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JUN 20 2018
DEPARTMENT OF ECOLOGY

June 19, 2018

To: Jeanne Tran
Washington State Department of Ecology
3190 160th Ave SE
Bellevue, WA 98008

Re: Annual Treatment System Operation Plan (TSOP) Review Confirmation

Dear Ms. Tran:

This notice is being sent to you per Section S4.A.2 of Nucor Steel's NPDES Permit # WA-0031305.

During our annual review, Nucor Steel revised Table 6: Maintenance Schedule. Several references to document sections were numbered incorrectly as a result from the previous document revision in November of 2017. No other changes were needed.

Please call myself at 206-933-2290 or Patrick Jablonski at 206-933-2238 if you have any questions or comments.

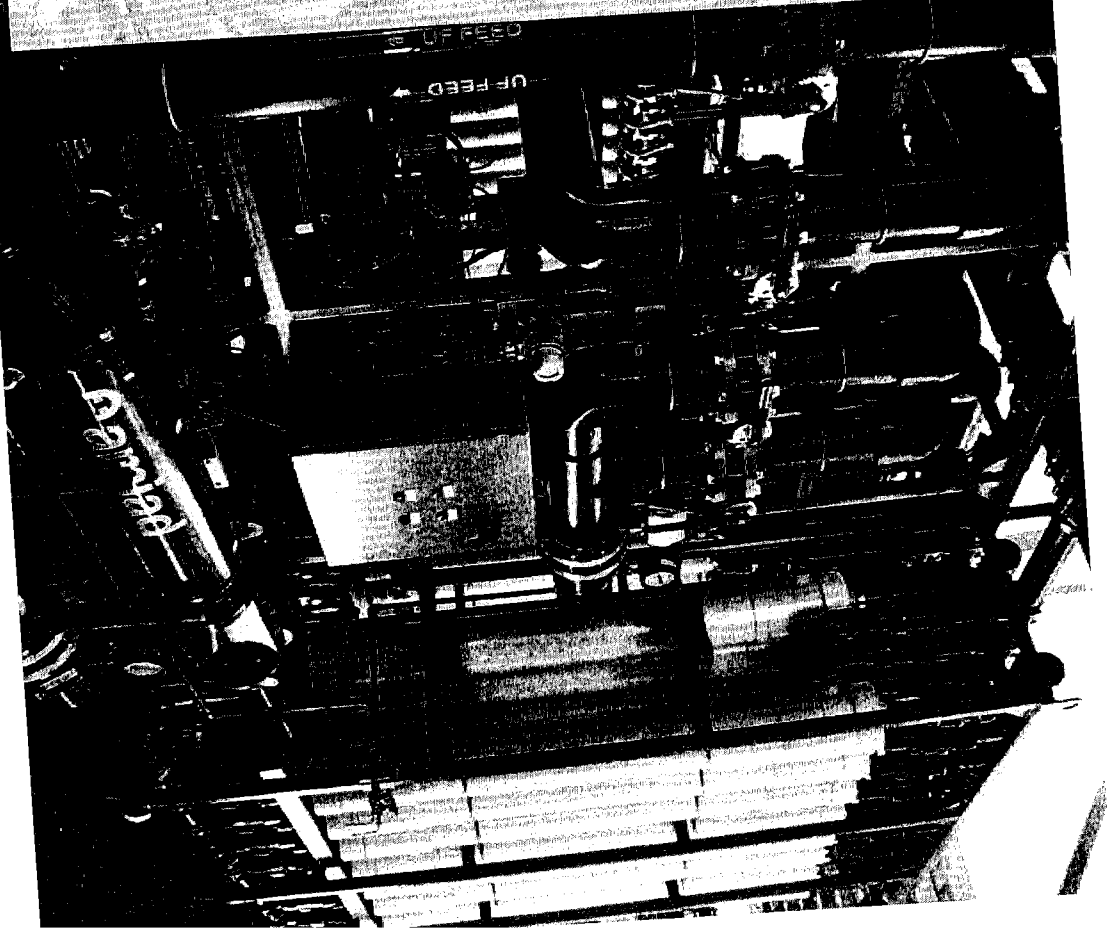
Respectfully,

Matthew J. Lyons
VP / General Manager
Nucor Steel Seattle, Inc.

