northwest Clean Air agency
1600 South Second Street
Mount Vernon, WA 98273-5202
ph 360.428.1617
fax 360.428.1620
www.nwcleanair.org

Notice of Construction Worksheet (3/7/17)

NOC No. **1329**	Source: Sumas Concrete Products 3867 Kneuman Road Sumas, WA 98295 NOC Contact: Severin Samulski NWCAA No.:
Permit Engineer: **Christos Christoforou**	
NOC Received: **05/06/2019**	

A. Project Description

The proposed Sumas Concrete Products project consists of construction and operation of a new concrete precast production facility at 3867 Kneuman Road, Sumas, Washington. Lakeport Reach, LLC is the owner of Sumas Concrete Products. The proposed facility will be constructed on an 8.41-acre parcel located to the west of Sumas, Washington, as shown in Figures 1 and 2 below. The facility will produce a wide variety of concrete building products, including:

- Concrete masonry units (CMU), consisting of standard concrete building blocks, used for construction, bearing walls, partitions, and fire separation. Specialty CMUs will be manufactured in multiple sizes and finishes.
- Segmental retaining walls of various sizes and textures for soil retention and landscape purposes.
- Concrete bricks for wall cladding, and various colored paving stones for walkways, patios, and parking areas.

The proposed Sumas Concrete Products facility components are shown in Figure 3.

The concrete mixer proposed to be used at the facility is a Rapid Pan Mixer model R3000, with an input capacity of 4.5 m^3, an output capacity of 3 m^3, and capable of producing 90 m^3 of concrete per hour.

Note: this application was received on May 6, 2019, just prior to the revised version of Section 300 (NSR) of the NWCAA Regulation that became effective May 12, 2019. The application has been processing under pre-May 12, 2019 version of the rule.

