



Environmental Product Declaration

This document is a product-specific Type III Environmental Product Declaration (EPD) for sixty-four aggregates produced at six Martin Marietta Rocky Mountain Division facilities.

Martin Marietta
2710 Wycliff Road, Raleigh, NC 27607
919-781-4550 • <http://www.martinmarietta.com>

Environmental Product Declaration

General Information

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

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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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Date of Issue:

August 1, 2017 (valid for 5 years until August 1, 2022).

ASTM Declaration Number: EPD-063

Product system

The product systems investigated by this study are sand and gravel aggregates for use in construction materials. These products are compliant to the following standards and specifications:

- ASTM C33/C33M-13 – Concrete aggregates
- D2940/D2940M-15 – Graded aggregate material for bases or subbases for highways or airports
- D692/D692M-15 – Course aggregate for bituminous paving mixtures
- ASTM D6155-13 Nontraditional coarse aggregates for bituminous paving mixtures
- D1139/D1139M-15 Aggregate for single or multiple bituminous surface treatments
- D1073-11 - Fine aggregate for bituminous paving mixtures
- D4992-14e1 – Rock to be used for erosion control

Locations

The sixty-four aggregates covered in this EPD are produced at the following locations:

Specifications Aggregates Quarry
18401 West Colfax Ave
Golden, Colorado 80401

Riverbend Sand and Gravel
12673 County Road 6
Brighton, Colorado 80603

Granite Canyon Quarry
636 I-80 Service Road
Granite Canyon, Wyoming 82059

Spanish Springs Quarry
11059 State Route 445
Sparks, Nevada 89441

Parkdale Quarry
112 County Road 157
Cañon City, Colorado 81212

Drennan Yard
3655 Out West Drive
Colorado Springs, Colorado 80910

Material Composition

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



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Product Information

Products

Table 1: Aggregates Covered in this Study

Facility	Item Code	Name	Standards	Application	
Specifications Aggregates	3562	BALLAST AREMA GR 4	ASTM C33/C33M-13	Railroad ballast, vehicle traction control, leach fields, stabilization, dewatering, landscaping	Appendix A-Image 1
	4531	CDOT CLASS 6 BASE	D2940/D2940M-15	Base course for roadways, gravel roadway surfacing, parking lot coverage, driveway surfacing backfill	Appendix A-Image 2
	4561	CLS 5 - 1-1/2 ROAD BASE	D2940/D2940M-15	Driveways, parking lots, structural fill	Appendix A-Image 3
	4562	CLASS 1 CRUSHER FINES	D2940/D2940M-15	Backfill for MSE walls, foundations, retaining walls, base of berms	Appendix A-Image 4
	4564	STRUCTURAL FILL - CLASS1	D2940/D2940M-15	Backfill for walls foundations, walls and structures. Base of berms	Appendix A-Image 5
	4567	TYPE H RIP RAP D/50=18	D4992-14e1	Urban drainage flood control, erosion control, landscaping, retaining walls, slope protection, rock plating	Appendix A-Image 6
	4568	TYPE M RIP RAP D/50=12	D4992-14e1	Urban drainage flood control, erosion control, landscaping, retaining walls, slope protection, rock plating	Appendix A-Image 7
	4569	TYPE L RIP RAP D/50=9	D4992-14e1	Urban drainage flood control, erosion control, landscaping, retaining walls, slope protection, rock plating	Appendix A-Image 8
	4574	TYPE VL RIP RAP D/50=6	D4992-14e1	Urban drainage flood control, erosion control, landscaping, retaining walls, slope protection, rock plating	Appendix A-Image 9
	4576	57/67 CRUSHED ROCK	ASTM C33/C33M-13, ASTM D6155-13, D692.D692M-15, D1139/D1139M-15	Concrete and asphalt mixes, bedding, drainage and filtration, landscaping, erosion control, driveway and ground cover	Appendix A-Image 10
	4577	1 - 1/2	ASTM D6155-13, D692/D692M-15	Drainage and filtration, vehicle tracking, erosion control, landscaping, leach fields, rip rap bedding	Appendix A-Image 11
	6822	57/67 CRUSHED ROCK - WASHED	ASTM C33/C33M-13	Concrete and asphalt mixes, bedding, drainage and filtration, landscaping, erosion control, driveway and ground cover	Appendix A-Image 12