Nucor Steel Seattle Inc., 2424 SW Andover Street, Seattle, Washington 98106-1100
Phone: (206) 933-2222 Fax: (206) 933-2207

Nucor Steel Seattle, Inc.

Treatment System Operation Plan



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Compliance Checklist

This Treatment System Operation Plan has prepared in accordance with NPDES Permit Number WA0031305, Section S4 and WAC 173-240-150. Table 1 below references the various regulatory requirements and the corresponding information in the plan.

Table 1: Compliance Checklist

Treatment System Operation Plan Requirement	Plan Reference
NPDES Permit Number WA0031305, Section S4, A: The TSOP must include: A baseline operating condition, which describes the operating parameters and procedures, used to meet the effluent limits of S1 at the production levels used in developing these limits.	Section 5
NPDES Permit Number WA0031305, Section S4, A: The TSOP must include: the operating procedures and conditions needed to maintain design	Section 5 Section 9

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treatment efficiency. The monitoring and reporting must be described in the plan.	
NPDES Permit Number WA0031305, Section S4, A: In the event of an upset, due to plant maintenance activities, severe stormwater events, startups or shut downs, or other causes, the plan must describe the operating procedures and conditions employed to mitigate the upset. The monitoring and reporting must be described in the plan.	Section 6 Section 9
NPDES Permit Number WA0031305, Section S4, A: A description of any regularly scheduled maintenance or repair activities at the facility which would affect the volume or character of the wastes discharged to the wastewater treatment system and a plan for monitoring and treating/controlling the discharge of maintenance-related materials (such as cleaners, degreasers, solvents, etc.).	Section 5
NPDES Permit Number WA0031305, Section S4, A: The TSOP must include: Emergency procedures for plant shutdown and cleanup in event of wastewater system upset or failure.	Section 12
NPDES Permit Number WA0031305, Section S4, A: The TSOP must include: Any directions to maintenance staff when cleaning, or maintaining other equipment or performing other tasks which are necessary to protect the operation of the wastewater system.	Section 5
NPDES Permit Number WA0031305, Section S4, A: The TSOP must include: Wastewater sampling protocols and procedures for compliance with the sampling and reporting requirements in the wastewater discharge permit.	Section 8
WAC 173-240-150 (2)(a): The TSOP must include: The names and phone numbers of the responsible individuals.	Section 2
WAC 173-240-150 (2)(b): The TSOP must include: A description of plant type, flow pattern, operation, and efficiency expected.	Section 4
WAC 173-240-150 (2)(c): The TSOP must include: The principal design criteria.	Section 3
WAC 173-240-150 (2)(d): The TSOP must include: A process description of each plant unit that includes function, relationship to other plant units, and schematic diagrams.	Section 4
WAC 173-240-150 (2)(e): The TSOP must include: An explanation of the operational objectives for the various wastewater parameters, such as sludge age, settleability, etc.	Section 5
WAC 173-240-150 (2)(f): The TSOP must include: A discussion of the detailed operation of each unit and a description of various controls, recommended settings, fail-safe features, etc.	Section 5
WAC 173-240-150 (2)(g): The TSOP must include: A discussion of how the facilities are to be operated during anticipated startups and shutdowns, maintenance procedures, and less than design loading conditions, so as to maintain efficient treatment.	Section 6
WAC 173-240-150 (2)(h): The TSOP must include: A section on laboratory procedures that includes sampling techniques, monitoring requirements, and sample analysis.	Section 8
WAC 173-240-150 (2)(i): The TSOP must include: Recordkeeping procedures and sample forms to be used.	Section 9
WAC 173-240-150 (2)(j): The TSOP must include: A maintenance schedule that incorporates manufacturer's recommendations, preventative maintenance and housekeeping schedules, and special tools and equipment usage.	Section 5

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WAC 173-240-150 (2)(k): The TSOP must include: A section on safety.	Section 11
WAC 173-240-150 (2)(l): The TSOP must include: A section that contains the spare parts inventory, address of local suppliers, equipment warranties, and appropriate equipment catalogues.	Section 10 Attachment 2
WAC 173-240-150 (2)(m): The TSOP must include: Emergency plans and procedures.	Section 12

2 SYSTEM OVERVIEW AND PURPOSE

This Treatment System Operating Plan (TSOP) has been prepared in accordance with NPDES Permit Number WA0031305, Section S4 and WAC 173-240-150 for the wastewater treatment system at the Nucor Steel Seattle facility at 2424 SW Andover Street Seattle, WA 98106. The purpose of the TSOP is to present technical guidance and regulatory requirements to the treatment system operators to enhance operation under both normal and emergency conditions.

The NPDES discharge from the facility consists of stormwater, ground water infiltrate, and occasional non-contact cooling water. This water is treated and discharged through Outfall 001 passing under Spokane Street and eventually entering into Elliott Bay. Figure 1 displays the facility site plan and Outfall 001. The treatment systems provide pH neutralization, sedimentation, chemical addition for filtration aid, and active carbon treatment. A description of each water source follows.

Stormwater

Stormwater is generated through incidental precipitation on the 52-acre site. Using the Western Washington Hydrology model, the volume of a 2-year, 1-hour peak storm event is 3,600 gallons per minute (gpm). Stormwater is conveyed to the treatment system by a series of catch basins, drains and stormwater conveyances. To the extent possible, water in the stormwater system is recycled into facility processes, however stormwater represents most of the water treated and discharged under Nucor's NPDES permit.

Groundwater Infiltrate

Ground water infiltrate is the result of the inflow of ground water to the underground stormwater collection and conveyance system at the facility. Groundwater infiltrates into this system and mixes with the stormwater.

Non-contact cooling water

Non-contact cooling water is generated from the electric arc furnace and reheat furnace cooling water systems. The furnace cooling system recirculates water through water jackets around the main furnaces. The water used for cooling at NUCOR comes from a combination of city water, ground water from a well on the NUCOR property, and the recycled water from the treatment system. The amount of well water used is limited by the water rights for the facility. While this waste stream is authorized for treatment and discharge under the permit, it rarely passes through the treatment system.

Cooling water blowdown discharges were covered under the previous NPDES Permit, but is now discharged to the sanitary sewer system under a separate discharge authorization permit with King County. Modifications were made to the influent collection system in late 2008 to prevent this waste stream from entering the stormwater treatment system.

3 CONTACTS

Table 1 below shows the contacts responsible for operation of the treatment system and compliance with the NPDES permit. In addition, emergency and 24 hour contacts are provided.

Table 2: Contacts

Name/Title	Phone	Email
Patrick Jablonski *Environmental Manager*	Work: (206) 933-2238 Mobile: (206) 713-0969	Patrick.jablonski@Nucor.com
Jeffrey Eis *Environmental Engineer*	Work: (206) 933-2205 Mobile: (206) 963-6045	Jeffrey.eis@Nucor.com
Environmental Engineer	Work: (206) 933-2223	
John Dedmon *Treatment System Operator*	Work: (206) 933-2285	John.dedmon@Nucor.com
Clear Water Services On-Call Contacts		
Todd Toland *Operations Supervisor, CWS*	Mobile: (425) 754-5973	Todd.Toland@clearwaterservices.com
Dave Carrico *Primary Field Technician, CWS*	Mobile: (425) 754-1345	Dave.Carrico@clearwaterservices.com
John Mandelin *Project Manager, CWS*	Mobile: (425) 583-1170	John.Mandelin@clearwaterservices.com
Emergency Contacts		
24 hour Facility Number		(206) 933-2265
Seattle Fire Department		Emergency: 911 Non-Emergency: (206) 386-1400
Seattle Police Department		Emergency: 911 Non-Emergency: (206) 625-5011
WA Emergency Management Division		(800) 258-5990
National Response Center		(800) 424-8802
WA State Department of Ecology, Water Quality Section		(425) 649-7033
Environmental Emergency Response Contractor: PSC Environmental Services		(206) 227-0311
Environmental Emergency Response Contractor: NRC Environmental Services		24 Hour: 1-631-224-9141, EXT. 0 Seattle Office: (206) 607-3000

4 PRINCIPAL DESIGN CRITERIA

Under WAC 173-220-150 (1)(g), neither flows nor waste loadings may exceed approved design criteria. Nucor conducted an AKART Analysis in 1996. Based on the analysis, Ecology determined the most appropriate and reasonable treatment system for the facility to be "baseline flow treatment with

particulate removal and activated carbon adsorption at a rate of 250 gpm." Ecology approved the subsequent engineering report, which provided the design and sizing calculations for the proposed treatment system (Golder Associates, 1996).

Table 3: Principal Design Criteria

Parameter	Design Quantity
Maximum design flow rate	250 gpm

4.1 EFFLUENT LIMITS

Nucor's NPDES permit specifies the following effluent limits in the discharge to Elliot Bay from Outfall 001:

Table 4: Effluent Limits

Parameter [a]	Average Monthly [b]	Maximum Daily [c]
Total Flow	---	360,000 gpd (250 gpm)
pH	Within the range of between 6.0 and 9.0 standard units	
PCBs[d]	0.05 µg/L (see footnote "d")	0.05 µg/L (see footnote "d")

[a] The effluent limitations do not apply during periods of overflow of Longfellow Creek into the stormwater conveyance system, or of heavy storm events where flow into the treatment system exceeds 250 gpm. Nucor must notify Ecology of this overflow condition within 48 hours of its occurrence if it observes the overflow during normal working hours, and must follow up with a written report within five days of occurrence of the overflow.

[b] The average monthly effluent limitation is defined as the highest allowable average of daily discharges over a calendar month, calculated as the sum of all daily discharges measured during a calendar month divided by the number of daily discharges measured during that month.

[c] The maximum daily effluent limitation is defined as the highest allowable daily discharge.

[d] The average monthly and daily maximum effluent limitations are set at the method detection level (MDL) for PCBs. The MDL for PCBs is 0.01 µg/L and the quantitation level (QL) for PCBs is 0.05 µg/L, using EPA method number 608. The QL will be used for assessment of compliance with these effluent limits. If the measured effluent concentration is below the MDL, Nucor shall report "ND" for non-detectable on the Discharge Monitoring Report form. If the measured effluent concentration is below the QL, Nucor shall report "NQ" for not quantifiable on the Discharge Monitoring Report form. If Nucor is unable to attain the specified MDL and QL in its effluent due to matrix effects, Nucor shall submit a matrix specific MDL and QL to Ecology immediately. The matrix specific MDL and QL shall be calculated as follows: 1) MDL = 3.14 x (standard deviation of 7 replicate spiked samples); 2) the QL = 5 x MDL. Check standards at concentrations equal to the QL shall be analyzed alongside all compliance monitoring samples. Check standards shall be produced independently of calibration standards and maintained as a part of Nucor's records. All check standard recovery data and duplicate measurements shall be submitted to Ecology in the Discharge Monitoring Report.

4.2 MIXING ZONE AUTHORIZATION

A mixing zone is an area where wastewater discharged from a permitted facility enters and mixes with a stream or water body. A mixing zone is an established area where water quality standards may be exceeded as long as acutely toxic conditions are prevented and all beneficial uses, such as drinking water, fish habitat, recreation, and other uses are protected. The mixing zones authorized for Outfall 001 are described below.

Chronic Mixing Zone

The mixing zone is a circle with radius of 200 feet measured from the center of each discharge port. The mixing zone extends from the sea bed to the top of the water surface. Chronic aquatic life criteria and human health criteria must be met at the edge of the chronic mixing zone.

Acute Mixing Zone

The acute mixing zone is a circle with radius of 20 feet measured from the center of each discharge port. The mixing zone extends from the seabed to the top of the water surface. Acute aquatic life criteria must be met at the edge of the acute zone.

Table 5: Authorized Mixing Zone Dilution Factors

	Available Dilution (dilution factor)
Acute Aquatic Life Criteria	11
Chronic Aquatic Life Criteria	30

5 PROCESS DESCRIPTIONS

5.1 PROCESS NARRATIVE

Baseline flow from the gravity drained conveyance system enters a concrete vault known as the junction box which serves as the collection point for all water discharged from the site under the permit.

In the junction box, gaseous CO_2, supplied from a liquid CO_2 tank, is injected through a perforated diffuser into the water for pH adjustment. The pH is measured by a sensor inserted in a side stream sample line near the junction box. The pH sensor is connected to a controller that monitors the pH and controls the CO_2 flow rate through actuated feed valves.

After pH adjustment in the junction box, water is pumped to three 20,000-gallon sedimentation tanks connected in series. Water flows by gravity and momentum through the tanks. Both coagulation and flocculation chemicals are added as needed to the water prior to entering the sedimentation tanks. Retention time in the tanks varies from 80-400 minutes per tank depending on system flow rates. During this time, flocculated fine particles settle to the bottom of the tanks. The sedimentation tanks operate in series, allowing for sequentially less deposition occurrence as the water passes through the three tanks. However, the system can be operated with three, two or one of the tanks in service at any one time. This is the case during maintenance of the tanks (i.e. sediment cleanout).

From the sedimentation tanks, the water is pumped to one of the two redundant sets of four 36-inch diameter sand filter units. The sand filter effluent is continuously monitored, using an inline turbidity

sensor to maintain the sand filter and carbon filter integrity. After flowing through the sand filter vessel, the filtered water is sent to a duplex bag filter vessel assembly which is used to remove additional solids as the water flows to a 5,000-lb triplex Granular Activated Carbon (GAC) filtration system, set up in a lead-lag configuration. Only two of the three filter vessels are operated while the third is at the ready on stand-by. From the GAC vessels, water flows to the system's discharge line where it can be sent to either the plant's recycle water tank or to the discharge section of the junction box. There the discharged water enters a 1-mile long, 5-foot diameter conveyance pipe to Outfall 001 in Elliot Bay. Additionally, in bypass situations (see Section 12), water can be pumped and discharged to King County's sanitary sewer system or to two ringwalls for infiltration and storage.

The sand filters are equipped with automatic backflush systems, which flush the filtered sediment from the individual filter tanks as necessary to maintain the hydraulic capacity of the filtration media. The GAC vessels can also be manually put into backflush mode. These features allow the treatment system to operate on a continuous flow-through basis. The filter backflush water from both filters flows to either the first or second pretreatment sedimentation tank, depending upon the valve alignment.

Figure 2 shows a schematic of the treatment system. Figure 3 shows the discharge decision tree for the water from the plant and Figure 4 shows the stormwater balance for the facility.

5.2 SYSTEM COMPONENTS DESCRIPTION

5.2.1 JUNCTION BOX

The junction box serves as the collection point for water discharged from the site. The box is an open top concrete vault nominally 30 feet long by 15 feet long by 15 feet deep with the top of the junction box being about 1 foot above ground surface. It is divided into three sections, the south section, the middle section, and the north section.

In the south section, two lines (a 48-inch line to the east and at 36-inch line to the west) enter the bottom at the junction box. Water from the lines flow into the south compartment of the junction box, through a submerged underflow weir, and into the middle section of the junction box.

Located in the middle section are the water treatment intake pipes and a high water overflow weir. Water entering the middle section from the south section rises until one of two events occurs:

1. Water rises to the set point of the water treatment intake pipes, which are nominally placed 3 feet above the bottom of the junction box. The intake pipes will collect up to 250 gpm of water, which is treated in the treatment system.
2. If the flow rate through the middle section exceeds 250 gpm the water level will continue to rise until it spills over the high water overflow weir and enter the north section.

In the north section, the junction box connects to the 1-mile long 5-foot diameter shared conveyance pipe with the Port of Seattle, which conveys the discharge to Elliot Bay.

5.2.2 PH CONTROL SYSTEM

The pH control system consists of three elements:

1. **CO_2 Supply:** CO_2 for buffering pH (if required) is supplied to the system from a low pressure, insulated, bulk tank. This tank stores CO_2 in liquid form at approximately 300 pound per square inch (psi). An outside firm is contracted to maintain product inventory. The CO2 storage tanks is equipped with remotely monitored telemetry. Tank level is maintained between 20 inches (refill point) and 52 inches (full tank level).
2. **CO_2 Injection Sparging:** Gaseous CO_2 is delivered through a solenoid operated valve into the junction box water via a diffuser. The diffuser is about 5 feet long and perforated. The sparging pipe is located in the south section of the junction box.
3. **pH Sensor/Controller:** A pH sensor is located in a sample line with water flow from the discharge of the untreated water pumps. Therefore, the pH of untreated water being pumped to the settling tanks is being monitored. The pH sensor is connected to a controller, which monitors the pH signal and opens and closes the solenoid which allows CO2 flow as follows:
   - The controller is programmed to open the solenoid at a pH of 8.0 and above.
   - The controller is programmed to close the solenoid at a pH of 7.5 and below.

5.2.3 SUCTION PUMP AND FLOAT VALVE

Water enters the treatment system through the two redundant intake pipes placed in the middle section of the junction box. The intake pipes are 4-inch PVC piping reaching into the junction box. The 4-inch piping rises about 15 feet to the level of the manifold to the intake of two redundant self-priming suction pumps. One suction pump operates while the other is either being maintained/repaired or in ready back-up status.

A self-priming debris or suction pump, sucks the water from the outfall pit and pumps it to the settling tank. The suction pump is designed to pass solids which are not settled in the pit.

The suction pump is a variable frequency drive (VFD) type pump. Its speed of rotation (and corresponding volume and pressure of water being pumped) is controlled by a continuous water level sensor located in the outfall pit. The VFD is programmed to automatically increase or decrease the pump speed, and hence the discharge rates from the junction box to the settling tank. If the rate of water coming into the junction box decreases or increases, the suction pump will automatically slow down or speed up to minimize the impact on the treatment system while maximizing treatment function. The adjustments are automatic and require no operator input.

5.2.4 FLOW METERS

The suction pump discharge is routed through a magnetic flow meter that measures the flow output of the suction pump. The flow meter is powered by 120V and generates a 4-20 milliamp (mA) signal, and is connected to a LED direct readout. The flow meter serves two purposes:

1. The flow LED readout is observed to verify the performance of the suction pump.
2. Measure system flow for permit compliance.

A battery powered flow meter, located on the effluent line of the sand filters and is used for filter system monitoring and adjustments as needed. The flow is read from a GF 9900 battery-powered transmitter.

5.2.5 CHEMICAL FEED PUMPS

The chemical feed pump system consists two chemical feed pumps. One feed pump controls the flow of a coagulating chemical agent and the second pump feeds a chemical flocculent.

The first chemical feed pump injects a water clarification chemical into the untreated water in close proximity to the self-priming suction pump. The clarification chemical works to coagulate small dirt particles into large particles that will more rapidly settle out of the water in the treatment system's settling tank.

The second chemical feed pump, downstream from the first, injects a flocculation chemical into the treatment water prior to discharge in to the settling tanks. The flocculation chemical works to attract small particulate matter together to form larger particles. This also aids the particulate settling.

The coagulant feed pump ramps its speed up and down through an analogue signal that is in proportional to the suction pump speed. It delivers coagulant from a 270-gallon polyethylene tote. The flocculation chemical feed pump is supplied with chemical from a 55-gallon polyethylene drum.

5.2.6 SEDIMENTATION TANKS

The three tanks are 40 feet long and are divided into two functional zones as follows:

Mixing Zone

In the east end of the first tank the suction pump discharges water into the settling tank through a metal mesh filtration screen. The water is then allowed to swirl and flow in the eastern portion of the tank providing adequate mixing of water and chemicals.

Settling Zones

After leaving the mixing zone, the water flows through the remaining length of the first 40-foot settling tank. The sedimentation is enhanced by allowing the water to flow through two more 40-foot sedimentation tanks providing additional time for deposition.