Figure 1: Location of Proposed Sumas Concrete Products

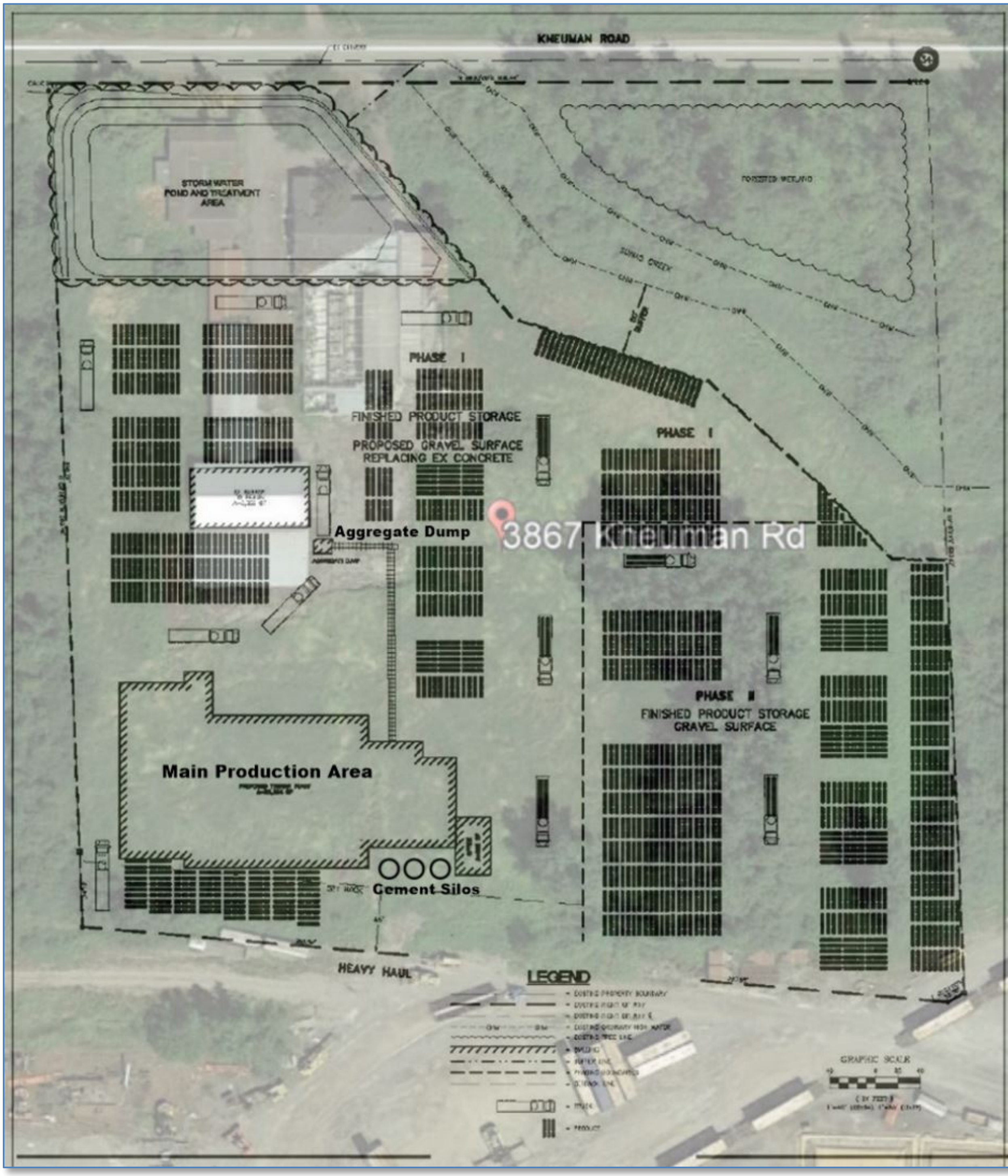

Figure 2: Schematic Diagram of the proposed facility

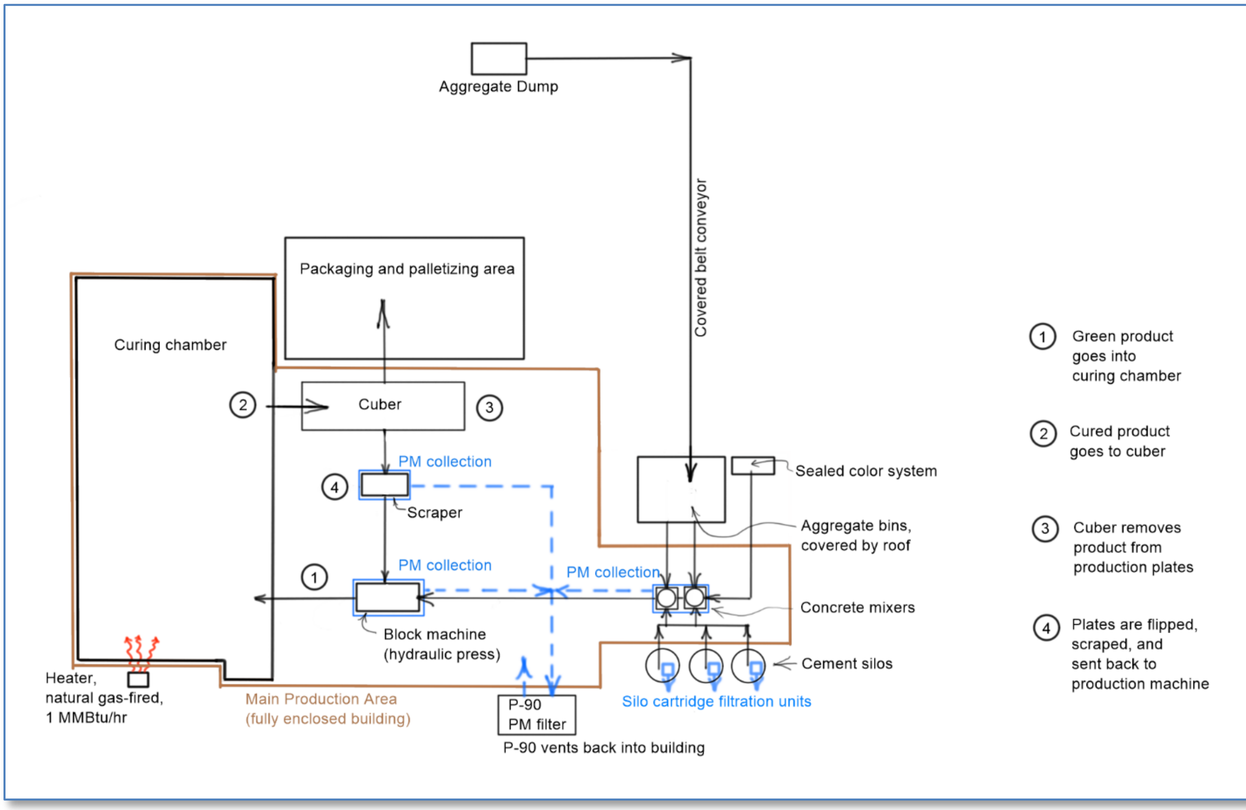

Figure 3: Process Flow Diagram

B. New Source Review (NSR) Fees

NWCAA NSR fees have been assessed in accordance with the fee schedule effective January 1, 2019. The NSR fees assessed and amount paid are listed in the NSR Fee Worksheet posted on the OAC Whiteboard for this project.

C. Public Notice

In accordance with NWCAA Section 305.1, an internet notice that the NWCAA received this NOC application and/or OAC revision request was posted on the NWCAA website for a minimum of 15 consecutive days ending on 5/21/2019. No requests for public comment were received.

Formal public involvement and notification (i.e., comment period and/or hearing) is not required for this project because the project review does not meet any of the criteria set forth in NWCAA 305.2. Criteria requiring public notice includes, but is not limited to, a project that exceeds a PSD threshold (e.g. 40 tpy NOx, 100 typ CO, 15 tpy PM_{10}), includes an -091 synthetic minor limit, has a TAP that exceeds the ASIL, has significant public interest[1], or a project that a public comment period has been requested by an individual during the period that the NOC was posted on the NWCAA website.

[1] NWCAA received the MDNS issued by the City of Sumas on September 9, 2019. Subsequently, NWCAA was informed via email on 10/22/2019 by Alan Butler, the Parametrix consultant working for the facility, that there will be a public hearing held by the City of Sumas on 11/12/2019 because of public interest in the project. Because of that, NWCAA decided to hold a 30 day comment period for the permit.

D. SEPA Review

State Environmental Policy Act (SEPA) review under NWCAA Section 155 is addressed as follows.

The City of Sumas is the SEPA lead agency for this project and issued the associated DNS/MDNS on September 4, 2019. A copy of this DNS/MDNS is included in the OAC file. This OAC is being issued after the date that the DNS/MDNS became final.

GHG Disclosure and Mitigation

There are no significant GHG emissions as a result of this project. The facility will use a small natural gas burner (1 MMBtu/hr) to provide heat for the curing of the concrete blocks. This boiler is below NWCAA's permit threshold.

