

# Environmental product declaration

in accordance with ISO 14025 and EN 15804+A2

## Crushed Rock Aggregates from Norsk Stein - Jelsa Quarry



The Norwegian EPD Foundation

**Owner of the declaration:**

Norsk Stein AS

**Product:**

Crushed Rock Aggregates from Norsk Stein - Jelsa Quarry

**Declared unit:**

1 tonne

**This declaration is based on Product Category Rules:**

CEN Standard EN 15804:2012+A2:2019 serves as core PCR

NPCR 018:2022 Part B for natural stone products, aggregates and fillers

**Program operator:**

The Norwegian EPD Foundation

**Declaration number:**

NEPD-4799-4059-EN

**Registration number:**

NEPD-4799-4059-EN

**Issue date:** 04.09.2023

**Valid to:** 04.09.2028

**EPD Software:**

LCA.no EPD generator ID: 52263

## General information

### Product

Crushed Rock Aggregates from Norsk Stein - Jelsa Quarry

### Program operator:

Post Box 5250 Majorstuen, 0303 Oslo, Norway  
The Norwegian EPD Foundation  
Phone: +47 23 08 80 00  
web: [post@epd-norge.no](mailto:post@epd-norge.no)

### Declaration number:

NEPD-4799-4059-EN

### This declaration is based on Product Category Rules:

CEN Standard EN 15804:2012+A2:2019 serves as core PCR  
NPCR 018:2022 Part B for natural stone products, aggregates and fillers

### Statement of liability:

The owner of the declaration shall be liable for the underlying information and evidence. EPD Norway shall not be liable with respect to manufacturer information, life cycle assessment data and evidences.

### Declared unit:

1 tonne Crushed Rock Aggregates from Norsk Stein - Jelsa Quarry

### Declared unit with option:

A1,A2,A3,A4

### Functional unit:

### General information on verification of EPD from EPD tools:

Independent verification of data, other environmental information and the declaration according to ISO 14025:2010, § 8.1.3 and § 8.1.4. Verification of each EPD is made according to EPD-Norway's guidelines for verification and approval requiring that tools are i) integrated into the company's environmental management system, ii) the procedures for use of the EPD tool are approved by EPD-Norway, and iii) the process is reviewed annually by an independent third party verifier. See Appendix G of EPD-Norway's General Programme Instructions for further information on EPD tools

### Verification of EPD tool:

Independent third party verification of the EPD tool, background data and test-EPD in accordance with EPDNorway's procedures and guidelines for verification and approval of EPD tools.

Third party verifier:

Martin Erlandsson, IVL Swedish Environmental Research Institute  
(no signature required)

### Owner of the declaration:

Norsk Stein AS  
Contact person: Henrik Skogland  
Phone: + 47 47 33 52 82  
e-mail: [skogland@mibau-stema.com](mailto:skogland@mibau-stema.com)

### Manufacturer:

Norsk Stein AS  
Jelsavegen 512  
4234 Jelsa, Norway

### Place of production:

Norsk Stein, Jelsa

, Norway

### Management system:

### Organisation no:

958 990 022

### Issue date:

04.09.2023

### Valid to:

04.09.2028

### Year of study:

2020

### Comparability:

EPD of construction products may not be comparable if they not comply with EN 15804 and seen in a building context.

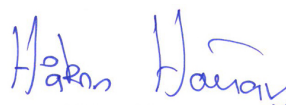
### Development and verification of EPD:

The declaration is created using EPD tool lca.tools ver EPD2022.03, developed by LCA.no. The EPD tool is integrated in the company's management system, and has been approved by EPD Norway.

Developer of EPD: Stian Johansen

Reviewer of company-specific input data and EPD: Henrik Skogland

### Approved:



Håkon Hauan

Managing Director of EPD-Norway

## Product

### Product description:

Our quarry at Jelsa provides us with a very versatile and high-quality granodiorite aggregate. The aggregates are used in the concrete and asphalt industry, railway construction, hydraulic engineering, in roadbeds, the offshore industry, and numerous other applications.

### Product specification

Crushed rock (granodiorite) in bulk - aggregates for various uses.

In compliance with Regulation 305/2011/EU of the European Parliament and the Council of 9th of March 2011 (the Construction Products Regulation – CPR), we hold a certificate for construction of the following products, according to the approved standards:

- Aggregates for Concrete: EN 12620:2002+A1:2008
- Aggregates for Asphalt: EN 13043:2002
- Aggregates for Roads: EN 13242:2002+A1:2007
- Armourstone: EN 13383-1:2002+AC:2004
- Railway ballast: EN 13450:2002

Materials	Value	Unit
Bedrock - Granodiorite	1000	kg

### Technical data:

If applicable, products come along with a CE mark and DoP.  
Upon request we can also provide specific TDS.