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Facility	Item Code	Name	Standards	Application	
Riverbend	1309	MASONRY SAND	ASTM C33/C33M-13	Mortar and stucco, volleyball courts, horse arenas, sand boxes, concrete mixes, bedding material, drainage and filtration, playgrounds	Appendix B-Image 1
	4505	CLS 6 RECYCLED CONCRETE BASE	D2940/D2940M-15	Class 6 Recycled Concrete Base is produced from 100% post-consumer concrete. The material is screened to meet CDOT Class 6 specifications with 100% passing ¾". This product is highly compactable and performs well in inclement weather. Used for roads, driveways, parking lots, stabilization, backfill, concrete and asphalt paving.	Appendix B-Image 2
	4515	SQUEEGE - 3/8	ASTM C33/C33M-13, D1073-11	Concrete mixes, bedding, pathways, playgrounds, dog runs, parking areas, ice controls, drainage and filtration	Appendix B-Image 3
	4517	1-1/2 WASHED	ASTM C33/C33M-13	Landscaping, portland cement concrete, bedding, roofing, stabilization, drainage and filtration, leach fields, erosion control	Appendix B-Image 4
	4518	57/67 WASHED ROCK	ASTM C33/C33M-13, ASTM D6155-13, D692.D692M-15, D1139/D1139M-15	Concrete mixes, bedding, pathways, driving surfaces, landscaping, erosion control, drainage and filtration	Appendix B-Image 5
	4524	3/8" PEA GRAVEL (3/8" X #8)	ASTM C33/C33M-13	Concrete, fiberglass tanks, bedding, pathways, playgrounds, dog runs, parking areas	Appendix B-Image 6
	4528	CONCRETE SAND-ASTM C33	ASTM C33/C33M-13, D1073-11	Concrete and asphalt fine aggregate, bedding, drainage and filtration material	Appendix B-Image 7
	4554	CRUSHED SQUEEGEE	D1073-11	Asphalt mix material, Denver waste water bedding	Appendix B-Image 8
	4595	PIPE BEDDING A/B	D2940/D2940M-15	Bedding	Appendix B-Image 9
	6168	4 IN MINUS RECYCLED CONCRETE	D4992-14e1	Ballast, base course, bedding	Appendix B-Image 10
	6180	1-1/2 HP BASE	D2940/D2940M-15	Oil and gas road and pad construction, driveways and parking lots, structural fill	Appendix B-Image 11
	6267	#89 RM Blend	ASTM C33/C33M-13	Used in concrete mixtures	Appendix B-Image 12

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Facility	Item Code	Name	Standards	Application	
Granite Canyon	1388	3/8 X #4 CC	ASTM D6155-13	Chip seal	Appendix C-Image 1
	1747	1/2 ASP	D692/D692M-15	Asphalt rock, pipe bedding, landscaping	Appendix C-Image 2
	2524	BASE	D2940/D2940M-15	Roads, under slap material, fill, driveways, oil field pads	Appendix C-Image 3
	2871	57/67M/KDOTPCCM	ASTM C33/C33M-13, ASTM D6155-13, D692.D692M-15, D1139/D1139M-15	Asphalt stone, concrete stone, pipe bedding, landscaping	Appendix C-Image 4
	3562	BALLAST AREMA GR 4	ASTM C33/C33M-13	Railroad ballast, landscaping, sub stations	Appendix C-Image 5
	401	BALLAST	D4992-14e1	Railroad ballast, VTC tracking material, landscaping	Appendix C-Image 6
	4505	Class 6	D2940/D2940M-15	Roads, under slap material, fill, driveways, oil field pads	Appendix C-Image 7
	627	NB 47-B CO	ASTM C33/C33M-13	Concrete stone, landscaping	Appendix C-Image 8
	6818	1/2 WASHED	ASTM D6155-13	Asphalt stone, pipe bedding, landscaping	Appendix C-Image 9
	739	3/4 ASPHALT ST	D692/D692M-15	Asphalt stone, concrete stone, pipe bedding, landscaping	Appendix C-Image 10
	952	F-1 SAND	D1073-11	Asphalt fines, pipe bedding, structural fill, sanding for highways	Appendix C-Image 11
	965	SCGS	D1073-11	Asphalt fines, structural fill	Appendix C-Image 12

