TECHNICAL SUPPORT DOCUMENT

TECHNICAL INFORMATION PRESENTED IN REVIEW OF AN
APPLICATION FOR A PART 70 OPERATING PERMIT

SUBMITTED BY

J.R. SIMPLOT COMPANY

For

J.R. SIMPLOT COMPANY

(SIMPLOT SILICA PRODUCTS)

Part 70 Operating Permit Number: 138
Minor Revision
Renewal Permit Issued: March 25, 2016
Renewal Permit Expiration: March 24, 2021

SIC Code 1446: Industrial Sand Mining

Clark County
Department of Air Quality
Permitting Section

July 31, 2016

TABLE OF CONTENTS

I. EXECUTIVE SUMMARY

Simplot Silica Products (Simplot) is an industrial sand mining operation. Simplot operates a silica pit and mill plant in Overton, Nevada. The operation produces a high (>98% SiO_2) silica sand for use in glass manufacturing. General activities include mining and conveying of the slurry at the pit, and processing, dewatering, drying and shipping of the silica product from the plant. Other activities include periodic blasting, stockpiling and management of waste piles, and annual dredging of settling ponds. The Part 70 source is located in Overton, Nevada, within the Moapa Valley air shed, hydrographic basin number 220. Hydrographic basin 220 is attainment for all regulated air pollutants.

Emission of regulated air pollutants at the source results from operations of the mining and milling equipment and processes, including a coal-fired sand dryer. The Overton plant has been designated as a Major Part 70 source because its emissions of regulated pollutants exceed the thresholds defined in the Clark County Air Quality Regulations Section 0. The pollutants for which Simplot is a major source are Nitrogen Oxide (NO_X) and synthetic minor for particulate matter equal to or less than 10 microns in aerodynamic diameter (PM_{10}). The source is a minor source for all other criteria pollutants. The primary source of NO_X is from the coal-fired sand dryer used to dry the mined sand. The primary source of PM_{10} is from the mining process prior to the slurry operations. The source is not a categorical source and for the purpose of PSD area applicability, the source is below the 250 tons per year thresholds for all pollutants.

PM_{10} emissions are created during the mining operations and handling of sand after the dryer. Pre-wetting the material or water sprays along the process line typically controls the PM_{10} emissions. Depending on the emission unit and minimum moisture content, a control factor may be applied to the fugitive emissions. The emissions are considered to be fugitive since they are not emitted through a vent or stack. The fugitive PM_{10} emissions are based on the amount of sand that is mined and processed. The production of sand and the dryer throughput are limited by the permit. The potential emissions for the source are shown in the table below:

Table I-1: Maximum Source PTE (tons per year)

PM_{10}	$PM_{2.5}$	NO_X	CO	SO_2	VOC	HAP	H_2S	Pb
90.24	**45.93**	**236.95**	**18.34**	**23.62**	**2.29**	**0.01**	**0**	**0**

Clark County Department of Air Quality (Air Quality) has been delegated to implement the requirement of the Part 70 operating permit program. Based on information submitted by the applicant and a technical review performed by Air Quality staff, Air Quality proposes the issuance of a Part 70 Operating Permit to Simplot Silica Products.

The coal-fired sand dryer is subject to the requirements of 40 CFR Part 60, Subpart UUU. The facility also has a gasoline dispensing operation to 40 CFR Part 63, Subpart CCCCCC and a 78 hp water pump subject to 40 CFR Part 60, Subpart IIII. By complying with, 40 CFR Part 60, Subpart IIII, this water pump meets the requirements of 40 CFR Part 63, Subpart ZZZZ.

II. SOURCE INFORMATION

A. General

Responsible Official:	Jared Jackson
Source Name:	J.R. Simplot Company
Source Address:	665 Simplot Road, Overton, Nevada 89040
Legal Description:	Moapa Valley (MV) Airshed
	Hydrographic Area 220
	T16S, R68E, Section 30
Address (Mailing/Billing):	P.O. Box 308, Overton, Nevada 89040
Telephone Number:	(702) 397-0021
FAX Number:	(702) 397-2798
Source SIC:	1446: Industrial Sand Mining
Source NAICS:	212322: Industrial Sand Mining

B. Description of Process

Simplot purchased the Overton Silica mining operation in 1955. The mine has been in operation since the early 1930s. The major activities at this source are the mining, screening, drying and loading of silica sand. The silica sand is mined from a pit, transported via a series of conveyer and mixed with water to form slurry. The sand slurry is pumped and passed through a floatation mill where size reduction and classification are carried out. The sized sand slurry is then pumped through a four mile pipeline to the main processing plant. The wet sand is then stacked in stockpiles for draining. The drained water is pumped to a tailing pond and reused after clarifying. The damp sand is then fed into a coal fired counter-current rotary dryer for drying. The moisture content of the sand is reduced to 0.25 percent by weight in the drying process. The dried sand is then screened, which results in the final product. The dried sand is then transferred to elevated storage bins prior to shipment. The high purity silica sand mined at the site is primarily used in the manufacture of glass.

Simplot's silica product process starts at the open pit mine where the active faces of the mine are constantly retreating. Silica sand is mined, and a hydro-sizing process is used to obtain the desired particle size. Periodically, blasting is used to start the mining process to break apart the sandstone formation. Simplot mines the sandstone with a dozer (front-end loader) and transports the mined material with haul trucks to a mine hopper/scalping screen. From the mine hopper/scalping screen the screened silica is transferred to series of conveyors, screens and eventually the slurry operations located at the end of the mining process in the mine area. A pipeline transfers the slurried sand to the mill site four miles northeast of the mine for refining and drying.

Once the 40% silica sand slurry is received at the mill plant, processing of slurry begins to produce the silica product. Upon arrival of the slurry to the mill, the sand is dewatered via screens/cyclones to approximately 20% moisture and stockpiled at moisture levels between 3 and 7%. The wet sand is transferred via a front-end loader into one of two wet sand hoppers and a conveyance system to feed the coal-fired dryer. The final product is loaded into trucks and railcars via another conveyance system.

Coal is received via a hopper, transport conveyor to a feed bin, and pulverized in an ABB Raymond mill. A 30 hp coal fan pneumatically transports the coal to the combustion chamber. The pulverized coal is fed to a COEN coal scroll, combined with combustion chamber air supplied by a 75 hp centrifuge fan, and subsequently combusted in the combustion chamber. The sulfur content in the coal burned cannot exceed 0.8% sulfur. Auxiliary propane fuel is used for coal-fired sand dryer start-up/heat up purposes and is used as a supplementary fuel to boost production rates.

The coal-fired sand dryer off-gases are collected in the dryer plenum, and entrained solids are removed in a refractory lined stainless steel cyclone. Both the ducting from the dryer plenum to the cyclone and the cyclone are refractory lined stainless steel due to the abrasive nature of the entrained silica sand. From the cyclone, the off-gases are cleaned in a Dustex baghouse. The baghouse fines/dust are transported via two small screw conveyors to a small slurry tank where the baghouse fines are slurried with process water. The slurry is pumped through a 4" PVC line to one of two settling ponds. The cleaned gases from the baghouse are ventilated using a 350 hp dryer exhaust fan. All ducting (cyclone to the baghouse to the fan and from the fan to the exhaust stack) are stainless steel. This ducting is currently insulated. The baghouse has a 2" layer of insulation for personnel protection and to prevent condensation of corrosive process condensate.

The hot sand from the coal-fired sand dryer runs through a grizzly screen in the dryer plenum and collects on a high temperature conveyor. The conveyor is rated at 400 ^{O}F. The sand temperature exit from the coal-fired sand dryer typically runs 250-300 ^{O}F. This sand mixes with the collected cyclone solids and then to a series of four Tyler screens. Fluidization air is supplied to the cooler by a multi-stage, 250 hp centrifuge compressor.

