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
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:**

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The PCR peer review report is available upon request: cert@astm.org

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

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**Product Category Rule:**


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

**Program Operator:**

ASTM International

http://www.astm.org/EPDs.htm

**EPD Owner:**

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**Date of Issue:**

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

**ASTM Declaration Number:** EPD-155

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**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**

<table>
<thead>
<tr>
<th>Aggregate</th>
<th>Standards</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 1/2” (Washed Gravel 1 1/2”)</td>
<td>ASTM C33, Caltrans sections 19 and 90, Greenbook section 200</td>
</tr>
<tr>
<td>1” (Washed Gravel 1”)</td>
<td>ASTM C33, Caltrans sections 19 and 90, Greenbook section 200</td>
</tr>
<tr>
<td>3/8” (Washed Gravel 3/8”)</td>
<td>ASTM C33, Caltrans sections 19, 68 and 90, Greenbook sections 200 and 217</td>
</tr>
<tr>
<td>Fill Rock (Washed Concrete Sand)</td>
<td>ASTM C33, Greenbook section 217</td>
</tr>
<tr>
<td>WPS (Washed Plaster Sand)</td>
<td>ASTM C144, Greenbook section 200</td>
</tr>
<tr>
<td>Nursery (Nursery Sand)</td>
<td>ASTM D1073, Caltrans section 19, Greenbook section 217</td>
</tr>
</tbody>
</table>

**Material Composition**

The material composition of the aggregates covered in this study is 100% natural sand and gravel.
Washed Gravel 1 1/2” (1 1/2”)  
A washed, coarse aggregate with a topsize 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 topsize 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 topsize 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).
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.
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.

<table>
<thead>
<tr>
<th>PRODUCTION Stage (Mandatory)</th>
<th>CONSTRUCTION Stage</th>
<th>USE Stage</th>
<th>END-OF-LIFE Stage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extraction and upstream production</td>
<td>Transport to factory</td>
<td>Installation</td>
<td>Use</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>Transport to site</td>
<td>Maintenance</td>
<td>Repair</td>
</tr>
<tr>
<td>A1</td>
<td>A2</td>
<td>A3</td>
<td>A4</td>
</tr>
</tbody>
</table>

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

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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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

<table>
<thead>
<tr>
<th>Impact category</th>
<th>Unit</th>
<th>1 1/2”</th>
<th>1”</th>
<th>3/8”</th>
<th>Fill Rock</th>
<th>WCS</th>
<th>WPS</th>
<th>Nursery</th>
</tr>
</thead>
<tbody>
<tr>
<td>Global warming potential</td>
<td>kg CO₂ eq</td>
<td>3.85</td>
<td>3.48</td>
<td>3.44</td>
<td>3.39</td>
<td>3.63</td>
<td>3.63</td>
<td>3.79</td>
</tr>
<tr>
<td>Acidification potential</td>
<td>kg SO₂ eq</td>
<td>0.021</td>
<td>0.021</td>
<td>0.021</td>
<td>0.020</td>
<td>0.021</td>
<td>0.021</td>
<td>0.022</td>
</tr>
<tr>
<td>Eutrophication potential</td>
<td>kg N eq</td>
<td>0.022</td>
<td>0.019</td>
<td>0.019</td>
<td>0.019</td>
<td>0.020</td>
<td>0.020</td>
<td>0.021</td>
</tr>
<tr>
<td>Smog creation potential</td>
<td>kg O₃ eq</td>
<td>0.54</td>
<td>0.54</td>
<td>0.54</td>
<td>0.53</td>
<td>0.56</td>
<td>0.56</td>
<td>0.56</td>
</tr>
<tr>
<td>Ozone depletion potential</td>
<td>kg CFC-11 eq</td>
<td>2.12E-07</td>
<td>1.83E-07</td>
<td>1.80E-07</td>
<td>1.76E-07</td>
<td>1.91E-07</td>
<td>1.92E-07</td>
<td>2.03E-07</td>
</tr>
<tr>
<td>Nonrenewable fossil</td>
<td>MJ</td>
<td>51.0</td>
<td>46.3</td>
<td>45.8</td>
<td>45.1</td>
<td>48.2</td>
<td>48.3</td>
<td>50.3</td>
</tr>
<tr>
<td>Nonrenewable nuclear</td>
<td>MJ</td>
<td>6.84</td>
<td>5.94</td>
<td>5.84</td>
<td>5.72</td>
<td>6.21</td>
<td>6.22</td>
<td>6.57</td>
</tr>
<tr>
<td>Renewable (biomass)</td>
<td>MJ</td>
<td>0.542</td>
<td>0.465</td>
<td>0.456</td>
<td>0.446</td>
<td>0.487</td>
<td>0.487</td>
<td>0.517</td>
</tr>
<tr>
<td>Renewable (solar, wind, hydroelectric, and geothermal)</td>
<td>MJ</td>
<td>7.57</td>
<td>6.49</td>
<td>6.37</td>
<td>6.23</td>
<td>6.79</td>
<td>6.80</td>
<td>7.22</td>
</tr>
<tr>
<td>Nonrenewable material resources</td>
<td>kg</td>
<td>1,000</td>
<td>1,000</td>
<td>1,000</td>
<td>1,000</td>
<td>1,000</td>
<td>1,000</td>
<td>1,000</td>
</tr>
<tr>
<td>Renewable material resources</td>
<td>kg</td>
<td>0.033</td>
<td>0.028</td>
<td>0.027</td>
<td>0.027</td>
<td>0.029</td>
<td>0.029</td>
<td>0.031</td>
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<tr>
<td>Net fresh water</td>
<td>m³</td>
<td>0.650</td>
<td>0.657</td>
<td>0.690</td>
<td>0.688</td>
<td>0.814</td>
<td>0.821</td>
<td>0.922</td>
</tr>
<tr>
<td>Non-hazardous waste generated</td>
<td>kg</td>
<td>0.069</td>
<td>0.070</td>
<td>0.070</td>
<td>0.070</td>
<td>0.072</td>
<td>0.072</td>
<td>0.073</td>
</tr>
<tr>
<td>Hazardous waste generated</td>
<td>kg</td>
<td>1.09E-05</td>
<td>1.10E-05</td>
<td>1.10E-05</td>
<td>1.10E-05</td>
<td>1.14E-05</td>
<td>1.14E-05</td>
<td>1.14E-05</td>
</tr>
</tbody>
</table>

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.
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:
Vulcan Materials Company
Environmental Product Declaration
Additional Environmental Information

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