	1.07E+03	9.58E+02
Ecotoxicity, freshwater	CTUe	2.14E+03	2.19E+03	2.72E+03
Particulate matter	disease inc.	6.19E-06	7.82E-06	7.82E-06
Eutrophication, marine	kg N eq	2.47E-01	7.63E-01	6.49E-01
Eutrophication, freshwater	kg P eq	8.52E-02	4.35E-02	1.18E-01
Eutrophication, terrestrial	mol N eq	2.09E+00	8.41E+00	7.19E+00
Human toxicity, cancer	CTUh	1.00E-07	6.63E-08	1.17E-07
Human toxicity, non-cancer	CTUh	7.31E-06	5.29E-06	9.54E-06
Ionising radiation	kBq U-235 eq	2.50E+00	4.78E+00	1.18E+00
Land use	Pt	2.20E+03	8.94E+02	1.33E+03
Ozone depletion	kg CFC11 eq	6.14E-06	1.07E-05	2.31E-06
Photochemical ozone formation	kg NMVOC eq	8.04E-01	2.43E+00	2.09E+00
Resource use, fossils	MJ	8.79E+03	1.19E+04	1.00E+04
Resource use, minerals and metals	kg Sb eq	1.61E-05	4.23E-06	2.30E-05
Water use	m3 depriv.	1.09E+02	7.65E+01	8.01E+01

Modules declared, geographical scope, share of primary data (in GWP-GHG results) and data variation (in GWP-GHG results):

	Product stage			Distribution/ installation stage		Use stage							End-of-life stage					Beyond product life cycle
	Raw material supply	Transport	Manufacturing	Transport	Construction installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal		Reuse-Recovery-Recycling-potential
Module	**A1**	**A2**	**A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**		**D**
Modules declared	x	x	x	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND
Geography	GLO/ PL	GLO/ PL	PL	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	ND

Modules/processes/life-cycle stages declared shall be noted with “X”.
Modules/processes/life-cycle stages not declared shall be marked as “ND”.
Geographical scope shall be reported by the country code(s) (e.g., UK, FR, DE) and/or name of the region(s) (e.g., EU 27, Global).
A variation of 0% shall be reported in EPDs of one product or site.

ENVIRONMENTAL PERFORMANCE

LCA results of the product(s) - main environmental performance results

Mandatory impact category indicators according to EN 15804

Results per functional or declared unit															
Indicator	**Unit**	**A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
GWP-total	kg CO_2 eq.	1.69E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
GWP-fossil	kg CO_2 eq.	1.70E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
GWP-biogenic	kg CO_2 eq.	-4.90E-03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
GWP-luluc	kg CO_2 eq.	8.28E-04	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
ODP	kg CFC 11 eq.	5.74E-08	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
AP	mol H^+ eq.	7.83E-03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
EP-freshwater	kg P eq.	1.70E-04	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
EP-marine	kg N eq.	2.25E-03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
EP-terrestrial	mol N eq.	1.80E-02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
POCP	kg NMVOC eq.	6.02E-03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
ADP-minerals&metals*	kg Sb eq.	1.13E-04	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
ADP-fossil*	MJ	2.58E+01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
WDP*	m^3	-9.25E-01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Acronyms	GWP-fossil = Global Warming Potential fossil fuels; GWP-biogenic = Global Warming Potential biogenic; GWP-luluc = Global Warming Potential land use and land use change; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential, Accumulated Exceedance; EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment; EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment; EP-terrestrial = Eutrophication potential, Accumulated Exceedance; POCP = Formation potential of tropospheric ozone; ADP-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption														

** Disclaimer: The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.*

The EPD shall include a statement, in connection to the results of the impact indicators:" The estimated impact results are only relative statements, which do not indicate the endpoints of the impact categories, exceeding threshold values, safety margins and/or risks."

The following statement, if the EPD covers the end-of-life stage: "The results of the end-of-life stage (modules C1-C4) should be considered when using the results of the product stage (modules A1-A3)." For services, "A1-A3" shall be replaced by "A1-A5".

If results based on an old EF version is used to develop an EPD, the EPD shall include a statement that clarifies that an EPD based on an old EF version has been used as a data source, and that this was assessed to yield identical or conservative results compared to fully using the current EF version.

If biogenic carbon leaving the product system in module A5 (see Annex 2 of PCR) or recovered energy leaving the product system in modules A5 or C (see Annex 3 of PCR) have been balanced out already in modules A1-A3, a statement in this regard shall be included.

Additional mandatory and voluntary impact category indicators

Results per functional or declared unit															
Indicator	**Unit**	**A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
GWP-GHG[1]	kg CO_2 eq.	1.69E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Resource use indicators

Results per functional or declared unit																
Indicator	**Unit**	**A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
PERE	MJ	3.06E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PERM	MJ	0.00E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PERT	MJ	3.06E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PENRE	MJ	2.58E+01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PENRM	MJ	0.00E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
PENRT	MJ	2.58E+01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
SM	kg	3.92E-03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
RSF	MJ	3.31E-03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
NRSF	MJ	0.00E+00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
FW	m^3	1.57E-02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Acronyms	PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy re-sources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water															

[1] This indicator accounts for all greenhouse gases except biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. As such, the indicator is identical to GWP-total except that the CF for biogenic CO_2 is set to zero.

Waste indicators

Results per functional or declared unit																
Indicator	**Unit**	**A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
Hazardous waste disposed	kg	1.35E-01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Non-hazardous waste disposed	kg	4.74E+01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Radioactive waste disposed	kg	2.36E-05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND