OPERATION & MAINTENANCE PLAN

FOR

GRAYMONT WESTERN US INC.
TACOMA LIME PLANT

1220 Alexander Avenue
Tacoma, Washington 98421

NPDES PERMIT NO. WA0001007

June 30, 2017

Reviewed: May 22nd 2023

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TREATMENT SYSTEM OPERATING PLAN CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Keith Wiggs
Name

Signature

Terminal Supervisor
Title

5/22/2023
Date

1.0 INTRODUCTION

The purpose of this plan is to document the operation and maintenance of the effluent treatment system at the Graymont Western US Inc. Tacoma Lime Plant, which has the capability to produce quicklime (CaO), hydrated lime ($Ca(OH)_2$), and precipitated calcium carbonate (PCC). Currently (June, 2017), the plant process quicklime and produces hydrated lime; the PCC facility has been mothballed, but could be operated again in the future. An upgrade of the effluent treatment system was completed in May of 2017. The upgrade included the installation of a new effluent pump station, a larger treatment system and a new outfall pipe and diffuser. The maximum treatment capacity increased from 450 gallons per minute (gpm) to 1,000 gpm. The flow meter was also upgraded in 2018 with the smart calibration feature.

This plan contains a description of the treatment system, the equipment involved in the system, and the maintenance that is routinely performed on this system. Other topics addressed include sampling and maintenance procedures.

The Tacoma Lime Plant discharges process wastewater and storm water to the Blair Waterway and is operating under National Pollutant Discharge Elimination System Waste Discharge Permit No. WA-000100-7 (NPDES Permit) issued on October 1, 2016. The Treatment System Operating Plan is required by special condition S4.A in the NPDES Permit.

1.1 SITE DESCRIPTION

The Tacoma Lime Plant is located on Lot 12, Block 9 of the Tacoma Tidelands in Tacoma, Washington. The site is nearly flat with a gentle slope to the southwest. The area near the site is predominately industrial and the nearest surface water is the Blair Waterway (Class B receiving water) located adjacent to the property. Appendix A contains a site map of the facility.

1.2 CONTACTS

The site owner, address and phone number are as follows:

Graymont Western US Inc.
585 West Southridge Way
Sandy, Utah 84070
(801) 716-2621

The Tacoma facility address and phone number are as follows:

Graymont Western US Inc.
Tacoma Lime Plant
1220 Alexander Avenue
Tacoma, Washington 98421
(253) 572-7600

The site contacts are listed as follows:

Table 1: Contact Information

Name	Title	Telephone Number (Primary)	Telephone Number (Secondary)
Keith Wiggs	Plant Supervisor	253-428-6544	253-381-7090

2.0 PROCESS DESCRIPTION (WASTEWATER TREATMENT)

Wastewater introduced to the treatment process consists mainly of storm water runoff, but also includes excess process water from the production of precipitated calcium carbonate (if in operation), limestone washing, truck rinse, dust control at times, the hydration scrubbers, and ground water from the pump wells of the seepage mitigation project (SSDR permit #SHR2011-40000174654). Since the PCC facility is currently not in operation, process wastewater discharge to the wastewater treatment system is negligible. A process flow diagram of the wastewater treatment system is shown in Appendix B.

The two parameters of concern in the treatment system are total suspended solids (TSS) and pH. The wastewater treatment system consists of three sections that were designed to control these two parameters: the primary settling pond, secondary settling pond, and the pH control system.

TSS is minimized in the wastewater by the primary and secondary settling ponds. Water that enters the settling pond system is retained until the majority of the TSS settles out. Most of the suspended solids in the water are composed of calcium carbonate ($CaCO_3$) clusters that settle to the bottom of the settling ponds. As water leaves the settling pond system, it is routed to a treatment system where acid is added to lower the pH to the permitted range of 6 to 9 before discharge.

Transfer of water from the various sumps throughout the plant to the ponds is controlled automatically by level switches (high/pump on and low/pump off). In addition, manual controls are utilized to transfer water to and from other sources within the system. Once water enters the ponds, depending on the available volume, it is transferred between the primary and secondary settling ponds automatically.

2.1 SETTLING POND SYSTEM

Five sources discharge water to the settling pond system. The following is a list of approximate discharges from the site that enter the settling pond system:

- PCC process: 40,000 gallons per day (gpd)
- Stone wash: 32,000 gpd
- Truck wash: 15,000 gpd
- Wheel wash: 30,000 gpd
- Storm water: 43,200 gpd

Water used in the hydration scrubbers for air pollution control is normally sent to a holding tank and then shipped off site. However, excess scrubber water may be discharged to the pond system.

Approximately 126,400 gpd of wastewater could be treated at the site in addition to storm water. The settling pond system is designed to hold the precipitation from a 25-year, 24-

hour storm in addition to the process wastewater. Discharges from the site are a combination of process and storm water.

2.1.1 Primary Settling Pond (South Pond)

The primary settling pond is 50 feet wide, 120 feet long, and ranges from 2 feet deep to 8 feet deep depending on how full it is with settled solids (approximate capacity is 90,000 to 350,000 gallons). This pond handles the majority of the incoming wastewater from the plant: all of the water from the PCC process, stone wash, dust control runoff, and most of the storm water runoff.[1] The main objective of the primary settling pond is to allow adequate time for the majority of suspended solids to settle out. The water from the primary settling pond is pumped to the secondary settling pond for additional settling prior to discharge.

2.1.2 Secondary Settling Pond (North Pond)

The secondary settling pond is 159 feet wide, 180 feet long, and ranges from 4 feet deep to 16 feet deep depending on how full it is with settled solids (approximate capacity is 680,000 to 2,725,000 gallons removing 20% for the flow control weir). The main objective of the secondary settling pond is storage of the wastewater and storm water from the primary settling pond for an additional period of time to allow further settling. During periods of excessive precipitation, extra pumps and hoses are used to move excess water to the secondary settling pond from the primary settling pond. Once the solids have settled, the water/storm water is pumped to the pH treatment system.

2.2 pH Control System

Treatment of the lime plant wastewater is necessary to comply with the Water Quality Standards for Surface Waters. Tacoma's NPDES Permit limits the pH of the discharged wastewater to a range of 6 to 9.

The pH treatment process is controlled by pH inputs to an automated control circuit. As the pH changes the controller adjusts the acid pump speed to compensate for the changes. The system consists of a wetwell and vertical turbine pumps located in the secondary settling pond, two reaction tanks in series (first tank is mixed and second tank is an attenuation tank), acid storage tank, acid delivery pumps, and associated automatic valves, instrumentation (pH and turbidity probes and flow meter), and controls.

If the effluent pH from the treatment system is either too low (near pH 6) or too high (near pH 9), automatic valves are used to recycle the effluent to the secondary settling pond. Once the pH is stable within the permitted range, the automatic valves revert to their normal positions and the discharge to Outfall 001 resumes. If the wastewater pumped from the pond has a high turbidity, automatic valves are used to recycle the wastewater to the secondary settling pond, thus preventing high-turbidity wastewater from entering the reaction tanks. Once the turbidity has decreased to an allowable level, the automatic valves revert to their normal positions and wastewater flow to reaction tanks resumes.

[1] PCC process and stone wash are currently not in operation.

If the pH or turbidity does not revert to normal conditions after an extended period of recycle, the pump system shuts down. The system alarms and will not operate or discharge water from Outfall 001 until the system is manually inspected and restarted.

3.0 OPERATIONAL OBJECTIVES

3.1 TOTAL SUSPENDED SOLIDS (TSS)

One goal of the settling pond/pH control system is to reduce the TSS in the wastewater to an average monthly value equal to or less than 25 milligrams per liter (mg/L) and a maximum daily value of equal to or less than 50 mg/L prior to discharge. An on-line turbidity measurement is used to continuously provide an estimate of the TSS concentration; the TSS concentration in mg/L is approximately equal to the turbidity measurement in NTUs.

3.2 pH

A second goal of the settling pond/pH control system is to lower the pH of the wastewater to within a range of 6 to 9 prior to discharge into the Blair Waterway in accordance with NPDES Permit No. WA-000100-7.

4.0 SAMPLING

Sampling is performed as required by the NPDES Permit. This section briefly describes the sampling schedule, sample locations, sampling analysis, and lab procedures that are required to properly monitor the treatment system.

4.1 EFFLUENT LIMITATIONS

Water discharged at the permitted location (Outfall #001) is currently subject to the effluent limitations shown in Table 2.

Table 2: Effluent Limitations

PARAMETER	AVERAGE MONTHLY	MAXIMUM DAILY	SAMPLE TYPE/ FREQUENCY
TSS (mg/L)	25	50	Grab/Quarterly
pH	6 to 9	6 to 9	Grab/Quarterly

Other parameters, such as acute toxicity, are monitored for a limited time as required by the NDPES Permit. No effluent limitations apply to these other parameters. Refer to the NPDES Permit for further information.

4.2 SAMPLING LOCATIONS AND INTERVAL

The Graymont employee takes TSS grab samples once per quarter from the permitted discharge outlet as required by the NPDES permit. The pH is measured and in the quarterly grab sample as required by the NPDES permit. Additional pH readings are recorded by the pH control system to ensure the pH remains within the permitted range. Mercury grab samples are taken once every quarter from the discharge outlet as required by the permit.

Table 3 below summarizes the routine effluent monitoring requirements. Table 4 summarizes the effluent toxicity testing requirements, which were completed in 2018.

Table 3: Effluent Monitoring Requirements

PARAMETER	SAMPLE FREQUENCY & TYPE	NOTES
Flow (gpd)	Continuous, Metered	Must measure/sample daily when continuous monitoring is not possible. Must be reported on DMRs.
Temperature (degree Celsius)	Quarterly, Measurement	Sampling must occur when effluent is at or near daily maximum temp, which is usually late afternoon. Must be reported on DMRs.
pH	Quarterly, Measurement	Must be reported on DMRs.
TSS (mg/L)	Quarterly, Grab	Must be reported on DMRs.
Mercury (ng/L)	Quarterly, Grab	Must be reported on DMRs.

Table 4: Effluent Toxicity Testing Requirements

PARAMETER	SAMPLE FREQUENCY & TYPE	STATUS
Acute WET Characterization	September 2018, grab samples of at least 5 concentrations of effluent, including 100% effluent and a control. EPA Method 821-R-02-012 for Fathead minnow 96-hr static-renewal test and Daphnid 48-hr static test.	Completed, and report submitted on 11/29/2018.
Acute WET Characterization	January 2019, grab samples of at least 5 concentrations of effluent, including 100% effluent and a control. EPA Method 821-R-02-012 for Fathead minnow 96-hr static-renewal test and Daphnid 48-hr static test.	Completed, and report submitted on 2/19/2019.

4.3 Sampling Analysis and Lab Procedures

The amount of TSS is determined by following the appropriate methods listed in *Standard Methods for the Examination of Water and Wastewater*. In addition, a cross-check of pH is made at the time of the TSS sample and is used to ensure that the pH meter is registering correctly. Mercury is analyzed using EPA method 1631E by an outside Ecology certified laboratory. The procedures for sampling and analysis of mercury are described in a workplan titled Graymont Tacoma Quarterly NPDES Permit Compliance Effluent Sampling and Analysis Plan (CH2M, June 2017).

5.0 RECORDKEEPING PROCEDURES

The discharge is electronically recorded by the upgraded discharge system. The flow rate and other required monitoring parameters are reviewed quarterly. The records from quarterly sampling are kept in the Main Office for three years.

5.1 SAMPLE FORMS

No specific forms are used for the sampling of TSS or pH. Chain-of-custody forms are included when samples are delivered for offsite analysis. A copy of the chain-of-custody form is kept with the sampling records. A Quarterly Discharge Monitoring Report (DMR) for TSS and pH is completed and submitted to the Washington State Department of Ecology (DOE) in accordance with the plant's NPDES permit. Discharge flow and temperature are also recorded in the DMR.

5.2 RECORDING RESULTS

For each measurement or sample taken, the following information must be recorded in accordance with the NPDES Permit:

1. Date, exact place, method, and time of sampling or measurement;
2. Person who performed the sampling or measurement;
3. Dates the analyses were performed;
4. Individual who performed the analyses;
5. Analytical techniques or methods used; and,
6. Results of all analyses.

6.0 SAFETY

Safety meetings are held routinely at the Tacoma Lime Plant. Process-specific safety procedures are covered, as well as general safety issues. The Mine Safety and Health Administration (MSHA) standards are followed. Spill prevention training briefings are conducted once every year during monthly plant safety meetings per 40 CFR Part 112.

7.0 MAINTENANCE PROCEDURES

This section documents the maintenance practices that are currently being used to operate the wastewater treatment system. In addition, this section identifies an approximate time frame, as well as person or persons responsible to perform the maintenance. Where possible, reference to manufacturer recommendations and to tools and equipment necessary for performing such maintenance is made.

Note that no additional substances are added to the wastewater system during maintenance. Therefore, maintenance/repair activities do not affect the volume or character of the wastewater discharged.

7.1 SETTLING PONDS

The primary and secondary settling ponds are visually checked by operations on a routine basis. An operator inspects the condition of the ponds and views the level of sedimentation to see if sediment removal is needed. Normally, an below-ground transfer pipe is used to move water between the ponds; this transfer pipe is typically cleaned out on an as-needed basis.

7.2 pH Control System

The discharge and pH control system is visually inspected on a routine basis. The person inspecting the system checks the pH value on the pH meter display, records the pH value, date, and time on the log sheet, and initials the entry on the log sheet. If a problem is observed, the maintenance department is notified immediately. Maintenance personnel are available on site during the day shift, Monday through Friday, and are on call at all other times. No special tools are needed to perform the day-to-day maintenance activities of the pH control system.

7.3 Pumps

Graymont employees periodically check the pumps for proper operation. Generally, the pumps operating the wastewater treatment system experience few problems.

7.4 Flow Monitoring Devices

Flow monitoring devices will be calibrated at a minimum frequency of at least one calibration per year.

8.0 SPARE PARTS INVENTORY

The current system has online spare pumping capacity, obviating the need for a spare parts inventory. Other parts are locally available (see Section 8.1).

8.1 Local Suppliers

System maintenance parts are available from several local suppliers; all are within approximately five miles of the plant. Phone numbers and addresses for these suppliers can be found in the suppliers' file folder or in the maintenance foreman's filing system. All other supplier information can also be found in the files mentioned above.

8.2 Equipment Warranties

All equipment warranties and catalogues are kept in the various files around the Tacoma Lime Plant. Warranties and catalogues can be found in the generic warranty file, the suppliers' file folder, or the maintenance foreman's filing system.

9.0 FLOW METER

A Rosemount 8700 series magnetic Flowmeter system, model 8705 flow tube and model 8732 transmitter is installed in the pump discharge line to the treatment system. During normal operation, because all the wastewater pumped to the treatment system flows to outfall 001, this flow meter records the outfall 001 discharge volume. When bypassing back to the secondary settling pond occurs, the control system will still record the flow rate, but will flag the recorded flow rate as recycle instead of discharge. Any flows occurring during recycle will not be added to the calculation done by the control system to determine daily discharge volumes.