Density: 2,75 ± 0.05 Mg/m<sup>3</sup>

More specific technical data/ material properties are stated in above mentioned DoP/ TDS

### Market:

From our production site at Jelsa, we mainly supply aggregates for the coastal regions along the North Sea and Baltic Sea throughout Europe. We also supply domestic markets.

### Reference service life, product

Norsk Stein products are tested according to all demanded properties according to CE.  
Results can be made available upon request.  
The high quality of our products provide a long-term service life in end-use for our customers.

### Reference service life, building or construction works

Not applicable.

## LCA: Calculation rules

### Declared unit:

1 tonne Crushed Rock Aggregates from Norsk Stein - Jelsa Quarry

### Cut-off criteria:

All major raw materials and all the essential energy is included. The production processes for raw materials and energy flows with very small amounts (less than 1%) are not included. These cut-off criteria do not apply for hazardous materials and substances.

### Allocation:

The allocation is made in accordance with the provisions of EN 15804. Incoming energy and water and waste production in-house is allocated equally among all products through mass allocation. Effects of primary production of recycled materials is allocated to the main product in which the material was used. The recycling process and transportation of the material is allocated to this analysis.

### Data quality:

Specific data for the product composition are provided by the manufacturer. The data represent the production of the declared product and were collected for EPD development in the year of study. Background data is based on EPDs according to EN 15804 and different LCA databases. The data quality of the raw materials in A1 is presented in the table below.  
Production data is collected in 2021 from the site of production for the year 2020.  
The data is from various internal logging systems within the company.

**System boundaries (X=included, MND=module not declared, MNR=module not relevant)**

Product stage				Construction installation stage	Use stage							End of life stage				Beyond the system boundaries
Raw materials	Transport	Manufacturing	Transport	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling-potential
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	X	X	X	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

**System boundary:**

As the products are mainly used for bound purposes, the end phase C1-C4 , and D are not considered in this EPD. This consideration will normally take place in the EPD published by producers of asphalt and concrete.





In order to find the specific result for the product in question, simply summarize the various processes needed to produce the final product. For example, if you want to see our environmental impact of producing 2/5 mm, simply summarize respective values stated in the below section **LCA: Results**

– in this case; from columns QUARRY/J + PRIMARY/J + SECONDARY/J + TERTIARY/J.  
The overall Global Warming Potential (GWP) of each product is also stated in the below column.]

PRODUCT	GWP kg CO2 eq	NEEDED PROCESSES to PRODUCE VARIOUS PRODUCTS	REMARKS
Raw Blast Rock	2,26	QUARRY	
63/200 mm	2,28	QUARRY + PRIMARY	
22/125 mm	2,37	QUARRY + PRIMARY + SECONDARY	
16/90 mm	2,37	QUARRY + PRIMARY + SECONDARY	
0/16 mm	2,37	QUARRY + PRIMARY + SECONDARY	
0/5 mm	2,37	QUARRY + PRIMARY + SECONDARY	
5/16 mm	2,37	QUARRY + PRIMARY + SECONDARY	
0/2 mm	2,61	QUARRY + PRIMARY + SECONDARY + TERTIARY	
2/5 mm	2,61	QUARRY + PRIMARY + SECONDARY + TERTIARY	
2/5 mm WASHED	2,61	QUARRY + PRIMARY + SECONDARY + TERTIARY	Washed as a part of the tertiary process.
5/8 mm	2,61	QUARRY + PRIMARY + SECONDARY + TERTIARY	
8/11 mm	2,61	QUARRY + PRIMARY + SECONDARY + TERTIARY	
11/16 mm	2,61	QUARRY + PRIMARY + SECONDARY + TERTIARY	
16/22 mm	2,61	QUARRY + PRIMARY + SECONDARY + TERTIARY	
22/32 mm	2,61	QUARRY + PRIMARY + SECONDARY + TERTIARY	
16/32 mm	2,61	QUARRY + PRIMARY + SECONDARY + TERTIARY	
30/60 mm	2,61	QUARRY + PRIMARY + SECONDARY + TERTIARY	
0/2 mm WASHED	2,67	QUARRY + PRIMARY + SECONDARY + TERTIARY + WASHING PLANT	Separate washing plant

Our loading system at Jelsa is capable of blending our single fractions and finished products into numerous different blends and variations, such as 0/32mm SUBBASE, 8/16mm, 2/8mm and so on.

