

# Vulcan

## Materials Company

### WESTERN DIVISION



## Environmental Product Declaration

This Environmental Product Declaration (EPD) is for seven concrete aggregate products manufactured by Vulcan Materials Company at their Durbin Sand & Gravel facility in Irwindale, CA.

Vulcan Materials Company, Western Division  
500 North Brand Blvd.  
Suite 500  
Glendale, CA 91203-1923

# Vulcan Materials Company

## Environmental Product Declaration

### General Information

#### Environmental Product Declaration

This declaration has been prepared in accordance with ISO 14025, ISO 21930, and ASTM International's EPD program operator rules.

#### PCR review was conducted by:

Jamie Meil ▪ [jamie.meil@athenasmi.org](mailto:jamie.meil@athenasmi.org)

The PCR peer review report is available upon request: [cert@astm.org](mailto:cert@astm.org)

Independent verification of the declaration and data, according to ISO 14025:  internal  external

#### Third-party verifier:

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Industrial Ecology Consultants

35 Bracebridge Rd. ▪ Newton, MA 02459-1728

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#### Product Category Rule:

ASTM Product Category Rules (PCR) for Construction  
Aggregates: Natural Aggregate, Crushed Concrete, and Iron/Steel  
Furnace Slag, issued January, 2017.

**Declared Unit:** 1 metric ton (dry weight).

#### Program Operator:

ASTM International  
<http://www.astm.org/EPDs.htm>



#### EPD Owner:

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#### LCA and EPD Developer:

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#### Date of Issue:

June 22, 2020 (valid for 5 years until June 22, 2025)

**ASTM Declaration Number:** EPD-155

#### Products

The 7 concrete aggregates covered in this EPD are produced at:

Durbin Sand & Gravel  
13000 E Los Angeles Street  
Irwindale, CA 91706

Durbin is a dual bucket dredge quarry.

Each aggregate is compliant with the standards and specifications listed in Table 1.

**Table 1: Aggregates Covered in this Study**

Aggregate	Standards
1 1/2" (Washed Gravel 1 1/2")	ASTM C33, Caltrans sections 19 and 90, Greenbook section 200
1" (Washed Gravel 1")	ASTM C33, Caltrans sections 19 and 90, Greenbook section 200
3/8" (Washed Gravel 3/8")	ASTM C33, Caltrans sections 19, 68 and 90, Greenbook sections 200 and 217
Fill Rock	ASTM C33, Greenbook section 217
WCS (Washed Concrete Sand)	ASTM C33, Caltrans section 90, Greenbook section 200
WPS (Washed Plaster Sand)	ASTM C144, Greenbook section 200
Nursery (Nursery Sand)	ASTM D1073, Caltrans section 19, Greenbook section 217

#### Material Composition

The material composition of the aggregates covered in this study is 100% natural sand and gravel.

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**Washed Gravel 1 1/2" (1 1/2")**



A washed, coarse aggregate with a top size of 1.5". Typically used as a concrete aggregate, it is referred to as Caltrans 1.5" x 3/4", Greenbook size No.2, and ASTM C33 size #4. Also used in a variety of landscape, drainage and filtration applications including Caltrans Pervious Backfill and a substitute for Caltrans Class 4 Permeable in Austin Vaults.

**Washed Gravel 1" (1")**



A washed, coarse aggregate with a top size of 1". Typically used as a concrete aggregate, it is referred to as Caltrans 1" x #4, Greenbook size No.3, and ASTM C33 size #57. Also used in a variety of landscape, drainage and filtration applications including Caltrans Pervious Backfill.

**Washed Gravel 3/8" (3/8")**



A washed, coarse aggregate with a top size of 3/8". Typically used as a concrete aggregate, it is referred to as Caltrans 3/8" x #8, Greenbook size No.4, and ASTM C33 size #8. Also used in a variety of landscape, drainage and filtration applications including Greenbook and Caltrans Pervious Backfill and Caltrans Class 1 - Type A Permeable.

**Fill Rock**



A washed, fine gravel with 100% passing the 3/8" sieve that is primarily comprised of size #8 particles. Meets ASTM C33 size #9 and is commonly used in the production of blocks and pavers. Also used in a variety of landscape, drainage and filtration applications including Greenbook and Caltrans Pervious Backfill.

**Washed Concrete Sand (WCS)**



A washed, natural sand with 100% passing the 3/8" sieve that meets standard Caltrans, Greenbook and ASTM specifications for Washed Concrete Sand. Also used as the fine portion of a Permeable Base blend commonly used under synthetic turf athletic fields or water tanks.

**Washed Plaster Sand (WPS)**



A washed, natural sand with 100% passing the #4 sieve that meets standard Greenbook and ASTM specifications for Washed Plaster Sand (aka Mortar Sand).

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#### Nursery Sand (Nursery)



A washed, natural sand with 100% passing the #8 sieve that meets standard Greenbook and Caltrans specifications for Structure Backfill. Also used in a variety of landscape and nursery applications for its water retention characteristics.

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### LCA Study

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#### Study

##### System boundary

This study captures the following mandatory cradle-to-gate (A1-A3) life cycle product stages (as illustrated in Figure 1):

A1 - Extraction and processing of raw materials including fuels used in extraction and transport within the process;

A2 – Specific transportation of raw materials (including recycled materials) from extraction site or source to manufacturing site (including any recovered materials from source to be recycled in the process) and including empty backhauls and transportation to interim distribution centers or terminals;

A3 – Manufacturing of the product, including all energy and materials required and all emissions and wastes produced.

PRODUCTION Stage (Mandatory)			CONSTRUCTION Stage		USE Stage					END-OF-LIFE Stage			
Extraction and upstream production	Transport to factory	Manufacturing	Transport to site	Installation	Use	Maintenance	Repair	Replacement	Refurbishment	De-construction/Demolition	Transport to waste processing or disposal	Waste processing	Disposal of waste
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	C1	C2	C3	C4

**Figure 1. Life-Cycle Stages and Modules**

Except as noted above, all other life cycle stages as described in Figure 1 are excluded from the LCA study. The following processes are also excluded from the study:

1. Production, manufacture, and construction of manufacturing capital goods and infrastructure;
2. Production and manufacture of production equipment, delivery vehicles, and laboratory equipment;
3. Personnel-related activities (travel, furniture, office supplies);
4. Fuel used to transport personnel around the mine and sand & gravel facility;
5. Energy and water use related to company management and sales activities.

# Vulcan Materials Company

## Environmental Product Declaration

### LCA Study

The main processes included in the system boundary are illustrated in Figure 2.

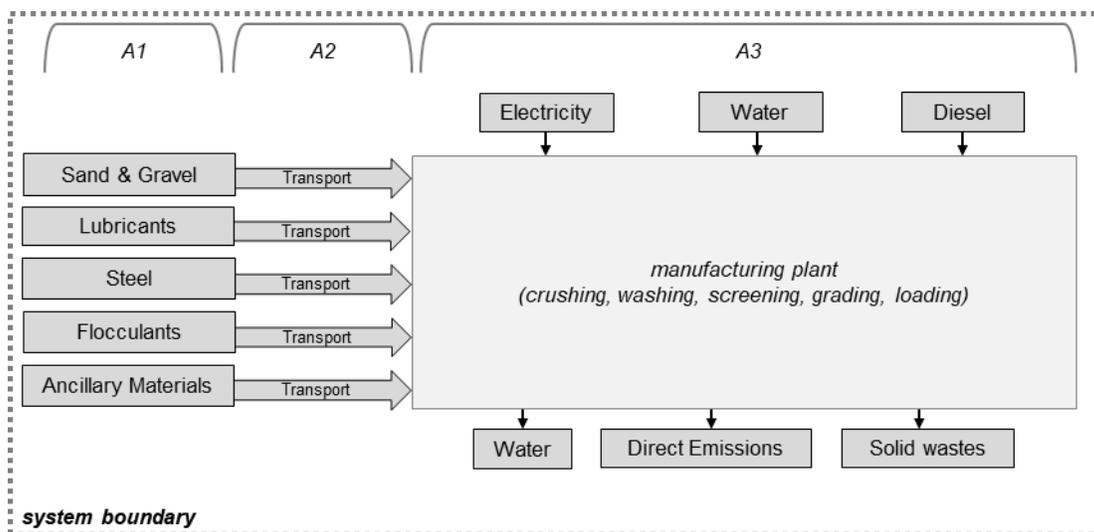


Figure 2. Main Processes Included in System Boundary

Electricity impacts are calculated based on the 2014 resource mix at the level of North American Electricity Reliability Council (NERC) WECC region. The 2014 grid mix contains: 29.2% Natural Gas, 22.6% Hydro, 14.3% Lignite, 13.9% Coal, 8.1% Nuclear, 6.6% Wind, 2.2% Geothermal, 1.7% BC import, 0.6% Wood Chips, 0.4% Biogas, 0.3% Solar.

Explanatory materials may be requested by contacting:

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# Vulcan Materials Company

## Environmental Product Declaration

### Environmental Impacts

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Cradle to Gate (A1-A3) impact results per 1 metric ton (dry weight) of product are outlined in Table 2 for each aggregate.