C. Current Permitting Action

This permitting action removes existing equipment and installs newer equipment located in the silica mine.

The application was submitted on April 13, 2016.

During this permitting action, the source presented more representative emission factors for the replacement of the existing equipment. Therefore, these new emission factors will be incorporated throughout the facility to provide the source new facility wide emissons for PM_{10} and $PM_{2.5}$.

III. EMISSIONS INFORMATION

A. Total Source Potential to Emit

The source potential to emit (PTE) for regulated air pollutants (Table III-A-1), as presented in the Part 70 Operating Permit issued on March 25, 2016.

Table III-A-1: Source PTE (tons per year)

PM_{10}	$PM_{2.5}$	NO_X	CO	SO_2	VOC	H_2S	Pb
97.82	47.72	236.95	18.34	23.62	2.29	0	0

The revised source potential to emit (PTE) for regulated air pollutants (Table III-A-2), as presented in this permitting action.

Table III-A-2: Source PTE (tons per year)

PM_{10}	$PM_{2.5}$	NO_X	CO	SO_2	VOC	H_2S	Pb
90.24	45.93	236.95	18.34	23.62	2.29	0	0

B. Control Technology

The new equipment will have a rated capacity of 500 ton per hour throughout this process, but the previous operating limit of 2,400,000 will remain in force. This change will also reflect consolidation of belt conveyors.

C. Emission Units, Emission Limitations, and PTE

The following table summarizes the allowable emission limits for the particulate matter sources:

Table III-C-1: Summary of PM_{10} Potential Emissions

EU	Description	SCC	Throughput (ton/hr)	Throughput (ton/yr)	PM2.5 EF1 (lb/ton	PM10 EF1 (lb/ton)	Control Method	PM2.5 (ton/hr)	PM10 (ton/yr)
A01a	Mining/Loading	30502513	500	2,400,000	0.000178	0.00117	1.5% Moisture	0.21	1.40
A02a	Raw Material Stockpile	30502507	1 acre					0.02	0.13
A03a	Loader to Grizzly Screen/Hopper	30502505	500	2,400,000	0.000013	0.000046		0.02	0.06
	Grizzly screen	30502511	500	2,400,000	0.00005	0.00074		0.06	0.89
	Grizzly Screen/Hopper toFeed Conveyor #1	30502505	500	2,400,000	0.000013	0.000046		0.02	0.06
	Grizzly Screen to Oversize Stockpile	30502513	20	180,000	0.000178	0.00117		0.02	0.11
A04a	Grizzly Scrren Oversize Stockpile	30502507	1 acre					0.02	0.13
A05a	Feed Conveyor #1 to Incline Conveyor #1	30502503	500	2,400,000	0.000013	0.000046		0.02	0.06
A06a	Incline Conveyor #1 to Scalping Screen	30502503	500	2,400,000	0.000013	0.000046		0.02	0.06
	Scalping Screen	30502511	500	2,400,000	0.00005	0.00074		0.06	0.89