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Facility	Item Code	Name	Standards	Application	
Spanish Springs	1335	1 1/2 DRAIN ROCK	D4992-14e1	Construction, Landscaping, Rip Rap Bedding, Drainage and Filtration, Bedding	Appendix D-Image 1
	1350	1/2 AC ROCK	ASTM D6155-13	Used for Asphalt Mixes, Backfill Material, Landscaping	Appendix D-Image 2
	1369	3/4 AC ROCK	ASTM D6155-13	Used for Asphalt Mixes, Drain Rock Backfill	Appendix D-Image 3
	1371	3/4 CLASS II AB	D2940/D2940M-15	Walkways, bedding, landscaping, fill, base course for roadways, roadway surfacing	Appendix D-Image 4
	1372	3/4 DRAIN ROCK	D4992-14e1	Walkways, bedding, landscaping	Appendix D-Image 5
	1420	AC SAND	D692/D692M-15	Asphalt Mixes	Appendix D-Image 6
	1421	AC SAND WASHED	D1073-11	Asphalt Mixes	Appendix D-Image 7
	1477	GABION 3X8	D4992-14e1	Rock Gardens, Landscaping	Appendix D-Image 8
	1774	SPPCO SAND	D1073-11	Utility work, tank fill, select backfill, under pavers and flagstone, playgrounds, ice control, drainage	Appendix D-Image 9
	38	8STONE	ASTM C33/C33M-13	Concrete Materials, Walkways, Rock Gardens, Driving Surfaces, Landscaping	Appendix D-Image 10
	3879	AC 7/8	ASTM D6155-13	Asphalt and Concrete Mixes	Appendix D-Image 11
	718	3/4 CONC ST	ASTM C33/C33M-13	Used for Concrete Mixes, Drain Rock Backfill, Landscaping	Appendix D-Image 12

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Facility	Item Code	Name	Standards	Application	
Parkdale	1446	C-33 CONC SAND	ASTM C33/C33M-13	Concrete and asphalt fine aggregate, bedding, drainage and filtration material	Appendix E-Image 1
	1873	#6 STONE	ASTM C33/C33M-13	Concrete and asphalt mixes, bedding, drainage and filtration, landscaping, erosion control, driveway and ground cover	Appendix E-Image 2
	1876	#7 STONE	ASTM C33/C33M-13	Concrete and asphalt mixes, bedding, drainage and filtration, landscaping, erosion control, driveway and ground cover	Appendix E-Image 3
	2576	57 WASHED	ASTM C33/C33M-13	Concrete and asphalt mixes, bedding, drainage and filtration, landscaping, erosion control, driveway and ground cover	Appendix E-Image 4
	405	ASTM 4	ASTM C33/C33M-13	Railroad ballast, vehicle traction control, leach fields, stabilization, dewatering, landscaping	Appendix E-Image 5
	4518	57/67 WASHED ROCK	ASTM C33/C33M-13	Concrete and asphalt mixes, bedding, drainage and filtration, landscaping, erosion control, driveway and ground cover	Appendix E-Image 6
	4560	CRUSHER FINES	D1073-11	Backfill for MSE walls, foundations, retaining walls, base of berms	Appendix E-Image 7
	6801	#67 WASHED ROCK	ASTM C33/C33M-13	Concrete and asphalt mixes, bedding, drainage and filtration, landscaping, erosion control, driveway and ground cover	Appendix E-Image 8

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Facility	Item Code	Name	Standards	Application	
Drennan Yard ¹	1446	C-33 CONC SAND	ASTM C33/C33M-13	Concrete and asphalt fine aggregate, bedding, drainage and filtration material	Appendix F-Image 1
	1873	#6 STONE	ASTM C33/C33M-13	Concrete and asphalt mixes, bedding, drainage and filtration, landscaping, erosion control, driveway and ground cover	Appendix F-Image 2
	1876	#7 STONE	ASTM C33/C33M-13	Concrete and asphalt mixes, bedding, drainage and filtration, landscaping, erosion control, driveway and ground cover	Appendix F-Image 3
	2576	57 WASHED	ASTM C33/C33M-13	Concrete and asphalt mixes, bedding, drainage and filtration, landscaping, erosion control, driveway and ground cover	Appendix F-Image 4
	405	ASTM 4	ASTM C33/C33M-13	Railroad ballast, vehicle traction control, leach fields, stabilization, dewatering, landscaping	Appendix F-Image 5
	4518	57/67 WASHED ROCK	ASTM C33/C33M-13	Concrete and asphalt mixes, bedding, drainage and filtration, landscaping, erosion control, driveway and ground cover	Appendix F-Image 6
	4560	CRUSHER FINES	D1073-11	Backfill for MSE walls, foundations, retaining walls, base of berms	Appendix F-Image 7
	6801	#67 WASHED ROCK	ASTM C33/C33M-13	Concrete and asphalt mixes, bedding, drainage and filtration, landscaping, erosion control, driveway and ground cover	Appendix F-Image 8

¹ Drennan Yard sells aggregates produced at Parkdale. Parkdale aggregates are shipped by rail to Drennan Yard.