**Table 2: Cradle-to-Gate Impact Results for Aggregates Covered in Study**

Impact category	Unit	1 1/2"	1"	3/8"	Fill Rock	WCS	WPS	Nursery
Global warming potential	kg CO <sub>2</sub> eq	3.85	3.48	3.44	3.39	3.63	3.63	3.79
Acidification potential	kg SO <sub>2</sub> eq	0.021	0.021	0.021	0.020	0.021	0.021	0.022
Eutrophication potential	kg N eq	0.022	0.019	0.019	0.019	0.020	0.020	0.021
Smog creation potential	kg O <sub>3</sub> eq	0.54	0.54	0.54	0.53	0.56	0.56	0.56
Ozone depletion potential	kg CFC-11 eq	2.12E-07	1.83E-07	1.80E-07	1.76E-07	1.91E-07	1.92E-07	2.03E-07
Nonrenewable fossil	MJ	51.0	46.3	45.8	45.1	48.2	48.3	50.3
Nonrenewable nuclear	MJ	6.84	5.94	5.84	5.72	6.21	6.22	6.57
Renewable (biomass)	MJ	0.542	0.465	0.456	0.446	0.487	0.487	0.517
Renewable (solar, wind, hydroelectric, and geothermal)	MJ	7.57	6.49	6.37	6.23	6.79	6.80	7.22
Nonrenewable material resources	kg	1,000	1,000	1,000	1,000	1,000	1,000	1,000
Renewable material resources	kg	0.033	0.028	0.027	0.027	0.029	0.029	0.031
Net fresh water	m <sup>3</sup>	0.650	0.657	0.690	0.688	0.814	0.821	0.922
Non-hazardous waste generated	kg	0.069	0.070	0.070	0.070	0.072	0.072	0.073
Hazardous waste generated	kg	1.09E-05	1.10E-05	1.10E-05	1.10E-05	1.14E-05	1.14E-05	1.14E-05

This EPD only covers the cradle-to-gate impacts of aggregates using a declared unit and the results cannot be used to compare between products. EPDs from different programs (using different PCR) may not be comparable.

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#### Air Quality efforts

Vulcan implements pollution control devices including particulate filters, water sprays, and frequent watering of haul roads and stockpiles to control emissions to the air. Our unpaved haul roads are often treated with nonhazardous products as dust suppression to reduce water usage, in turn reducing overall vehicle exhaust emissions from our water trucks. We operate under permits granted by the South Coast Air Quality Management District. You can learn more about air quality operating requirements in the aggregates industry by visiting <https://www.aqmd.gov>

#### Water Management

Vulcan facilities re-use water extensively. Water used to produce our products is often captured for re-use to minimize our water usage footprint. Water we can't recapture is often placed in designated basins, where it seeps through the underlying soil to recharge local groundwater resources. The Durbin facility drains internally with stormwater draining to internal basins recharging local groundwater resources.

#### Mining and Reclamation

Mining and reclamation of our properties is conducted in conformance with established plans that are approved by local authorities, and performance bonded to ensure funding is available for reclamation when mining is complete. At our Durbin facility the plan is to backfill the former mining area to match the elevation of the surrounding area so that it can be used as industrial, commercial, or residential property in an area that has a high demand for building lots. The backfilled material consists of inert materials, such as concrete debris and uncontaminated soils from offsite construction projects, reducing the amount of debris unnecessarily filling municipal landfills.

#### Used Oil and Battery Recycling

Used oil and batteries from our locations are picked up by recycling vendors in accordance with State and Federal regulations. The used oil and batteries are then recycled by licensed facilities.

#### Sustainability

Our operations strive to reduce environmental impacts as much as possible, principally by reducing the use of or recycling resources as much as possible. We recycle our aggregate wash water to reduce fresh water consumption. We also limit our diesel-powered equipment to 5 minutes idling and have implemented a large-scale preventative maintenance program for diesel equipment to maximize efficiency.

#### Community

In addition to providing high quality aggregate to serve the needs of California's ever-expanding economy, Vulcan's objective is to build strong communities and be a good corporate partner. To this end, Vulcan established the Vulcan Materials Company Foundation to actively support many public and charitable projects. By working with area schools, supporting environmental education, wildlife habitat conservation and encouraging employee involvement, Vulcan has proven itself to be an asset to the communities where we operate. Our current priorities include: education programs, community event sponsorships, partnerships with land conservation organizations and establishing / maintaining certified wildlife habitats.

Some examples of Vulcan's commitment to the community in Durbin include support of the following organizations and events:

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- o Neighborhood Homework House
- o Royal Oaks STEAM Academy
- o Azusa High School
- o San Dimas High School
- o Baldwin Park Middle School Robotics Team
- o Azusa Pacific University
- o Citrus College Foundation
- o Magnolia Elementary School
- o Azusa Rotary Foundation
- o Irwindale Police Officers Association
- o Irwindale Education Foundation
- o Santa Anita Family YMCA
- o MEND Poverty