In these cases, the specific blend will determine the total environmental impact the final loaded product has. A product might consist of fractions with different production processes. For example, a final blend could be made from fractions that all have been through the processes of QUARRY (100%) and PRIMARY (100%), but only partly SECONDARY (60%) and TERTIARY (40%). In these cases, NORSK STEIN will be able to produce a more product specific EPD for that particular blend.

**Additional technical information:**

## LCA: Scenarios and additional technical information

The following information describe the scenarios in the different modules of the EPD.

The method of transportation and distance chosen in this EPD is merely an example.

The actual destination and end-customers chosen method for transportation will have to be considered for each case.

Norsk Stein as a part of Mibau-Stema Group mainly sells and transports to international markets.







Our own fleet of vessels are highly efficient and in general are fitted with the newest of technology to reduce emissions.

In addition to international markets, we also supply domestic and local markets with the use of various third-party owned vessels and vehicles.

Transport from production place to user (A4)	Capacity utilisation (incl. return) %	Distance (km)	Fuel/Energy Consumption	Unit	Value (Liter/tonne)
Skip, Tilslagsbåt 35000 DWT (km)	50,0 %	1500	0,003	l/tkm	4,50

## LCA: Results

The LCA results are presented below for the declared unit defined on page 2 of the EPD document.

Environmental impact								
Indicator		Unit	QUARRY/ J (EN 15804 +A2)	PRIMARY/ J (EN 15804 +A2)	SECONDARY/ J (EN 15804 +A2)	TERTIARY/ J (EN 15804 +A2)	WASHING PLANT/ J (EN 15804 +A2)	A4
	GWP-total	kg CO <sub>2</sub> -eq	2,26E+00	2,28E+00	2,37E+00	2,61E+00	2,67E+00	1,64E+01
	GWP-fossil	kg CO <sub>2</sub> -eq	2,26E+00	2,28E+00	2,37E+00	2,61E+00	2,66E+00	1,64E+01
	GWP-biogenic	kg CO <sub>2</sub> -eq	3,73E-03	4,23E-03	4,93E-03	6,42E-03	7,89E-03	3,90E-03
	GWP-luluc	kg CO <sub>2</sub> -eq	3,34E-04	4,09E-04	5,18E-04	7,48E-04	9,67E-04	8,64E-03
	ODP	kg CFC11 -eq	3,15E-07	3,16E-07	3,32E-07	3,76E-07	3,80E-07	3,00E-06
	AP	mol H <sup>+</sup> -eq	1,51E-01	1,51E-01	1,52E-01	1,54E-01	1,54E-01	4,86E-01
	EP-FreshWater	kg P -eq	1,67E-05	1,80E-05	2,00E-05	2,45E-05	2,83E-05	5,40E-05
	EP-Marine	kg N -eq	4,87E-02	4,87E-02	4,90E-02	4,99E-02	5,00E-02	1,10E-01
	EP-Terrestrial	mol N -eq	7,68E-01	7,68E-01	7,71E-01	7,82E-01	7,82E-01	1,22E+00
	POCP	kg NMVOC -eq	1,42E-01	1,42E-01	1,43E-01	1,46E-01	1,46E-01	3,18E-01
	ADP-minerals&metals <sup>1</sup>	kg Sb -eq	2,02E-05	2,15E-05	2,35E-05	2,77E-05	3,17E-05	9,30E-05
	ADP-fossil <sup>1</sup>	MJ	2,41E+01	2,43E+01	2,56E+01	2,89E+01	2,96E+01	2,10E+02
	WDP <sup>1</sup>	m <sup>3</sup>	1,12E+01	5,43E+01	1,14E+02	2,39E+02	3,66E+02	4,89E+01

GWP-total = Global Warming Potential total; 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







"Reading example: 9,0 E-03 = 9,0\*10<sup>-3</sup> = 0,009"