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LCA Study

This study is a cradle-to-gate life cycle assessment of sixty-four aggregates produced at six Martin Marietta Rocky Mountain Division facilities.

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.

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LCA Study

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

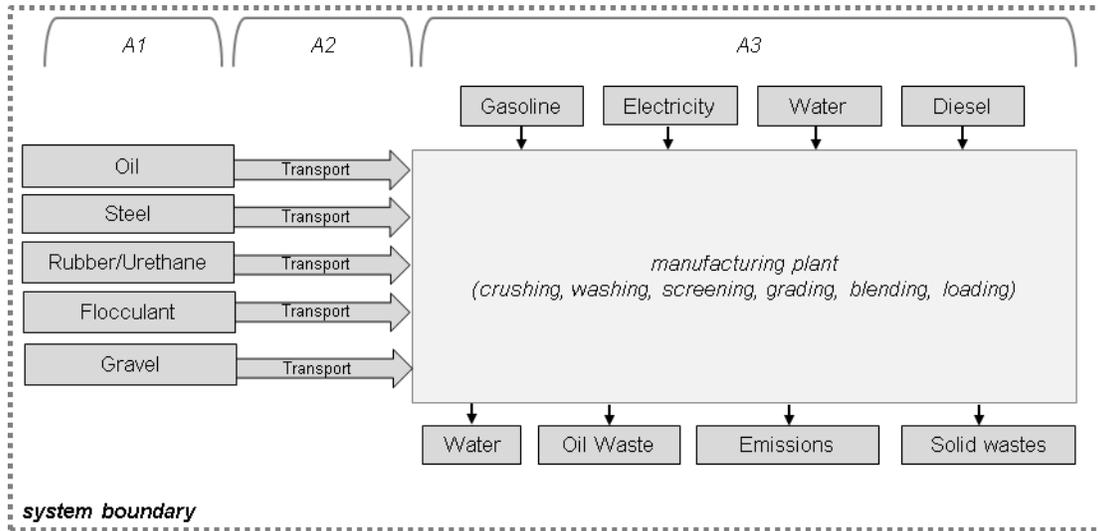


Figure 2. Main Processes Included in System Boundary

Life Cycle Inventory

Electricity impacts are calculated based on the 2012 resource mix at the level of North American Electricity Reliability Council (NERC) WECC region. The 2015 grid mix contains: 27.2% coal, 25.7% hydro, 28.4% natural gas, 8% nuclear, 5% solar, 2% geothermal.

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Environmental Impacts

Cradle to Gate (A1-A3) impact results per 1 metric ton (dry weight) of product are outlined in Tables 2-7 below for each Martin Marietta Rocky Mountain Division facility.

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.

Explanatory materials may be requested by contacting:

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Environmental Impacts – Specifications Aggregates

Table 2: Cradle-to-Gate (A1-A3) Impact Results for Specification Aggregate’s Aggregates Covered in Study. Results per Metric Ton (Dry Weight).

Facility: Specifications Aggregates Quarry													
Impact Category	Unit	3562	4531	4561	4562	4564	4567	4568	4569	4574	4576	4577	6822
Global warming potential	kg CO ₂ eq	2.88	2.27	2.29	2.92	3.08	2.09	2.09	2.09	2.15	2.87	2.86	3.34
Acidification potential	kg SO ₂ eq	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
Eutrophication potential	kg N eq	9.4E-03	4.3E-03	4.3E-03	9.6E-03	1.1E-02	3.2E-03	3.2E-03	3.2E-03	3.6E-03	9.4E-03	9.4E-03	0.01
Smog creation potential	kg O ₃ eq	0.82	0.82	0.83	0.83	0.84	0.80	0.80	0.80	0.80	0.82	0.82	0.84
Ozone depletion potential	kg CFC-11 eq	1.1E-07	4.2E-08	4.3E-08	1.1E-07	1.3E-07	2.8E-08	2.8E-08	2.8E-08	3.4E-08	1.1E-07	1.1E-07	1.6E-07
Nonrenewable fossil	MJ	40.6	32.7	33.0	41.1	43.2	30.4	30.4	30.4	31.1	40.4	40.3	46.6
Nonrenewable nuclear	MJ	2.78	1.10	1.11	2.82	3.22	0.75	0.75	0.75	0.89	2.77	2.76	3.95
Renewable (biomass)	MJ	0.23	0.08	0.08	0.24	0.27	0.04	0.04	0.04	0.06	0.23	0.23	0.34
Renewable (solar, wind, hydroelectric, and geothermal)	MJ	2.76	0.74	0.75	2.80	3.28	0.33	0.33	0.33	0.50	2.75	2.74	4.15
Nonrenewable material resources	kg	1,000	1	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
Renewable material resources	kg	1.4E-02	4.4E-03	4.5E-03	1.4E-02	1.6E-02	2.5E-03	2.5E-03	2.5E-03	3.3E-03	1.4E-02	1.4E-02	0.02
Net fresh water	L	0.06	0.08	0.09	0.07	0.08	0.05	0.05	0.05	0.05	0.05	0.05	0.07
Non-hazardous waste generated	kg	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Hazardous waste generated	kg	7.9E-05	3.4E-05	3.5E-05	8.0E-05	9.1E-05	2.5E-05	2.5E-05	2.5E-05	2.8E-05	7.9E-05	7.8E-05	1.1E-04

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Environmental Impacts – Riverbend Sand and Gravel

Table 3: Cradle-to-Gate (A1-A3) Impact Results for Riverbend’s Aggregates Covered in Study. Results per Metric Ton (Dry Weight).

Facility: Riverbend Sand and Gravel													
Impact Category	Unit	1309	4505	4515	4517	4518	4524	4528	4554	4595	6168	6180	6267
Global warming potential	kg CO ₂ eq	2.72	1.80	2.62	2.59	2.62	2.68	2.78	2.96	1.99	1.57	6.58	2.62
Acidification potential	kg SO ₂ eq	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.05	0.02
Eutrophication potential	kg N eq	1.2E-02	4.1E-03	1.1E-02	1.1E-02	1.1E-02	1.1E-02	1.2E-02	1.4E-02	6.3E-03	2.5E-03	1.2E-02	0.01
Smog creation potential	kg O ₃ eq	0.60	0.58	0.57	0.57	0.57	0.59	0.61	0.59	0.55	0.56	1.51	0.57
Ozone depletion potential	kg CFC-11 eq	1.4E-07	4.1E-08	1.3E-07	1.3E-07	1.3E-07	1.4E-07	1.4E-07	1.7E-07	7.0E-08	1.9E-08	1.3E-07	1.3E-07
Nonrenewable fossil	MJ	37.7	25.8	36.3	35.8	36.3	37.1	38.4	40.7	28.1	22.8	96.1	36.3
Nonrenewable nuclear	MJ	3.52	1.09	3.39	3.35	3.39	3.47	3.59	4.21	1.80	0.55	3.31	3.39
Renewable (biomass)	MJ	0.32	0.09	0.30	0.30	0.30	0.31	0.32	0.38	0.16	0.04	0.28	0.30
Renewable (solar, wind, hydroelectric, and geothermal)	MJ	3.92	1.01	3.78	3.73	3.77	3.86	4.00	4.74	1.88	0.37	3.40	3.77
Nonrenewable material resources	kg	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
Renewable material resources	kg	1.9E-02	5.2E-03	1.8E-02	1.8E-02	1.8E-02	1.9E-02	1.9E-02	2.3E-02	9.2E-03	2.2E-03	1.7E-02	0.02
Net fresh water	L	0.15	0.16	0.11	0.10	0.10	0.13	0.17	0.12	0.11	0.14	0.12	0.10
Non-hazardous waste generated	kg	0.04	0.04	0.03	0.03	0.03	0.04	0.04	0.04	0.03	0.04	0.08	0.03
Hazardous waste generated	kg	9.2E-05	2.7E-05	8.9E-05	8.8E-05	8.9E-05	9.1E-05	9.4E-05	1.1E-04	4.6E-05	1.3E-05	8.9E-05	8.9E-05

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LCA Study

Environmental Impacts – Granite Canyon

Table 4: Cradle-to-Gate (A1-A3) Impact Results Granite Canyon's Aggregates Covered in Study. Results per Metric Ton (Dry Weight).

Facility: Granite Canyon Quarry													
Impact Category	Unit	1388	1747	2524	2871	3562	401	4505	627	6818	739	952	965
Global warming potential	kg CO ₂ eq	3.59	3.59	3.93	4.44	3.50	3.71	3.79	3.59	4.44	3.50	4.63	3.56
Acidification potential	kg SO ₂ eq	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
Eutrophication potential	kg N eq	1.1E-02	1.1E-02	1.3E-02	1.8E-02	1.0E-02	1.2E-02	1.3E-02	1.1E-02	1.8E-02	1.0E-02	1.8E-02	0.01
Smog creation potential	kg O ₃ eq	1.05	1.05	1.09	1.07	1.05	1.05	1.05	1.05	1.07	1.05	1.12	1.06
Ozone depletion potential	kg CFC-11 eq	1.4E-07	1.4E-07	1.6E-07	2.3E-07	1.3E-07	1.5E-07	1.6E-07	1.4E-07	2.3E-07	1.3E-07	2.4E-07	1.3E-07
Nonrenewable fossil	MJ	51.4	51.4	55.9	62.3	50.2	52.9	54.0	51.4	62.3	50.2	65.1	51.0
Nonrenewable nuclear	MJ	3.32	3.32	3.97	5.49	3.08	3.61	3.84	3.32	5.49	3.08	5.74	3.18
Renewable (biomass)	MJ	0.28	0.28	0.34	0.48	0.26	0.31	0.33	0.28	0.48	0.26	0.50	0.27
Renewable (solar, wind, hydroelectric, and geothermal)	MJ	3.13	3.13	3.87	5.72	2.84	3.48	3.75	3.13	5.72	2.84	5.98	2.95
Nonrenewable material resources	kg	1,000	1,000	1	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
Renewable material resources	kg	1.6E-02	1.6E-02	2.0E-02	2.9E-02	1.5E-02	1.8E-02	1.9E-02	1.6E-02	2.9E-02	1.5E-02	3.0E-02	0.02
Net fresh water	L	0.10	0.10	0.14	0.11	0.10	0.10	0.13	0.10	0.11	0.10	0.16	0.11
Non-hazardous waste generated	kg	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12
Hazardous waste generated	kg	9.5E-05	9.5E-05	1.1E-04	1.5E-04	8.8E-05	1.0E-04	1.1E-04	9.5E-05	1.5E-04	8.8E-05	1.6E-04	9.1E-05

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Environmental Impacts – Spanish Springs

Table 5: Cradle-to-Gate (A1-A3) Impact Results for Spanish Springs' Aggregates Covered in Study. Results per Metric Ton (Dry Weight).

Facility: Spanish Springs Quarry													
Impact Category	Unit	1335	1350	1369	1371	1372	1420	1421	1477	1774	38	3879	718
Global warming potential	kg CO ₂ eq	4.47	7.70	7.70	4.07	4.49	5.93	4.61	2.87	5.02	4.52	4.49	4.49
Acidification potential	kg SO ₂ eq	0.04	0.05	0.05	0.04	0.04	0.05	0.04	0.04	0.04	0.04	0.04	0.04
Eutrophication potential	kg N eq	1.7E-02	4.3E-02	4.3E-02	1.3E-02	1.8E-02	2.9E-02	1.8E-02	5.0E-03	2.1E-02	1.8E-02	1.8E-02	0.02
Smog creation potential	kg O ₃ eq	1.10	1.20	1.20	1.13	1.10	1.15	1.13	1.04	1.17	1.11	1.10	1.10
Ozone depletion potential	kg CFC-11 eq	2.1E-07	5.5E-07	5.5E-07	1.6E-07	2.2E-07	3.7E-07	2.2E-07	5.0E-08	2.6E-07	2.2E-07	2.2E-07	2.2E-07
Nonrenewable fossil	MJ	64.4	106.3	106.3	59.6	64.8	83.4	66.5	43.7	72.0	65.1	64.8	64.8
Nonrenewable nuclear	MJ	5.01	13.37	13.37	3.62	5.04	8.73	5.17	0.96	6.03	5.06	5.04	5.04
Renewable (biomass)	MJ	0.44	1.22	1.22	0.30	0.44	0.78	0.45	0.06	0.53	0.44	0.44	0.44
Renewable (solar, wind, hydroelectric, and geothermal)	MJ	5.26	15.23	15.23	3.56	5.28	9.69	5.42	0.42	6.42	5.31	5.28	5.28
Nonrenewable material resources	kg	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
Renewable material resources	kg	2.6E-02	7.3E-02	7.3E-02	1.8E-02	2.6E-02	4.7E-02	2.7E-02	3.3E-03	3.1E-02	2.6E-02	2.6E-02	0.03
Net fresh water	L	0.10	0.12	0.12	0.15	0.11	0.12	0.13	0.08	0.17	0.11	0.11	0.11
Non-hazardous waste generated	kg	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Hazardous waste generated	kg	1.4E-04	3.6E-04	3.6E-04	1.0E-04	1.4E-04	2.4E-04	1.4E-04	3.0E-05	1.7E-04	1.4E-04	1.4E-04	1.4E-04

