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December 13, 2022

Our Reference
Project No. 60663147

Eshetu Beshada
Senior Environmental Engineer
Manitoba Environment, Climate and Parks
Environmental Approvals Branch
1007 Century Street
Winnipeg MB R3H 0W4

RE: Selkirk Solar Glass Manufacturing Facility Project (File # 6137.00)– Environment Act Proposal Technical Advisory Committee Review Responses

Dear Mr. Beshada,

On behalf of Canadian Premium Sand Inc. (CPS), enclosed are responses to the Technical Advisory Committee (TAC) questions and comments received from you on December 2, 2022, regarding the Environment Act Proposal (EAP) application for the Selkirk Solar Glass Manufacturing Project (the 'Project').

If you have any questions regarding the proposed Project, please contact me at your earliest convenience.

Yours sincerely,

[redacted]

Marlene Gifford
Biologist, Environmental Assessor
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cc: Alasdair Knox (CPS)
Glenn Leroux (CPS)
Siobhan Burland Ross (MB Environmental Approvals Branch)

Attachment: Responses to TAC questions re: the EAP

AECOM

December 13, 1022

SELKIRK GLASS MANUFACTURING FACILITY ENVIRONMENT ACT PROPOSAL (EAP): File # 6137.00
RESPONSES TO TECHNICAL ADVISORY COMMITTEE (TAC) QUESTIONS RECEIVED FROM THE MANITOBA ENVIRONMENTAL APPROVALS BRANCH (EAB) ON DECEMBER 2, 2022

1. **City of Selkirk Wastewater Treatment Plant effluent is proposed to be used as process water for the proposed facility. Discuss any potential impacts to staff and operations should effluent quality parameters exceed the Industrial Service Agreement and/or the requirements of Environment Licence 3273 issued to the City of Selkirk. The City of Selkirk is required to submit a notice of alteration to their licence for consideration and approval**

   Since becoming fully operational, the City of Selkirk Wastewater Treatment Plant has not exceeded its effluent output quality parameters.

   It is anticipated that there will be no impact to staff and little to no impact on operations should effluent quality parameters exceed the Industrial Service Agreement and/or the requirements of Environment Act Licence 3273 (EAL 3273) issued to the City of Selkirk. Please refer to the answers to Question 2 below for mitigation and contingency measures.

   CPS has been working closely with the City of Selkirk regarding the use of the wastewater stream and the City of Selkirk is aware that a Notice of Alteration (NOA) to their EAL 3273 will be required.

2. **Discuss mitigation or contingency measures in the event the exceedances discussed above occur.**

   The following mitigation or contingency measures will be put in place for effluent quality parameters that exceed the Industrial Service Agreement and/or the requirements of EAL 3273 issued to the City of Selkirk:

   a. Monitoring – CPS will receive effluent quality data from the City of Selkirk and monitor the quality of the water received as an early warning of a potential exceedance
   b. Treatment – CPS will treat the water received from the City of Selkirk prior to utilising it within the glass manufacturing process. The capacity of this treatment facility will enable CPS to treat effluent with quality parameters that exceed those stipulated in Environment Licence 3273
   c. Blending – If it is anticipated that the effluent quality parameters will exceed the capabilities of the CPS treatment system, CPS will add potable water to produce a blend that meets CPS requirements
   d. Alternate Supply:
      i. CPS will have the ability to shut off the water supply from the City of Selkirk if the water quality exceeds the capabilities of the CPS treatment and blending
      ii. The CPS facility will be able to continue operating in the short-term utilising water from on-site storage
      iii. In the longer term, CPS will reduce production in order to reduce water requirements and utilise potable water

3. **Table 18 of the report identifies the 1-hour and 24-hour maximum acceptable level concentrations exceedance of the MAAQC for the NO2-TCM. Provide a discussion why the exceedance is expected and how you propose to mitigate it.**

   Table 18 of the report includes two calculational forms of NO_2 – Total Conversion Method (TCM) and Ozone Limited Method (OLM). The TCM form, in which all emissions are converted to NO_2 instantly, is presented for completeness only. It is theoretical and overly conservative and is not typically compared to regulatory standards.

   The OLM recognizes that chemistry in the air is limited by the ozone concentration which varies by location and season and by atmospheric mixing. OLM NO_2 is the more accurate value compared to regulatory standards. In Table 18, OLM NO_2 at all averaging periods is much less than MAAQC standards. As such, CPS is not planning further NOx mitigation.

4. **The GHG emissions are estimated to be about 399,000 tonnes/ year. This would make CPS the second largest GHG emitter in Manitoba. Describe any plans to reduce the GHG emissions from the facility.**

   CPS notes the 399,000 t/year of emissions is an outdated value. The most recent estimate was presented in a filing dated November 7, 2022 which provides a total emission of 228,280 TCO2e/yr (please refer to Table 133 in Section A6.7 of the Air Quality Assessment Report issued on November 7, 2022).

   The reduction follows a detailed review of technology and engineering of the furnaces as well as the decision to utilise electric powered tempering ovens rather than gas fired ovens that were originally considered.

   To provide further context, the bulk of the GHG is emitted from burning natural gas for the glass melting process. CPS has instructed the furnace supplier to allow for the possible future provision of electric heating nodes in the furnace. These nodes may be used in the future to reduce the amount of gas consumption, however, it may not be possible to obtain the amount of power required from Manitoba Hydro.

   CPS will continue to look for innovative ways to reduce GHG. For example:
   - electric powered forklifts will be utilised on site
   - CPS is interested in the advances in electric powered trucks and locomotives
   - CPS will explore carbon capture technologies which may become available in the future
   - CPS will continue to review other forms of combustion material for our furnace, for example hydrogen has recently been introduced as an alternative to natural gas in Europe

5. **Describe any potential wildlife accidents and any mitigation measure during night-time operation of the trucks transporting sands.**

   Sand delivery drivers contracted by CPS will be mandated to adhere to the posted speed limits and required to review wildlife collision avoidance and defensive driving measures such as those described by the Traffic Injury Research Foundation (TIRF) and the Wildlife Collision Prevention Program in British Columbia. In addition, CPS will continue to look for ways to enhance the safety of drivers such as in-vehicle wildlife detection systems that detect heat generated by animals to warn drivers of their presence.

   Please note the following websites:
   Traffic Injury Research Foundation (TIRFP):
   https://wildliferoadsharing.tirf.ca/about/about-us/#
   Wildlife Collision Prevention Program:
   https://www.wildlifecollisions.ca/prevention/safety-tips.htm

6. **Indicate the source or suppliers of the raw materials other than the sand.**

   CPS will source raw materials from private suppliers based on multiple parameters including quality, cost and location. These suppliers may change over time. At this time, it is anticipated that:

   - Soda ash will be sourced from the US
   - Aragonite (Limestone substitute) will be sourced from the US
   - Feldspar will be sourced from Europe
   - Dolomite will be sourced from Europe
   - Saltcake will be sourced from Canada
   - Sodium antimonate will be sourced from Canada

7. Provide the laboratory result that indicated the sand mined from Wanipigow sand mine meets the quality criteria to manufacture the solar panel glass.

The sand mined from the Wanipigow sand mine meets the quality criteria to manufacture glass for solar panels. In particular, the sand must have a very high silica content and a very low iron content.

In October 2021, CPS commissioned a 3rd party (Apex Geoscience Ltd) to prepare a "National Instrument 43-101 Technical Report". This 170 page report is a public document which provides details on the testing carried out to provide an 'inferred resource' estimate on CPS' Wanipigow silica sand glass mine.

Section 13 (pages 96-117) of the report provide details of the laboratory testing and results which indicate that the sand mined from the Wanipigow sand mine meets the quality criteria to manufacture the solar panel glass.

The full NI 43-101 document can be found by following the link below:
https://www.sedar.com/search/search_form_pc_en.htm

Then inserting the following information:

Company Name:	Canadian Premium Sand
Document Type:	Technical Report NI 43-101
Date of Filing:	2021

8. Provide detailed information on the specialized chemical conversion and filter system used for air emission treatment. Provide specification and emission control efficiency.

The chemical conversion system to be used on the glass manufacturing facility will be a state-of-the-art Catalytic Filter system (likely supplied by Tri-Mer). This system is designed specifically for removing particulate (PM), SO2, HCl, mercury and heavy metals. Simultaneously, the ceramic catalyst filters destroy NOx, cement organic HAPs, and dioxins.

Please refer to the attached literature for the emission control efficiencies.
Please also find attached a schematic drawing of the intended process flow for the CPS Selkirk Solar Glass Manufacturing Facility.

UltraCat

Catalytic Filter Systems

Particulate • NOx • SOx • HCl • VOC • O-HAP • Hg • D/F • CO

Tri-Mer® CORPORATION

Tri-Mer has installed more Catalytic Ceramic Filter Systems than all other suppliers combined, ***worldwide.***

Tri-Mer Corporation is the World's Largest Supplier of Ceramic Catalyst Filter Systems

All-in-One Solution

Tri-Mer UltraCat Catalytic Filter Systems are state-of-the art for removing particulate (PM), SO_2, HCl, mercury and heavy metals. Simultaneously, the ceramic catalyst filters destroy NOx, cement organic HAPs, and dioxins. Systems can be configured for any combination of the pollutants.

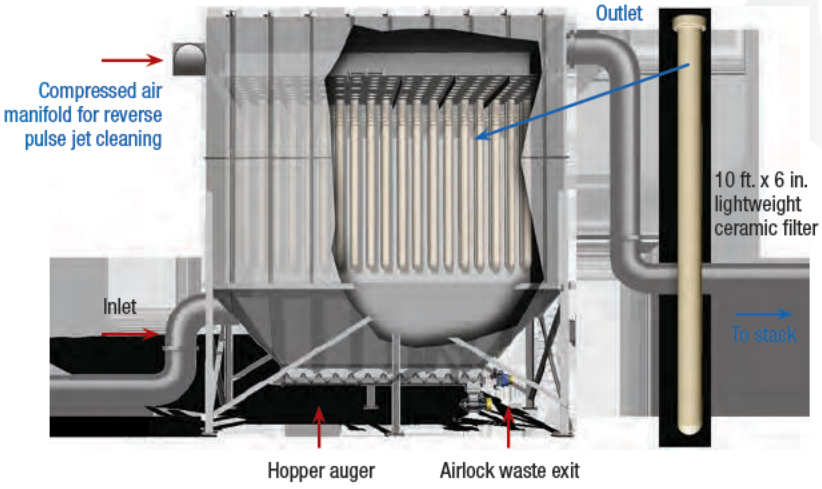
The system is completely dry, with no water consumption. Disposal of the dry collected waste is straightforward. Large gas flow volumes can be accommodated.

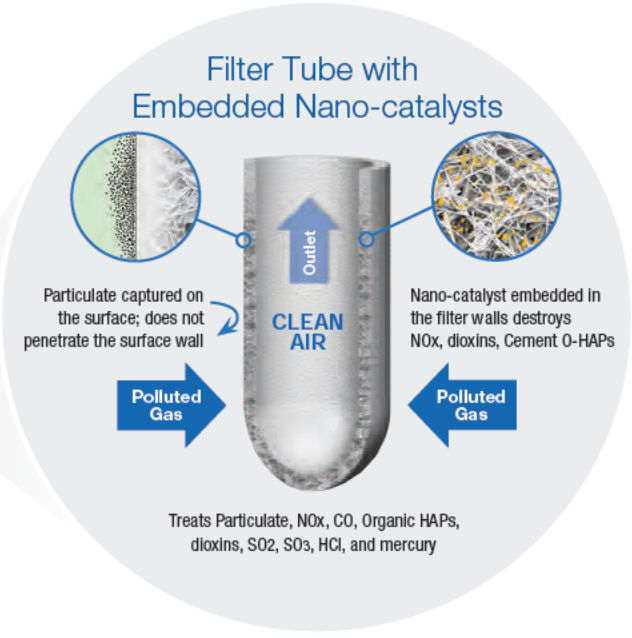
PM • SOx • NOx • VOC • Dioxins • HCL • Hg • CO

Boiler MACT • CISWI MACT • Lime MACT 2
HWC MACT • Cement NESHAP • Title V Compliance
CARB Diesel Regs • EPA Glass Regs • EPA Ceramics Regs

System Architecture

Ceramic filter tube wall is 3/4" thick with catalyst embedded throughout the wall. Filters are self-supporting without filter cages, and have a service life of 5 to 10 years.





Catalyst is inside the filter walls, protected from PM blinding and poisoning.

Particulate Control

Tri-Mer's UltraCat Filter System removes particulate from gas sources above 300°F, including PM10, PM2.5, and submicron. Typical outlet levels are less than 0.001 grains / dscf (2.0 mg/Nm3) regardless of inlet loading. Heavier loadings require more frequent pulse-jet cleaning of the filters but outlet levels remain the same.

NOx Control

UltraCat Catalytic filter tubes have nanobits of SCR catalyst embedded in the filter walls. Operating range is 350°F to 950°F. The large reactive surface area of the micronized catalyst produces high NOx removal at temperatures lower than standard SCR. Good results start at 350°F and improve to 95% removal at 450°F and above.

The unique structure of the filters captures process particulate on its outer surface, keeping it away from the nano-catalyst inside the filter walls. This prevents PM blinding and poisoning of the catalyst, and greatly extends the catalyst life compared to standard SCR.

Cement O-HAPs, Dioxin, VOCs

The VOCs designated as organic HAPs in cement regulations are destroyed by the embedded catalyst. Good removal on the primary Cement O-HAPs occurs at temperatures over 400°F, with excellent results on all Cement O-HAPs approaching 500°F. Other VOCs are also selectively destroyed. Dioxins are eliminated by the filters, typically with 95% efficiency or higher.

SO_2, SO_3, HCl, HF Removal Using Dry Sorbent Injection

Systems have an option for dry sorbent injection of calcium or sodium-based sorbents (hydrated lime, sodium bicarbonate and trona) to remove SO_2, SO_3, HCl and HF.

Powdered sorbents are injected upstream of the filters and the reaction by-products captured as particulate at the filters. The SO_2 removal reaction occurs within the duct leading to the filters and at the sorbent cake that accumulates on the surface of the filters. The chemical reaction of the sorbent with the acid gas creates a solid particle that is captured on the filters, along with the unreacted sorbent and the process particulate.

With dry sorbent injection, SO_2 removal is typically 90-95%, with removal efficiencies as high as 97%. HCl removal is typically 95%, and often as high as 99%. The temperature range for effective removal is 300°F to 1600°F.

Mercury Control

The system removes mercury using injection of dry sorbents. Powder activated carbon and other sorbents, some pre-blended with the acid gas sorbents, are selected on a case-by-case basis. Mercury control is a key feature.

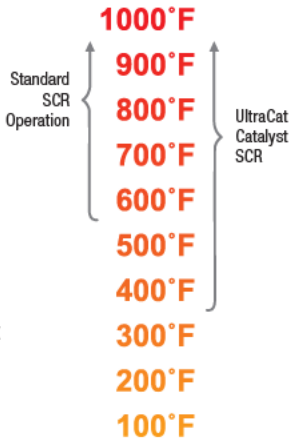
CO Removal

Tri-Mer systems can be configured to remove Carbon Monoxide, simultanously with other pollutants, at temperatures of 450°F and above.

A Revolution in NOx Control

- Very high removal efficiency, greater than 90%
- Greater than 90% removal at 400°F.
- Extended catalyst life because the micronized catalyst is embedded within the body of the filter and protected from blinding and poisoning.

The combination of these factors has revolutionized NOx removal, especially for applications that have temperature limitations and/or require the simultaneous removal of other pollutants.



At even lower temperatures, 350°F, the UCF system will remove NOx at approximately 70% efficiency. In addition to NOx, catalytic filters will remove PM, Cement O-HAPs and dioxins, and can be configured to remove CO, SO_2, HCl, and HF. Regulatory authorities have recognized the Tri-Mer UCF system to be a major advance in NOx and multi-pollutant control technology.

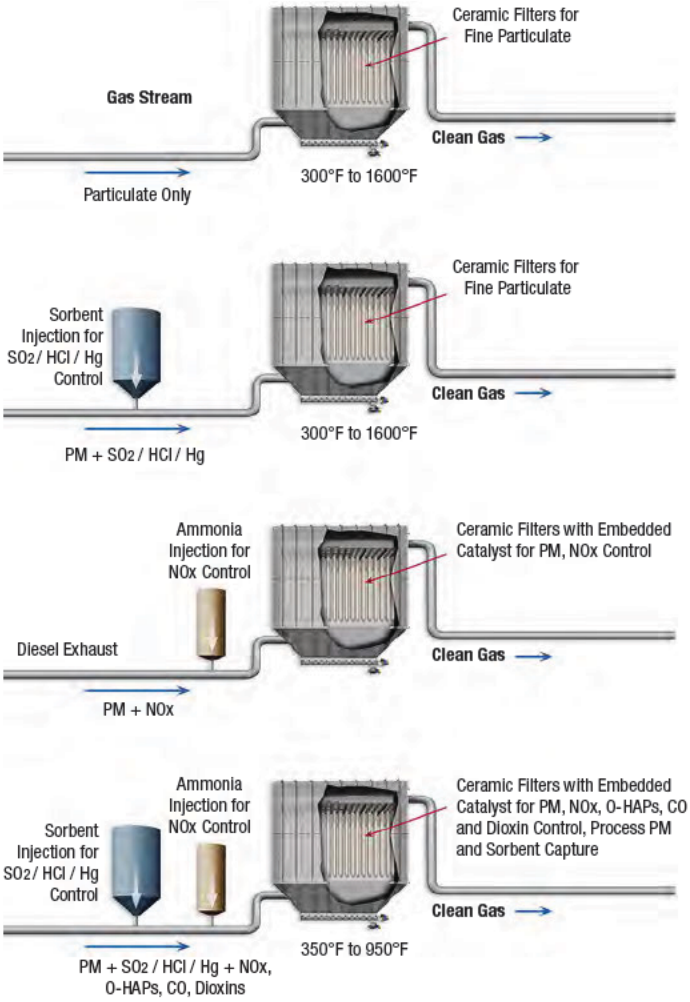
UltraCat Catalytic Filter and Power Generation Systems

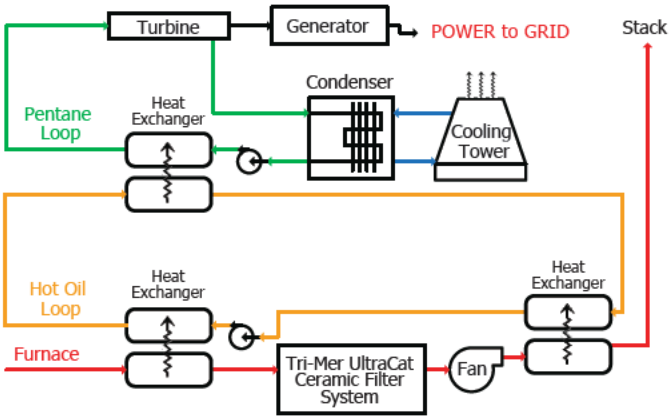
Tri-Mer UltraCat filter systems are ideal for maximizing the energy that can be extracted from furnace exhaust for use in an Organic Rankine Cycle (ORC) power generation loop. The heat is transferred to a hot oil intermediate loop, and then to an ORC loop (see figure below right).

Conventional technologies such as ESP and SCR have narrow hot operating ranges, and sizable heat loss across their combination. In contrast, the UCF is equally effective for pollutant removal over a very wide temperature range, including cooler temperatures (see NOx figure above), with a very low heat loss. The high tie-in temperature at the upstream heat exchanger, combined with a much lower exit temperature to the UCF system creates a greater ΔT. This increases thermodynamic efficiency. After the UCF cleans the gas, a second downstream stage of heat removal is incorporated.