10.0 COAL MANAGEMENT

Currently, coal is not stored at the plant. If stored, the coal storage area will be visually inspected periodically to ensure coal is properly contained. Coal management best practices include: 1) Maintaining the level of the coal pile base at or below the third level of the ecology block wall; 2) Repairing holes in the coal tent and maintaining the inner tent side guards; 3) Using the yard sweeper around the coal storage area as needed, 4) Inspecting the coal storage facility monthly during routine site environmental inspections, 5) Clean up all coal spills from loader and forklift hauling activities, and 6) Contain and clean up all coal spills from barge unloading operations.

11.0 TRUCK WHEEL WASH

The truck wheel washes located at the main truck scale and at the PLS plant will be maintained in good working order. They will be inspected periodically to verify proper operation.

12.0 TROUBLE SHOOTING

Troubleshooting is used to locate and identify solutions to problems. This section lists some potential problems and possible solutions to them.

12.1 TSS EXCURSION

Excess accumulation of settled solids in a settling pond can cause higher levels of TSS. During these circumstances, the discharge is discontinued, and the settled solids are removed. Once the pond has 'settled', the water in the pond is re-analyzed for TSS. When the TSS is below the NPDES Permit limits, the discharge of water from the ponds is resumed.

Higher levels of TSS can also occur if the water level around a sump pump in either pond is low and has a high slurry viscosity. If this occurs, the discharge is discontinued until the water level in the pond increases.

12.2 pH EXCURSION

If the pH goes out of the permitted range (6 to 9), the pond discharge is stopped until the problem is corrected. The pH meter is one potential source for low or high readings. Inspect the meter and probe for cleanliness and proper operation; clean if necessary. If the pH meter needs recalibration, trained plant personnel will clean and calibrate the unit. If it cannot be calibrated, all discharge is stopped until a new unit can be installed and normal operation is observed.

High pH can be caused by insufficient acid in the storage tank, an electrical short to the mixer, or a malfunctioning acid pump. If high pH is observed, the following steps will be taken. If the pH reaches the permit limits of 6 or 9, the discharge valve closes automatically and no water is discharged from Outfall 001 until the problem is corrected. Potential causes of high pH and actions to take are summarized below.

1. If high pH is observed, check the inventory in the acid storage tank. Order acid if the acid level in the tank is low.

2. If the acid level in the tank is sufficient, inspect the mixer for any electrical shorts. If a short is found, fix the problem and observe the system until the pH is within the permitted range.

3. If the cause of the pH problem is not identified in the first three steps, inspect the acid pump. Check that an airlock is not present in the pump. Next, dismantle the pump and inspect the 'O' ring, clear the valves, and clean the internal components. Reassemble the pump, restart the system, and observe until the pH is within the permitted range.

4. Once the pH is within the permitted range, start the discharge of water to the Blair Waterway.

Low pH has not been an issue at the plant.

13.0 Emergency Procedures

1. Emergency procedures for plant shutdown and cleanup in event of wastewater system upset or failure include the following: The secondary pond is operated at a level that is below the maximum level. This reserves some of the pond volume for storage in the event that the treatment system is in an upset condition (such as high turbidity or high pH) and in recycle mode or if the system has failed such as a localized power failure that affects the treatment system only).

2. The pump system from the secondary pond has two, 100-percent capacity pumps. If one pump fails, the other pump will automatically take over pumping.

3. If a power outage occurs, then storm water cannot be pumped to the secondary pond. In this event, storm water accumulates at low elevations, which are generally where storm water pumps are installed. Once power has been restored, the pumps will automatically start and will transfer the accumulated storm water to the secondary pond.

4. This situation generally does not result in the need for cleanup because the storm water naturally drains to the pump locations and doesn't accumulate in areas that cannot drain to the pump stations.

APPENDIX A

Site Map

APPENDIX B

Process Flow Diagram