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Environmental Impacts – Parkdale

Table 6: Cradle-to-Gate (A1-A3) Impact Results for Parkdale’s Aggregates Covered in Study. Results per Metric Ton (Dry Weight).

Facility: Parkdale Quarry									
Impact Category	Unit	1446	1873	1876	2576	405	4518	4560	6801
Global warming potential	kg CO ₂ eq	2.76	2.14	2.14	2.55	2.14	2.56	2.14	2.56
Acidification potential	kg SO ₂ eq	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Eutrophication potential	kg N eq	1.2E-02	7.8E-03	7.8E-03	1.1E-02	7.8E-03	1.1E-02	7.8E-03	1.1E-02
Smog creation potential	kg O ₃ eq	0.61	0.55	0.55	0.56	0.55	0.56	0.55	0.56
Ozone depletion potential	kg CFC-11 eq	1.6E-07	1.0E-07	1.0E-07	1.5E-07	1.0E-07	1.5E-07	1.0E-07	1.5E-07
Nonrenewable fossil	MJ	39.0	30.7	30.7	36.0	30.7	36.1	30.7	36.1
Nonrenewable nuclear	MJ	3.72	2.40	2.40	3.44	2.40	3.45	2.40	3.45
Renewable (biomass)	MJ	0.33	0.21	0.21	0.30	0.21	0.30	0.21	0.30
Renewable (solar, wind, hydroelectric, and geothermal)	MJ	3.91	2.38	2.38	3.61	2.38	3.62	2.38	3.62
Nonrenewable material resources	kg	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
Renewable material resources	kg	1.9E-02	1.2E-02	1.2E-02	1.8E-02	1.2E-02	1.8E-02	1.2E-02	1.8E-02
Net fresh water	L	0.17	0.07	0.07	0.08	0.07	0.09	0.07	0.09
Non-hazardous waste generated	kg	0.09	0.08	0.08	0.08	0.08	0.08	0.08	0.08
Hazardous waste generated	kg	1.1E-04	7.0E-05	7.0E-05	9.7E-05	7.0E-05	9.8E-05	7.0E-05	9.8E-05

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Environmental Impacts – Drennan Yard

Table 21: Cradle-to-Gate (A1-A3) Impact Results for Drennan Yard’s Aggregates Covered in Study. Results per Metric Ton (Dry Weight).

Facility: Drennan Yard									
Impact Category	Unit	1446	1873	1876	2576	405	4518	4560	6801
Global warming potential	kg CO ₂ eq	5.52	5.16	5.16	5.31	5.16	5.32	5.16	5.31
Acidification potential	kg SO ₂ eq	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
Eutrophication potential	kg N eq	1.3E-02	1.1E-02	1.1E-02	1.2E-02	1.1E-02	1.2E-02	1.1E-02	1.2E-02
Smog creation potential	kg O ₃ eq	0.86	0.80	0.80	0.81	0.80	0.81	0.80	0.81
Ozone depletion potential	kg CFC-11 eq	2.1E-07	1.9E-07	1.9E-07	2.0E-07	1.9E-07	2.0E-07	1.9E-07	2.0E-07
Nonrenewable fossil	MJ	49.2	44.5	44.5	46.3	44.5	46.4	44.5	46.3
Nonrenewable nuclear	MJ	4.09	3.49	3.49	3.81	3.49	3.82	3.49	3.82
Renewable (biomass)	MJ	0.36	0.30	0.30	0.33	0.30	0.33	0.30	0.33
Renewable (solar, wind, hydroelectric, and geothermal)	MJ	4.20	3.51	3.51	3.90	3.51	3.91	3.51	3.91
Nonrenewable material resources	kg	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
Renewable material resources	kg	2.1E-02	1.8E-02	1.8E-02	2.0E-02	1.8E-02	2.0E-02	1.8E-02	2.0E-02
Net fresh water	L	0.20	0.09	0.09	0.11	0.09	0.11	0.09	0.11
Non-hazardous waste generated	kg	0.11	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Hazardous waste generated	kg	1.2E-04	1.0E-04	1.0E-04	1.1E-04	1.0E-04	1.1E-04	1.0E-04	1.1E-04