	Scalping Screen to Feed Conveyor #2	30502503	500	2,400,000	0.000013	0.000046		0.02	0.06
	Scalping Screen to Oversize Stockpile	30502503	40	360,000	0.000178	0.00117		0.03	0.21
A07a	Scalping Screen Oversize Stockpile	30502507	I acre					0.02	0.13
A08a	Deed Conveyor #2 to Incline Conveyor #2	30502503	500	2,400,000	0.000013	0.000046		0.02	0.06
A09a	Incline Conveyor #2 to Wet Screen Turning Box	30502503	500	2,400,000	0.000013	0.000046		0.02	0.06
	Wet Screen Turning Box to Wet Screen	30502503	500	2,400,000	0.000013	0.000046		0.02	0.06
A09b	Wet Screen	30502511	500	2,400,000	0.00005	0.00074	15% Moisture	0.06	0.89
	Wet Screen to Oversize Conveyor	30502503	25	220,000	0.000013	0.000046		0.01	0.01
	Oversize Conveyor to Wet Screen Ox=versize Stockpile	30502503	25	220,000	0.000013	0.000046		0.01	0.01
A10a	Wet Screen Oversize Stockple	30502507	2 acres					0.04	0.26
A11a	Wet Screen to Slurry Hopper, Slurry Hopper to Product Slurry Line, and Tailing Line	30502503	500	2,400,000	0.000013	0.000046	25% Moisture	0.02	0.06
A22	Product Slurry Line to Dewatering Plant	30502503	200	1,200,000	0.000013	0.000046	1.5% Moisture	0.01	0.03
A24	Dewatering Screens	30502511	200	1,200,000	0.00005	0.00074	1.5% Moisture	0.03	0.44
	Dewatering Screens Discharge to Short Belt	30502503			0.000013	0.000046		0.01	0.03
A24-B	Short Belt to 70 Stacker, 1 Drop	30502503	200	1,200,000	0.000013	0.000046		0.01	0.03
	70 Stacker to 100 Sand Stockpile, 1 Drop	30502505	200	1,200,000	0.000178	0.00117		0.11	0.70
A28	Wet Stockpiles/6 acres	30502507	6 acres		See footnote 4		15% Moisture	0.01	0.04
A29	Wet Stockpiled Sand Loading to Sand Feed Hopper	30502503	200	1,200,000	0.000013	0.000046	1.5% Moisture	0.01	0.03

	Sand Feed Hopper to Sand Feed Belt	30502503			0.000013	0.000046		0.01	0.03
	Sand Feed Belt to Sand Feed Weigh Belt, 1 drop	30502503			0.000013	0.000046		0.01	0.03
	Coal-Fired Sand Dryer, 50 MMBtu/hour [2, 5]	30502508	50 MMBtu/hr	12,708 tons coal	See Table III-C-3		Sand Dryer Baghouse	37.67	37.67
	Sand Feed Weigh Belt to Dryer Sand Feed Chute, 1 drop	30502503			0.000013	0.000046	1.5% Moisture	0.01	0.03
A32	Dryer Discharge to Dryer Discharge Belt, Vented to Main Baghouse	30502503	200	1,200,000				0.07	0.07
	Cyclone Discharge to Cyclone Discharge Belt, Vented to Main Baghouse	30502503			0.00011	0.00011		0.07	0.07
A33-B	Cyclone Discharge Belt to Short Belt, Vented to Main Baghouse	30502503	4	24,000	0.00011	0.00011	Main Baghouse	0.01	0.01
A34	Dryer Discharge Belt to Screen Feed Belt, vented to Main Baghouse	30502503	200	1,200,000	0.00011	0.00011		0.07	0.07
A36	(4) Polishing Screens to Screen Return Belt, Screen Baghouse Control	30502503	192	1,152,000	0.00011	0.00011		0.06	0.06
	Screen Feed Belt to (4) Polishing Screens, Screen Baghouse Control	30502511	200	1,200,000	0.00087	0.00087	Screen Baghouse	0.52	0.52
A36-A	Screen Return Belt to Short Belt, Vented to Main Baghouse	30502503	192	1,152,000	0.00011	0.00011	Main Baghouse	0.06	0.06
	Short Belt to #1 Stacker, Vented to Main Baghouse	30502503			0.00011	0.00011	Main Baghouse	0.06	0.06
	#1 Stacker to 8 Storage Bins, 1 Drop, #1 Stacker Baghouse Control	30502505			0.00011	0.00011	Stacker Baghouse	0.06	0.06
A39	8 Storage Bins, Bin Baghouse Control	30502502	192	1,152,000		Emissions included in A36-A	Bin Baghouse	--	--