E. Permit History

This is the first permit for the facility.

F. Basis for New Source Review Applicability

Emissions from the facility are from the following points:

1. Cement Handling and Storage

Cement will be delivered to the facility by truck. Cement will be conveyed pneumatically from the trucks to the three 53-foot-tall storage silos. Each silo will be equipped with a WAM Silotop polyester fiber cartridge filtration unit (264 square feet in area, rated to 942 cubic feet per minute) to control cement dust during filling. Silos will be equipped with level indicators and an anti-overfill system. Screw conveyors will move the cement to the mixing and batching system. Cement will be conveyed pneumatically to the concrete mixers inside the main production area.

2. Sand and Aggregate Bins

Aggregate and sand will be delivered to the facility by truck and will be dumped into an outside pit. Aggregate and sand will be transported by an inclined belt to one of eight sand and aggregate bins to be located on a covered, elevated platform next to the main production plant. The elevated platform will be equipped with a skip hoist to feed sand and aggregate to the concrete block production equipment, to be located inside the main production area.

3. Main Production Area

The main production area will be housed in a pre-engineered steel building with insulated wall panels and insulated roof. The building will be 30 feet high and 15,000 ft^2 in area and will contain the following concrete block production equipment:

- A concrete mixer[2] will blend the measured concrete, aggregate, and water to produce the appropriate concrete mix. The mixer will be hooded and vented to a Dustmac P-90 fabric filtration system.
- Mixed concrete will be charged into the block machine, where the various building blocks will be formed under high pressure onto production plates. The main

[2] The application mentions two mixers, but subsequent email conversations with Severin Samulski on 10/14/2019 and 10/15/2019 revealed that initially only one mixer will be installed. Severing said that they plan in the future to install additional mixer(s); I informed him that he would need a permit revision if new mixers are added.

production block machine will be housed in an isolated chamber used to reduce sound and vibration from the equipment, and will also be vented to the Dustmac P-90.

- The cast and compressed blocks will be conveyed on production plates into the curing chamber for curing. The curing chamber will be 4,000 ft^2 in area, with heat provided by a Johnson CurePak steam curing system, fired on natural gas, and rated at 1 million British thermal units per hour (MMBtu/hr) heat input. The CurePak steam curing system is exempt from new source review in accordance with Section 300.4(c)(5) of the NWCAA regulations.
- Cured concrete blocks will be conveyed to the cuber, where the blocks will be removed from the production plates.
- Cured concrete blocks will then be conveyed to the packaging and palletizing area, where they will be wrapped in plastic sheeting and placed onto pallets. Forklifts will transfer finished materials into the storage areas in the yard.
- The production plates will be conveyed to the scraper, where they will be recycled and conveyed to the block machine. The scraper will also be vented to the Dustmac P-90.

The Dustmac P-90 is manufactured by ESTA Apparatebau GmbH & Co. KG. It is designed for a maximum airflow of 4,700 cfm and has a capacity of 968.75 ft^2.

4. Product Storage, Loading Areas, and Internal Access Roads

General building block products will be stored in bins in the southeast corner of the property. Specialty block products will be stored in a covered laydown area, located north of the main production plant. The laydown areas will cleared, filled, and surfaced with a 1.5-inch layer of compacted rock. There will be a 50,000 ft^2 area for loading finished products onto delivery trucks, which will be paved with permeable pavers.

The project will have a paved road for trucks delivering raw aggregate and sand. Another paved internal road and turnaround will be used for loading trucks to ship the finished block products.

The applicant has requested an annual production rate of 100,000 tons of cement. According to information provided by the applicant (email by Sev Samulski on 10/15/2019), the maximum production rate at the facility is 618 tons of concrete per 8 hour shift. Calculations will be based on a potential production rate of 618*3*365=676,710 tons of concrete per year.

Table F-1 Potential Raw material inputs

Raw Material Inputs	Potential Facility Volume (ton/year)
Aggregate	11,945.82
Sand	575,628.86
Cement	105,093.40
Cement supplement	1,703.68
Dry materials subtotal	694,372

The applicant has presented emissions calculations that are based on methodology and emission factors from AP-42. A spreadsheet is included in the electronic folder for the permit with all details. Concrete production emission factors were taken from Table 11.12-2 of AP-42.

Emissions from trucks and loaders moving on both paved and unpaved roads were based on estimates extrapolated from data from the sister facility at Abbotsford, and calculated using equations from AP-42, chapter 13.2.1.

Emissions from aggregate and sand storage also are calculated using equations from AP-42, chapter 13.2.4. Some of this activity will take place within the enclosed production building, which will significantly reduce wind speed, and therefore fugitive emissions from this activity. Conservatively, it was assumed that all such activity happens outdoors.

The results are summarized in the table below.

Table F-2 Potential Emissions

Potential Emissions (tons per year) Summary based on 676,710 tons of concrete per year, uncontrolled			
	$PM_{2.5}$	**PM_{10}**	**PM**
Concrete Production	35.091	35.091	73.634
Trucks, paved road use	0.950	3.872	19.360
Front loaders, unpaved road use[3]	18.053	180.526	702.565
Aggregate handling and storage piles (wind erosion)	0.904	5.968	12.618
Total, ton/yr	**54.998**	**225.457**	**808.176**

Based on this conservative analysis, the facility is subject to permitting for particulate matter according to the de minimis values in NWCAA 300.4(D)(1)-(3): 1.25 tpy, 0.75 tpy, and 0.5 tpy for total suspended particulates (PM), PM_{10} and $PM_{2.5}$, respectively.

G. Toxic Air Pollutant Emissions and Impacts

The allowable production rate for the facility will be back-calculated from allowable emissions of toxic air pollutants. Toxic air pollutants are present in cement. The emission factors, from AP-42, are presented below.

Table G-1 Emission factors for metals present in cement (AP-42 table 11.12-8)

Emission factors, lb/ton	As	Be	Cd	Total Cr	Pb	Mn	Ni	Total P	Se
Cement silo filling w/ fabric filter	4.24E-09	4.86E-10	6.175E-10	2.80E-08	1.09E-08	1.71E-07	4.18E-08	2.95E-08	ND
Cement supplement silo filling w/ fabric filter	1.00E-06	9.04E-08	1.98E-10	1.22E-06	5.20E-07	2.56E-07	2.38E-06	3.54E-06	7.24E-08
Flyash silo filling w/ fabric filter	1.00E-06	9.04E-08	1.98E-10	1.22E-06	5.20E-07	2.56E-07	2.38E-06	3.54E-06	7.24E-08
Central mix batching w/ fabric filter	2.96E-07	ND	7.10E-10	1.27E-07	3.66E-08	3.78E-06	2.48E-07	1.20E-06	ND

Using the emission factors above, together with the potential usage of cement (105,093 tons of cement per year, which is needed to make 676,710 tons of concrete per year), the table below is prepared.

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[3] On October 31, 2019 I called Sev Samulski and asked about the use of front loaders at the new facility. He told me that initially there is no need for a loader, because aggregate and sand will be transferred to the concrete mixer via a conveyor screw system. He also said that there may be a small loader on site, but not always, for general cleanup jobs. He also said that in the future they will be making some products that use colored aggregate, and for those jobs a loader would have to be used. He said that colored aggregate could account for up to 20% of their product.
It should be noted that the numbers shown on Table F-2 for front loaders moving on unpaved roads are exaggerated (because are based on concrete production of 676,710 tpy) and not likely to occur in practice (e.g., 3.2 million, one half mile long each, trips per year).

Table G-2 below is compiled with information from WAC 173-460-150. Emissions of nickel are not included in Table G-2 because nickel is not a toxic air pollutant according to WAC 173-460-150; only two compounds of nickel are mentioned in WAC 173-460-150: nickel refinery dust and nickel subsulfide, neither of which is expected to be present in concrete.

See below for comments about chromium.

Table G-2 Potential metal emissions from concrete production, based on potential concrete production of 676,710 tons per year

Metal	Averaging Period	SQER (lb/av. period)	De Minimis (lb/av. period)	Emissions lb/yr	Emissions, lb/avg period	BACT? (emissions > de minimis)	Model? (emissions > SQER)
Arsenic	year	5.81E-02	2.91E-03	3.38E-02	3.38E-02	Y	N
Beryllium	year	8.00E-02	4.00E-03	2.05E-04	2.05E-04	N	N
Cadmium	year	4.57E-02	2.28E-03	1.41E-04	1.41E-04	N	N
Chromium		0.00128	0.000064	1.86E-04	1.86E-04	Y	N
Lead	year	1.60E+01	1.00E+01	5.94E-03	5.94E-03	N	N
Manganese	24-hr	5.26E-03	2.63E-04	4.22E-01	1.76E-03	Y	N
Total Phosophorus	24-hr	2.63E+00	1.31E-01	1.37E-01	5.72E-04	N	N
Selenium	24-hr	2.63E+00	1.31E-01	1.23E-04	5.14E-07	N	N

Chromium 6 considerations:

- The emission factor in AP-42 for Chromium is for total chromium; no chromium 6 is given.
- The CARB published a study, a copy of which is in the electronic folder for the permit, in which it assumed chromium in concrete to be entirely chromium 3.
- OSHA published standard 1926.1126 about exposure to chromium 6 in construction, except for exposure to Portland cement.
- The Department of Ecology issued a General Order for concrete batch plants, used AP-42 emission factors for chromium, but stated that chromium is "not regulated" and made no further comment.
- A scientific article titled "Analysis of the chromium concentrations in cement materials" reports a chromium 6 content that is approximately 1% of total chromium. To be conservative, this value has been used in the calculations presented in Table G-2[4].

According to this analysis, all toxic air pollutants from concrete production are below their respective small quantity emission rates present in WAC 173-460-150 provided that concrete production is below the potential 676,710 tons per year.

No further toxics analysis is carried out.

H. Criteria Air Pollutant Emissions and Impacts

The control factors used in calculations are presented in Table H-1 below.

[4] The value used here is more conservative than the ratio of 0.0071 to reflect Cr VI-to-Total Cr ratio described in Table 6, Hexavalent Chromium in Cement Manufacturing: Literature Review, Portland Cement Association, 2007

Table H-1 Control factors for concrete production

	$PM_{2.5}$, lb/ton	PM_{10}, lb/ton	PM, lb/ton
Aggregate transfer[5]	50%	50%	50%
Sand transfer[2]	50%	50%	50%
Cement unloading to silo[6]	95%	95%	95%
Cement supplement to silo[5]	95%	95%	95%
Sand and aggregate bin loading	0%	0%	0%
Mixer loading (central mix)	96.5%	96.5%	96.8%
Traveling on roads that have been water-sprayed	80%	80%	80%

Using the control emission factors in concrete production, the concrete production was calculated that would result to an emission of 5 tons/year of $PM_{2.5}$ or 7.5 tons of PM_{10}, which are the minor NSR modeling thresholds for those pollutants, and less than 25 tpy of PM (above which public comment is needed).

An annual limit of concrete production of 220,000 tons would result in actual emissions of 1.7 tpy of $PM_{2.5}$, 6.9 tpy of PM_{10} and 24.7 tpy of PM. It should be noted that the majority of emissions of both PM_{10} and PM result from movement of front loaders, which is an overestimation (see footnote 2). The PTE is less than the agency's thresholds for air dispersion modeling (5 tpy for $PM_{2.5}$ and 7.5 for PM_{10}) and emissions are assumed to not cause or contribute to any exceedance of an ambient air quality standard.

Table H-2 PTE as permitted with an annual production limit of 220,000 tons of concrete

	PM2.5	PM10	PM
Concrete Production	0.8	0.8	1.5
Trucks, paved road use	0.3	1.3	6.3
Front loaders, unpaved road use	0.4	3.8	14.9
Aggregate handling and storage piles (wind erosion)	0.1	1.0	2.1
Total, ton/yr	**1.7**	**6.9**	**24.7**

I. Prevention of Significant Deterioration (PSD) Program

Emission increases associated with this project were reviewed for Prevention of Significant Deterioration (PSD) Program applicability.

The facility is not an existing PSD major source.

This project is not over the PSD significance thresholds (including 75,000 tpy CO_2e).

J. Air Operating Permit (AOP) Program

After consideration of emission increases associated with this project, the Title V Air Operating Permit (AOP) program applicability for the entire source has been reviewed.

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[5] AP-42 does not provide emission factors for controlled aggregate and sand transfer. Control efficiency of 50% was proposed by the appliant because aggregate and sand will be dumped into an underground hopper and will be conveyed by a partially enclosed belt to an enclosed storage area within the main production building.

[6] SILOTOP dust collector literature states 95% control efficiency for cement dust > 1 µm diameter.

The Title V AOP thresholds are based on any of the following:

- Criteria air pollutants: PTE 100 tpy of any one pollutant.
- Hazardous air pollutants: PTE 10 tpy for any single HAP, or 25 ton/year of any combination of HAPs.
- Applicability of any federal NSPS or NESHAP regulation unless it is specifically exempt.

The facility is not a Title V air operating permit source because post project PTE remains below Title V applicability thresholds and criteria. The source is considered a "**natural minor**".

K. NWCAA Compliance Database (Stratus)

The NWCAA Stratus database has been updated to include the emission unit(s) approved by this OAC.

L. Confidential Business Information (CBI)

The NOC application does not contain any information deemed by the applicant to be CBI.

M. Applicable / Inapplicable Regulations

Relevant sections of NWCAA, state and federal regulations as they relate to the approved emission units listed in the OAC.

1. Northwest Clean Air Agency

- Section 342 contains operation and maintenance plan requirements.
- Section 451 contains generally applicable requirements for opacity.
- Section 455 contains generally applicable requirements for emissions of particulate matter.
- Section 550 contains requirements that sources employ RACT to prevent the release of fugitive particulate matter to ambient air.