Drennan Yard sells aggregates produced at Parkdale. Parkdale aggregates are shipped by rail to Drennan Yard.

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Additional Environmental Information

Sustainability

Martin Marietta supplies the resources necessary for building the solid foundations on which our communities thrive. As a steward of the Earth's resources, our company incorporates sustainability as a core value within its business agenda. We always look at the big picture when it comes to environmental stewardship. For example, we take the smallest details into account such as changing out fluorescent light bulbs with less energy intensive LED lights.

Additional information on our environmental stewardship can be found in the annual sustainability report at:

<https://www.martinmarietta.com/Sustainability/>

Air Permitting

All Martin Marietta sites are dedicated to maintaining full compliance with air permit requirements. All of the Colorado sites maintain construction air permits under the Colorado Department of Public Health and Environment.

Additional information on air permit requirements can be found at:

<https://www.colorado.gov/pacific/cdphe/air-permits>

<http://deq.wyoming.gov/aqd/>

<http://ndep.nv.gov/bapc/permitting/permitting.html>

Used Oil and Battery Recycling

All of the used oil at our locations are picked up on site by approved oil recycling vendors. The used oil is then recycled appropriately once it has left the site.

All used batteries at our locations are stored in a secure and monitored area. The used batteries are then sent to approved battery recycling vendors.

Dust Suppression and Water Management

Martin Marietta highly values water as a precious commodity. Our sites work diligently to ensure that necessary dust suppression is applied in the most efficient means possible. Our non-hazardous dust suppression application allows us to water less; therefore, using as little water as possible.

Our sites also adhere to and maintain general storm water permits to ensure proper mitigation of the elements. We do our best to recycle as much of the water on site as possible to reduce our water usage footprint.

Mining and Reclamation

Our sites are performance bonded through the necessary agencies to ensure reclamation is completed. Reclamation is taken seriously to ensure our sites will be useful land areas post mining practices. Our sites have adequate reclamation plans to support biodiversity among plant species, while also taking into account the preexisting landscape to ensure proper revegetation techniques are utilized. For example, Specifications Aggregates actively reclaims and revegetates as the pit sequence continues. This puts reclamation efforts at the forefront, ensuring that the final surface contour is completed properly and ahead of schedule.

Environmental Product Declaration

Appendix A

Specification Aggregate Images

Image 1



Image 2



Image 3



Image 4



Image 5



Image 6



Environmental Product Declaration

Appendix A

Image 7



Image 8



Image 9



Image 10



Image 11



Image 12



Environmental Product Declaration

Appendix B

Riverbend Images

Image 1



Image 2



Image 3



Image 4



Image 5



Image 6



Environmental Product Declaration

Appendix B

Image 7



Image 8



Image 9



Image 10



Image 11



Image 12



Environmental Product Declaration

Appendix C

Granite Canyon Images

Image 1



Image 2



Image 3



Image 4



Image 5



Image 6



Environmental Product Declaration

Appendix C

Image 7



Image 8



Image 9



Image 10



Image 11



Image 12



Environmental Product Declaration

Appendix D

Spanish Springs Images

Image 1



Image 2



Image 3



Image 4



Image 5



Image 6



Environmental Product Declaration

Appendix D

Image 7



Image 8



Image 9



Image 10



Image 11



Image 12



Environmental Product Declaration

Appendix E

Parkdale Images

Image 1



Image 2



Image 3



Image 4



Image 5



Image 6



Environmental Product Declaration

Appendix E

Image 7	Image 8
	

Environmental Product Declaration

Appendix F

Drennan Yard Images

Image 1



Image 2



Image 3



Image 4



Image 5



Image 6



Environmental Product Declaration

Appendix F

Image 7



Image 8