The UCF flexibility allows continued control of emissions in the event the power generation loop goes offline for maintenance, making the UCF system the ideal pollution control technology to pair with heat recovery.

Several Versions of One Highly Effective System





The Tri-Mer System presents the optimal combination for pollution control performance and electrical power generation.

Tri-Mer® CORPORATION

air pollution control

Process Flow Diagram

Henry F. Teichmann, Inc.

Selkirk Manitoba, CA

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Air Flow, induced draft

Air Flow, forced draft

Liquid Flow, pumped

Solid Flow, pneumatic

Solid Flow, mechanical

Solid Flow, dense phase pneumatic

Compressed Air

Automated Louver
Closed

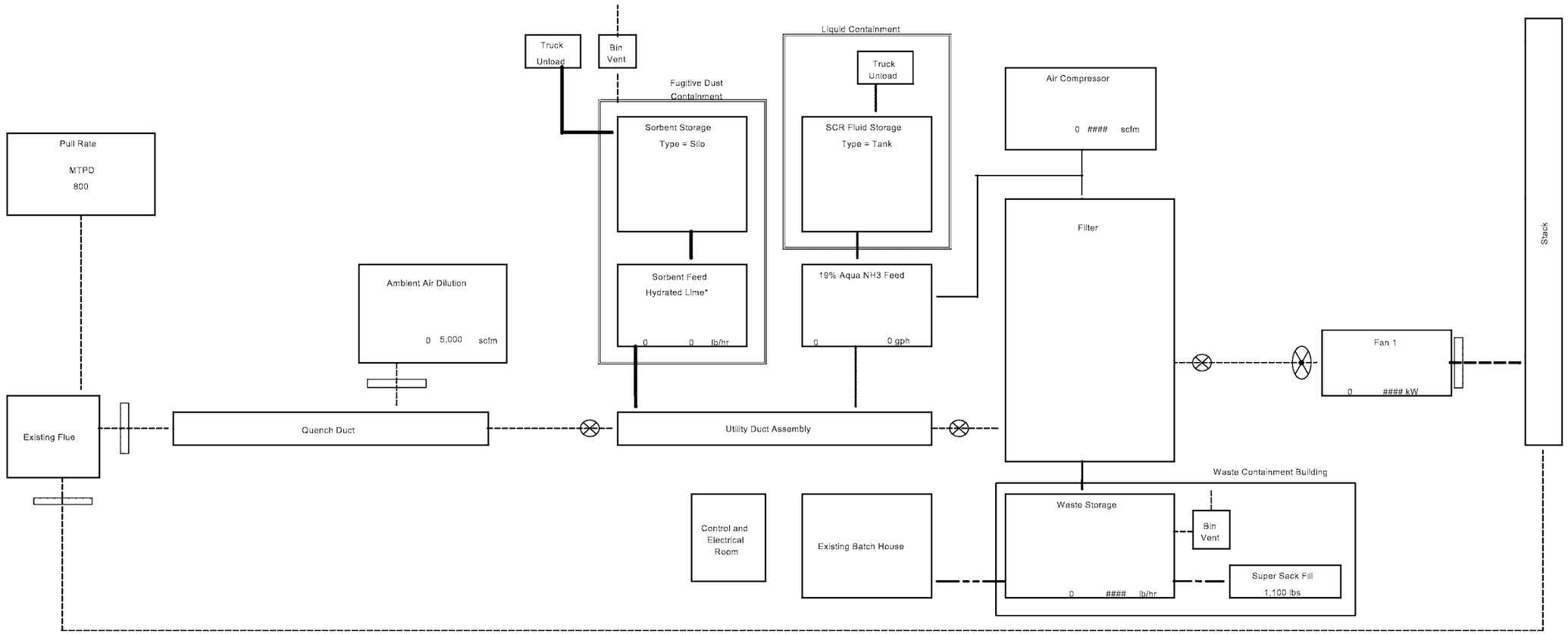
Multi-Blade Damper
Closed

Blank with Slide

Automated Louver
Open

Multi-Blade Damper
Open

Butter Fly Damper
Open



P18.500 Rev. D Ver.3

June 2, 2022