A40	Silo Drop to Conveyor and Load out Stacker/2 Drops with Choke Discharge and Load out Stacker Tail Pulley Baghouse Controls	30502503	192	1,152,000	0.00011	0.00011	Load out Stacker Tail Pulley Baghouse	0.06	0.06
A41	Load out Stacker Loading for Trucks or Railcars/Load out Stacker Head Pulley Baghouse Controls	30502505	192	1,152,000	0.00011	0.00011	Load out Stacker Head Pulley Baghouse	0.06	0.06
A42	Screen Oversize to East Reject Belt	30502503	8	62,400	0.000013	0.000046	Inherent Moisture	0.01	0.01
	Screen Oversize to West Reject Belt	30502503			0.000013	0.000046		0.01	0.01
	Transfer West to East Reject Conveyor to Sand Pile	30502505			0.000178	0.00117		0.01	0.01
A49	Stacker Drop to Stockpile	30502505	75	120,000	0.000178	0.00117	1.5% Moisture	0.01	0.07
A50	Oversize Stockpile, 2 Drops, 1 Acre	30502507	1.0 acre		See footnote 4			0.1	0.64
A112	Product Stockpile	30502507	1.0 acre		See footnote 4			0.1	0.64
A113	Oversize Stockpile	30502507	1.0 acre		See footnote 4			0.1	0.64
A123	Hopper Loading	30502513	10	100,000	0.000013	0.000046	Inherent Moisture	0.01	0.01
	Hopper	30502513			0.000013	0.000046		0.01	0.01
	Transfer Belt	30502503			0.000013	0.000046		0.01	0.01
	Transfer Belt	30502503			0.000013	0.000046	5.0% Moisture	0.01	0.01
B01	Coal Stockpile/0.8 acre	30502507	0.8 acre		See Footnote 4	--		0.02	0.12
C01	Operations Haul Roads	30502504	122,206 VMT/year		.071 lb/VMT	0.47 lb/VMT	--	5.63	41.89
	Pit Unpaved Haul Roads				1.49 lb/VMT	9.91 lb/VMT	90.0% Control		
C02	Blasting	30602009 30602010	1 blast/hr, 50 blasts/year			CE 82% lb/blast	--	0.05	0.3
D05	Deutz 78 hp	20300101	8,760 hours			--	--	0.17	0.17
							PM2.5/PM10 Subtotal	45.93	90.24

A01a through A11a are the process that were modified that changed equipment from 400 ton/hr to 500 tons/hr.

EU01 completes the source equipment list for a gasoline dispensing facility which is not identified in the above table.

1. Per AP-42 Section 11.19.1 (Sand and Gravel Processing), page 11.19.1-5, "in the absence of other data, the emission factors presented in [AP-42] Section 11.19.2 can be used to estimated emissions from corresponding sand and gravel processing sources."

2. Background Information for Revised AP-42 Section 11.19.2, Crushed Stone Processing and Pulverized Mineral Processing (May 12, 2003) recommends the use of controlled emission factors for raw materials containing a moisture content greater than or equal to 1.5%. Simplot is using the following emission factors from AP-42 Section 11.19.2, Table 11.19.2-2 for the referenced operations:

3. PM2.5/PM10 ratio assumed to be 0.15 for stockpile fugitive emissions per Table 1 of the Background Document for Revisions to Fine Fraction Ratios Used for AP-42 Fugitive Dust Emission Factors (November 1, 2006).

4. Per Equation 1 of AP-42 Section 13.2.4 (Aggregate Handling and Storage Piles), PM Emission Factor (lb/ton material transferred) = k * 0.0032 (U/5)^1.3 / (M/2)^1.4:

0.35	= k (Particle Size Multiplier for PM_{10})
1.5	= M (% moisture content for A01a, A03a, and A06a)
15	= M (% moisture content for 10a)

5. Per Section 2.3.1.3.3 of Fugitive Dust Background Document and Technical Information Document for Best *Available Control Measures* (EPA-450/3-88-008) for continuously active stockpiles, wind stockpile PM_{10} Emission Factor (lb/day/acre) = 1.7 * (s/1.5) * ((365-p)/235) * (f/15) * 0.5 (PM10/PM ratio) where:

2.6	= s (% silt content per AP-42 Table 13.2.4-1)
30	= p (number of days with > 0.01 inches of precipitation per year - from AP-42, Figure 13.2.2-1)
25	= f (% of time that wind speed exceeds 12 mph at mean pile height - based on Reid-Gardner, Moapa windrose)
80%	= CE, per AP-42 11.19.1 which states that the application of water can reduce emissions from 80-90 percent)

E = 0.7 lb PM_{10}/day/acre

6. Potential annual $PM_{2.5}$ emissions (tpy) = Annual Throughput (tons/yr) * Emission Factor (lb $PM_{2.5}$/ton) / 2000 (lb/ton)

7. Potential annual PM_{10} emissions (tpy) = Annual Throughput (tons/yr) * Emission Factor (lb PM_{10}/ton) / 2000 (lb/ton)

8. Potential annual stockpile $PM_{2.5}$ and PM_{10} fugitive emissions (tpy) = Area (acres) * Emission Factor (lb/day/acre) * 365 (days/yr) /2000 (lb/ton)

10. Data from Table III-C-1 of the March 2016 Technical Support Document for Source 138.

D. Emissions results from the project

	PM_{10}	**$PM_{2.5}$**
Existing	92.11	46.15
New	90.24	45.93
Difference	-1.87	-0.22

The emission impact of this project has no increase for this minor revision.

E. Performance Testing

No additional performance testing requirements were added to the permit during this permitting action.

F. Emissions Monitoring

The only moisture percent requirements that are being put in the permit apply to 1.5% and 5%. The moisture contents of 15% for EUs: 9b, 10a, and 28 and 25% for EU: 11a presume that the process is saturated with water and there are no emission from these processes.

G. Modeling

Simplot Silica Products is a major source in Hydrographic Area 220 (Lower Moapa Valley). Permitted emission units include one dryer, one generator and mineral processing. Since minor source baseline dates for PM_{10} (May 28, 1985) and SO_2 (May 28, 1985) have been triggered, a Prevention of Significant Deterioration (PSD) increment analysis is required.

Air Quality modeled the source using AERMOD to track the increment consumption. The facility was established in the 1930s. Baseline SO_2 emissions of 59.14 tons and PM_{10} emissions of 74.32 tons were included in the model. Stack data submitted by the applicant were supplemented with information available for similar emission units. Five years (1999 to 2003) of meteorological data from the McCarran Airport and Desert Rock Station were used in the model. United States Geological Survey (USGS) National Elevation Dataset (NED) terrain data was used to calculate elevations. Table 1 presents the results of the modeling.

Table 1: PSD Increment Consumption

Pollutant	Averaging Period	PSD Increment Consumption by the Source ($\mu g/m^3$)	Location of Maximum Impact	
			UTM X (m)	UTM Y (m)
SO_2	3-hour	11.52[1]	730475	4044404
SO_2	24-hour	2.51[1]	730500	4044400
SO_2	Annual	0.02	727548	4040177
PM_{10}	24-hour	23.13[1]	730475	4044404
PM_{10}	Annual	5.17	730420	4044472

[1] Second High Concentration

Table 1 shows the location of the maximum impact and the potential PSD increment consumed by the source at that location. The impacts are below the PSD increment limits.

IV. REGULATORY REVIEW

A. Local Regulatory Requirements

40 CFR 51, 52, 70 and 71.

Discussion: The PSD Class II increment consumption is not affected as a result of this modification.

B. Federally Applicable Regulations

None.

V. COMPLIANCE

There are no changes in compliance requirements from the previous Title V permit.

VI. EMISSION REDUCTION CREDITS (OFFSETS)

The source is not subject to offset requirements in this permitting action.

VII. ADMINISTRATIVE REQUIREMENTS

AQR Section 12.5.2.3 requires that Air Quality identify the original authority for each term or condition in the Part 70 OP. Such reference of origin or citation is denoted by [italic text in brackets] after each Part 70 Permit condition.

Air Quality proposes to issue the Part 70 Operating Permit Revision based on the regulatory analysis performed in this TSD.