\*INA Indicator Not Assessed

1. 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

### Remarks to environmental impacts

### Additional environmental impact indicators

Indicator		Unit	QUARRY/ J (EN 15804 +A2)	PRIMARY/ J (EN 15804 +A2)	SECONDARY/ J (EN 15804 +A2)	TERTIARY/ J (EN 15804 +A2)	WASHING PLANT/ J (EN 15804 +A2)	A4
	PM	Disease incidence	1,33E-06	1,33E-06	1,35E-06	1,40E-06	1,40E-06	0,00E+00
	IRP <sup>2</sup>	kgBq U235 -eq	8,59E-02	9,04E-02	1,01E-01	1,25E-01	1,38E-01	9,09E-01
	ETP-fw <sup>1</sup>	CTUe	8,94E+03	8,95E+03	8,95E+03	8,95E+03	8,96E+03	1,14E+02
	HTP-c <sup>1</sup>	CTUh	6,81E-10	7,35E-10	8,30E-10	1,04E-09	1,20E-09	0,00E+00
	HTP-nc <sup>1</sup>	CTUh	4,15E-08	4,27E-08	4,50E-08	4,99E-08	5,36E-08	0,00E+00
	SQP <sup>1</sup>	dimensionless	3,69E+00	3,81E+00	4,10E+00	4,79E+00	5,16E+00	2,73E+01











PM = Particulate Matter emissions; IRP = Ionizing radiation – human health; ETP-fw = Eco toxicity – freshwater; HTP-c = Human toxicity – cancer effects; HTP-nc = Human toxicity – non cancer effects; SQP = Potential Soil Quality Index (dimensionless)

"Reading example: 9,0 E-03 = 9,0\*10<sup>-3</sup> = 0,009"

\*INA Indicator Not Assessed

1. 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
2. This impact category deals mainly with the eventual impact of low dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator.






Resource use									
Indicator		Unit	QUARRY/ J (EN 15804 +A2)	PRIMARY/ J (EN 15804 +A2)	SECONDARY/ J (EN 15804 +A2)	TERTIARY/ J (EN 15804 +A2)	WASHING PLANT/ J (EN 15804 +A2)	A4	
	PERE	MJ	3,57E-01	3,55E+00	8,01E+00	1,73E+01	2,67E+01	1,23E+00	
	PERM	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	
	PERT	MJ	3,57E-01	3,55E+00	8,01E+00	1,73E+01	2,67E+01	1,23E+00	
	PENRE	MJ	2,40E+01	2,42E+01	2,55E+01	2,88E+01	2,95E+01	2,10E+02	
	PENRM	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	
	PENRT	MJ	2,41E+01	2,43E+01	2,56E+01	2,89E+01	2,96E+01	2,10E+02	
	SM	kg	3,36E-03	3,36E-03	3,36E-03	3,36E-03	3,36E-03	0,00E+00	
	RSF	MJ	8,50E-03	1,10E-02	1,46E-02	2,22E-02	2,96E-02	4,23E-02	
	NRSF	MJ	2,80E-02	3,43E-02	4,48E-02	6,79E-02	8,63E-02	3,66E-01	
	FW	m <sup>3</sup>	9,84E-03	3,37E-02	6,70E-02	1,36E-01	2,06E-01	7,65E-03	

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 resources; SM = Use of secondary materials; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Net use of fresh water

"Reading example: 9,0 E-03 = 9,0\*10<sup>-3</sup> = 0,009"

\*INA Indicator Not Assessed

### End of life - Waste






Indicator		Unit	QUARRY/ J (EN 15804 +A2)	PRIMARY/ J (EN 15804 +A2)	SECONDARY/ J (EN 15804 +A2)	TERTIARY/ J (EN 15804 +A2)	WASHING PLANT/ J (EN 15804 +A2)	A4
	HWD	kg	1,50E-02	1,51E-02	1,54E-02	1,59E-02	1,64E-02	7,64E-03
	NHWD	kg	8,17E-02	1,01E-01	1,28E-01	1,86E-01	2,42E-01	3,81E-01
	RWD	kg	1,33E-04	1,36E-04	1,45E-04	1,69E-04	1,76E-04	1,47E-03

HWD = Hazardous waste disposed; NHWD = Non-hazardous waste disposed; RWD = Radioactive waste disposed

"Reading example: 9,0 E-03 = 9,0\*10<sup>-3</sup> = 0,009"

\*INA Indicator Not Assessed

### End of life - Output flow

Indicator		Unit	QUARRY/ J (EN 15804 +A2)	PRIMARY/ J (EN 15804 +A2)	SECONDARY/ J (EN 15804 +A2)	TERTIARY/ J (EN 15804 +A2)	WASHING PLANT/ J (EN 15804 +A2)	A4
	CRU	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
	MFR	kg	6,97E-02	6,97E-02	6,97E-02	6,97E-02	6,97E-02	0,00E+00
	MER	kg	9,46E-05	9,46E-05	9,46E-05	9,46E-05	9,46E-05	0,00E+00
	EEE	MJ	2,00E-02	2,00E-02	2,00E-02	2,00E-02	2,00E-02	0,00E+00
	EET	MJ	3,03E-01	3,03E-01	3,03E-01	3,03E-01	3,03E-01	0,00E+00

CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported energy electrical; EET = Exported energy thermal

"Reading example: 9,0 E-03 = 9,0\*10<sup>-3</sup> = 0,009"

\*INA Indicator Not Assessed

### Biogenic Carbon Content

Indicator	Unit	At the factory gate
Biogenic carbon content in product	kg C	0,00E+00
Biogenic carbon content in accompanying packaging	kg C	0,00E+00

Note: 1 kg biogenic carbon is equivalent to 44/12 kg CO<sub>2</sub>

## Additional requirements

### Greenhouse gas emissions from the use of electricity in the manufacturing phase

National production mix from import, low voltage (production of transmission lines, in addition to direct emissions and losses in grid) of applied electricity for the manufacturing process (A3).

### Dangerous substances

The product contains no substances given by the REACH Candidate list or the Norwegian priority list.

### Indoor environment

## Additional Environmental Information






### Additional environmental impact indicators required in NPCR Part A for construction products

Indicator	Unit	QUARRY/ J (EN 15804 +A2)	PRIMARY/ J (EN 15804 +A2)	SECONDARY/ J (EN 15804 +A2)	TERTIARY/ J (EN 15804 +A2)	WASHING PLANT/ J (EN 15804 +A2)	A4
GWPIOBC	kg CO <sub>2</sub> -eq	2,23E+00	2,25E+00	2,35E+00	2,59E+00	2,64E+00	1,64E+01

GWPIOBC: Global warming potential calculated according to the principle of instantaneous oxidation. In order to increase the transparency of biogenic carbon contribution to climate impact, the indicator GWP-IOBC is required as it declares climate impacts calculated according to the principle of instantaneous oxidation. GWP-IOBC is also referred to as GWP-GHG in context to Swedish public procurement legislation.

## Bibliography

ISO 14025:2010 Environmental labels and declarations - Type III environmental declarations - Principles and procedures.  
 ISO 14044:2006 Environmental management - Life cycle assessment - Requirements and guidelines.  
 EN 15804:2012+A2:2019 Environmental product declaration - Core rules for the product category of construction products.  
 ISO 21930:2017 Sustainability in buildings and civil engineering works - Core rules for environmental product declarations of construction products.  
 ecoinvent v3, Allocation, cut-off by classification, Swiss Centre of Life Cycle Inventories.  
 Iversen et al., (2021) eEPD v2021.09 Background information for EPD generator tool system verification, LCA.no Report number: 07.21  
 Vold, M., and Iversen, O. M. K. (2022) EPD generator for for NPCR 018 Part B for natural stone products, aggregates and fillers  
 Background information for EPD generator application and LCA data, LCA.no report number: 09.22.  
 NPCR Part A: Construction products and services. Ver. 2.0, 24.03.2021 EPD Norway.  
 NPCR 018 Part B for natural stone products, aggregates and fillers, Ver. 1.1, 20.01.2022, EPD Norway.

 <b>epd-norway</b> <small>Global Program Operator</small>	<b>Program operator and publisher</b> The Norwegian EPD Foundation Post Box 5250 Majorstuen, 0303 Oslo, Norway	Phone: +47 23 08 80 00 e-mail: <a href="mailto:post@epd-norge.no">post@epd-norge.no</a> web: <a href="http://www.epd-norge.no">www.epd-norge.no</a>
	<b>Owner of the declaration:</b> Norsk Stein AS Jelsavegen 512, 4234 Jelsa	Phone: + 47 47 33 52 82 e-mail: <a href="mailto:skogland@mibau-stema.com">skogland@mibau-stema.com</a> web:
	<b>Author of the Life Cycle Assessment</b> LCA.no AS Dokka 6B, 1671	Phone: +47 916 50 916 e-mail: <a href="mailto:post@lca.no">post@lca.no</a> web: <a href="http://www.lca.no">www.lca.no</a>
	<b>Developer of EPD generator</b> LCA.no AS Dokka 6B,1671 Kråkerøy	Phone: +47 916 50 916 e-mail: <a href="mailto:post@lca.no">post@lca.no</a> web: <a href="http://www.lca.no">www.lca.no</a>
	ECO Platform ECO Portal	web: <a href="http://www.eco-platform.org">www.eco-platform.org</a> web: ECO Portal