2. State

WAC 173-400 contains requirements similar to those listed above. WAC 173-460 contains requirements for new sources of Toxic Air Pollutants.

- WAC 173-400-040 contains general emissions standards related to opacity, fallout, odor, and fugitive emissions.

3. Federal

None

N. Best Available Control Technology (BACT) Technology Review

1. This Project is Similar other NWCAA approved projects

- Cowden Readymix, OAC 1049, issued February 9, 2010. The concrete silo is equipped with a baghouse that is limited to emissions of 0.010 gr/dscf, and opacity of 5% (Ecology method 9A).

- Granite Pre-casting and Concrete, OAC 1162, issued July 24, 2013. The concrete silo is equipped with a baghouse that is limited to emissions of 0.005 gr/dscf, and opacity of 5% (Ecology method 9A).

- Greenbank, OAC 1331, issued August 14, 2019. The silos are equipped with baghouses that are able to provide 99.6% control of PM for particles larger than 1 micrometer in diameter. Opacity of 0% (Ecology method 9A).

2. Case-By-Case BACT

The applicant submitted a BACT analysis by reviewing similar permits issued in California, and the General Order issued by the WA State Department of Ecology, and submitted the following conditions to be incorporated in the permit as BACT:

- Cement transfers from trucks to the silos will be via pneumatic conveyance.
- Each silo will be equipped with a level indicator alarm to prevent overfilling.
- PM emissions from the silos during filling will be controlled by cartridge-type filtration devices. Each filtration device will be equipped with a gauge that measures pressure differential across the filtration media.
- The weigh hopper, concrete mixer, hydraulic block press, and plate scraper will be enclosed and vented to an adequate and appropriately sized polyester fiber filtration control device.
- Visible emissions from any exhaust vent shall not exceed 5 percent opacity.
- There must be no visible emissions crossing the property line.
- The permittee must develop and comply with a fugitive dust control plan (FDCP), which shall be incorporated into the operations and maintenance (O&M) plan required under Section 342 of the NWCAA regulations. The FDCP will cover internal haul roads and unpaved materials handing areas, including control of vehicular track-out from the facility.

NWCAA accepts the BACT analysis submitted by the applicant, except the opacity condition limit, which will be set at zero percent.

O. Basis for OAC conditions

(1) Production limit and recordkeeping.
(2) BACT for controlling emissions from cement/cement supplement silos.
(3) BACT for controlling emissions from weigh hopper and other processes in plant.
(4) Installation of differential pressure monitors to ensure proper operation of filtration systems.
(5) Recordkeeping for Condition 3
(6) Opacity from filtration system stacks (BACT)
(7) O&M for filtration systems
(8) Work Practice standards
(9) Work Practice standards
(10)Dust control plan
(11)O&M plan
(12)Recordkeeping
(13)Startup notification

P. Timeline and Review

Timeline		**Date**
NOC Received		05/06/2019
NOC Incompleteness Determined (due 30 days from receipt)		05/31/2019
NOC Completeness Determined		12/06/2019
Final Decision Due (due 60 days from complete)		
Final OAC issued		
Review		**Date**
NWCAA Engineering	Dan Mahar	11/7/2019
NWCAA Compliance	Matt Holmquist	11/12/2019
Source	Sev Samulski	12/06/2019

Q. Correspondence

10/15/2019 telephone conversation with Sev Samulski
I am trying to establish the PTE of the plant. I have asked Sev to tell me the most he can produce in a full operating day.

Wed 10/9/2019 4:19 PM
Alan Butler <ABulter@parametrix.com>
Fw: Question about Sumas Concrete MDNS
To Christos Christoforou

Bing Maps

External Message

Christos: That MDNS issued by the City of Sumas is indeed a final MDNS. Also, Sev Samulski says he is perfectly fine with a 100,000 ton per year production cap. I told him he would very likely be required to keep records showing that production had not exceeded 100,000 tpy over any consecutive 12-month period. He was fine with that.

Thank you
ATB

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Alan T. Butler, P.E.

Senior Engineer
206.930.1074 | mobile

From: Rollin Harper <rollinh@sehome.com>
Sent: Wednesday, October 9, 2019 2:45 PM