

**Brunner Island, LLC
REGULATORY DELIVERABLE
SUBMITTAL COVER SHEET**

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NAME:		ORGANIZATION:	
Brunner Island, LLC Contact Name:			
Brunner Island, LLC Contact Phone:			
Mailing Address: Brunner Island, LLC P. O. Box 221 York Haven, PA 17370		Street Address: Brunner Island, LLC 1400 Wago Road Mt. Wolf, PA 17347	

OPERATION AND MAINTENANCE IMPROVEMENT PLAN

BRUNNER ISLAND, LLC
East Manchester Township
York County, Pennsylvania

RETTEW Project No. 075752003
MAY 2020



RETTEWSM

Prepared by
RETTEW Associates, Inc.
5031 Richard Lane, Suite 111
Mechanicsburg, PA 17055
800-738-8395
rettew.com

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Figure 1 - Attached

1.0 INTRODUCTION

Brunner Island, LLC (Brunner Island) owns and operates an electric generation facility located in East Manchester Township, York County, PA. Sanitary sewage generated within the facility is collected, conveyed and treated at an onsite sewage treatment plant (STP). Treated effluent is discharged to the Susquehanna River via Outfall 003 pursuant to the facility's National Pollutant Discharge Elimination System (NPDES) Permit No. PA0008281.

As required under Paragraph 38 of the Consent Decree signed July 31, 2019 and entered on November 8, 2019, Brunner Island has prepared this Operation and Maintenance Improvement Plan to identify steps to improve the STP's compliance with the effluent limitations in Brunner Island's NPDES Permit. Historical STP performance (November 2013 through March 2019) has resulted in the following type and frequency of exceedances: Total Suspended Solids (eight occurrences), Total Residual Chlorine (four occurrences), and Total Phosphorus (two occurrences). This plan was developed to mitigate the reoccurrence of these exceedances.

Upon approval from the Department, Brunner Island will implement this Plan in accordance with the schedule provided below.

2.0 STP OVERVIEW

All sanitary sewage is conveyed to the STP via #1 Lift Station. An influent Parshall flume (not currently in service) receives flow from #1 Lift Station. Raw sewage flows by gravity to the comminutor box where soda ash and alum are added for alkalinity supplementation and phosphorus removal. Flow continues to flow by gravity to the Equalization Tank. Sump pump(s) direct the flow from the EQ tank to the splitter box. Flow is split at the Flow Control Box. A portion of forward flow is directed into the Flow Equalization (EQ or Surge) tank and the remainder of the flow is conveyed by gravity to the aeration tanks and final clarifiers. Final clarifier effluent flows by gravity to the Chlorine Contact Tank for disinfection with sodium hypochlorite followed by tablet dechlorination. Treated effluent flows by gravity over a v-notch weir located in MH SS-4, metered and is ultimately discharged to the Susquehanna River via Outfall 003. An automatic effluent composite sampler is located adjacent to the chlorine contact tank and collects samples downstream of the tablet dechlorination system to document NPDES permit compliance. Waste Activated Sludge (WAS) or excess sludge generated as a result of the biological treatment process is transferred into a sludge holding tank located at the western end of the aeration tanks. Sludge is hauled away approximately once per month by a contract hauler and disposed of at a Local Publicly Owned Treatment Works (POTW). A schematic of the Brunner Island STP is shown in Figure 1.

3.0 PROPOSED UPGRADES

An initial site visit was conducted to evaluate current operations, meet with Brunner Island Staff and identify potential operational improvements. The proposed upgrades will support facility goals to improve overall effluent compliance and reliability during high flow events.

3.1 INSTRUMENTATION AND CONTROL IMPROVEMENTS

3.1.1 Additional Alarms

Install the following alarm conditions and transmit the conditions to the main Brunner Island distributed control system (DCS):

1. EQ Tank High Water Alarm
2. EQ Blower Failure
3. Process Blower Failure
4. Chlorine Analyzer Failure

3.1.2 Analog Transmission

Install radio transmission of analog signals from the STP to the Brunner Island Main Plant Control Room. The addition of the I/O radio signals will allow Brunner Island personnel, trend and set deviation alarms for the following STP analog values:

1. Effluent Flow
2. EQ Tank Level
3. Chlorine Residual

3.1.3 Influent Flow Meter

The influent flow meter will be installed to monitor high flow events and generate a High Flow Alarm condition. Monitoring of influent flow will provide staff additional time to react to high flow events as will be further discussed below.

3.2 OPTIMIZE EQ TANK

Install an automatic recycle valve to facilitate flow control through the STP. The current configuration requires manual operation of the recycle valve to control the flow.

3.3 AUTOMATED HIGH FLOW MANAGEMENT PROCESS

Install additional appurtenances and controls needed to bring Units A & B online automatically during a high flow event. Replace the existing manual valves on the pipes to Units A and B with automatically actuated valves. The automatic valves will open when needed to utilize Units A and B to provide surge tanks during high flow events. When flow returns to normal levels, the Unit A and B tanks can be pumped back to the EQ Tank or to Unit C.

Implementation of the automated high flow management equipment and controls will maximize the use of existing facilities to accommodate high flow conditions.

3.4 PROCESS CONTROL IMPROVEMENTS

To facilitate improvements described above, a programmable logic controller (PLC) with a human/machine interface (HMI) will be installed at the STP to receive the analog and digital inputs and to modulate and/or actuate the various valves in either of the above scenarios. The addition of the PLC allows more flexibility and control of the STP.

3.5 ULTRAVIOLET (UV) DISINFECTION

Install a UV disinfection system to eliminate the potential for total residual chlorine (TRC) excursions. Ultraviolet disinfection eliminates the need to chlorinate the wastewater as well as the need to dechlorinate the effluent to achieve permit compliance.

3.6 EFFLUENT FILTRATION

Install a disk filtration system on the effluent flow prior to discharge to insure compliance with the effluent total suspended solids (TSS) limit.

4.0 CONCLUSIONS AND RECOMMENDATIONS

Implementing the modifications described above, and summarized below, will improve the operational consistency at the Brunner Island Sewage Treatment Plant.

Item No.	Description
1	EQ Tank Optimization (EQ Tank)
2	Process Control Improvements (PCI)
3	Additional Analog Alarms/Alarm Transmission (Alarms)
4	UV Disinfection System (UV)
5	Effluent Filtration (Filter)
6	Automated High Flow Management (HF Mgmt.)
7	Influent Flow Meter (Flow Meter)

5.0 PROJECTED IMPLEMENTATION SCHEDULE

Brunner Island intends to proceed with Items 1-3 immediately upon approval of this Operation and Maintenance Improvement Plan by the PADEP. Additionally, Brunner Island understands that issuance of a Water Quality Management (WQM) - Part II construction permit from PADEP is required prior to commencement of construction of Items 4 and 5. Brunner Island intends to initiate engineering following approval by PA DEP of this plan and submit an administratively complete WQM Part II permit application by December 31, 2020. The projected schedule below includes time for design, permitting, procurement of equipment, installation and commissioning. Based on this schedule, Brunner Island anticipates that construction of the UV disinfection and Effluent Filtration improvements will be complete within 12 months of issuance of the WQM Part II permit. Items 6 & 7 will be completed following successful implementation of Items 1-3.

Months →	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
Item No.																											
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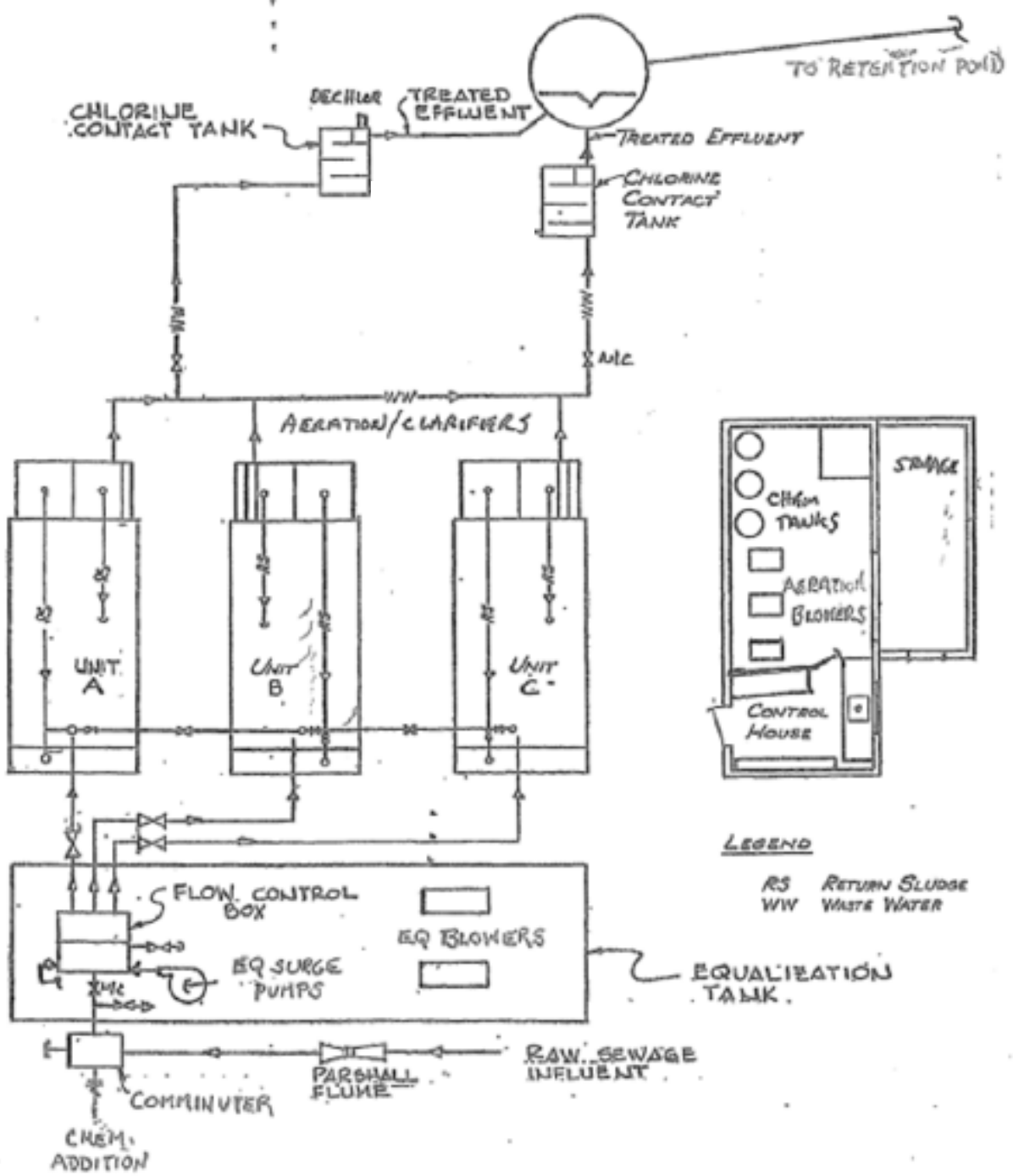


Figure 1