Under baseline conditions, the sedimentation tanks are operated in series. To allow additional settling time during seasons of heavy flow, the tanks can also be operated independently to allow uninterrupted water treatment operations, while routine maintenance or repair is being conducted.

5.2.7 FILTER PUMP

At the discharge end of the last in series tank, a filter pump removes water from the tank and pumps it into the sand filter. The pump has a capacity of 250 gpm at up to 60 psi from the settling tank through the filtration systems.

The filter pump is set at a constant frequency to provide a nominal flow rate of 250 gpm to the filters. This pump is automatically started and stopped using a water level sensor located at the west end of the tank. The level settings are entered into the PLC program to allow the tank to draw the water down for a particular minimum duration required for backflush operations. The water level sensor is a clog proof bubbler type that measures the air pressure required to displace a column of water in the tank.

5.2.8 SAND FILTRATION SYSTEM

The sand filtration system is comprised of two sets (duplex) of four in-line 36-inch diameter filter vessels (tanks. This is a high-pressure self-backwashing filter with a MAXIM control box (see Attachment 10). It is installed with 120V power and 40 psi of control air pressure. The nominal flow rate for the sand filters is 250 gpm at 40 psi (+/-25%), with a backwash flow rate of around 100 gpm (+/- 15%) at a minimum of 20 psi during backflush.

As designed, the treated water flows through the upper filter header of one of the filters at a time, and is distributed evenly between all four filter tanks (when not in backflush mode). The water passes through the tanks while suspended sediment is captured by the filter bed. The filtered water flows through 1-inch stainless laterals arrayed throughout the bottom of the filter tanks.

The backflush cycle is activated by the control box when either the sand filter differential pressure exceeds the set point (typically 8 psi) or at operator-set time intervals. A three-way pneumatic actuated backflush valve, located at the top of the filter tank, is the mechanical means for backflushing. When the process is initiated, the control box signals pneumatic solenoids dedicated to each tank to activate in a sequential order for set duration and time between flush. The backflush duration, and time between backflush cycles can also be adjusted by the operator.

5.2.9 DUPLEX BAG-FILTER

A duplex Rosedale brand 30-inch stainless steel bag filter assembly is installed downstream from the sand filter to help polish the remaining solids prior to the water entering the GAC filter. This filter housing is rated to run at up to 440 gpm (150 psi) with a nominal flow of 250-gpm (at 40-psi). The 30-inch bag filters material is a polypropylene felt with a plastic collar. Filter bags will be rated between 10 to 25 micron.

5.2.10 GAC FILTRATION SYSTEM

The triplex Granular Activated Carbon (GAC) vessels provide the final component of the treatment train. Each vessel contains 5,000 pounds of GAC media, has a maximum working pressure of 75 psi, and a nominal flow rate of 250 gpm. The backwash flow rate for each vessel is also 250 gpm. The triplex GAC vessels are made of carbon steel and coated with epoxy lining on the inside and rust-preventative epoxy primer urethane finish on the exterior. The vessels interconnect can be accessed from a catwalk for servicing. An influent, effluent, and backflush header system interconnects all of the GAC vessels and allows the operator to run the filters in a number of different configurations. Gear reducing valves are included on the influent and effluent of each vessel to allow the operator to adjust the flows and pressures. This filter system is designed to run in a lead/lag mode through two of the three vessels at 250-gpm to provide a total of 10 minutes of contact time. The third vessel remains on standby to replace an operating vessel as needed. Manual butterfly valves allow the operator to redirect the water to an alternate vessel and for backflushing individual vessels.

6 OPERATIONAL OBJECTIVES AND BASELINE OPERATION

The primary operational objective of the treatment system is to ensure the effluent quality and flow requirements specified by Nucor's NPDES permit in the safest and most efficient manner. The treatment system also serves as an important operational source of the plant's overall water makeup.

6.1 BASELINE OPERATION AND MAINTENANCE

Operation of the treatment system is automated to a great degree to minimize dependency on daily operator input. Pumps speed, flow rates, pressures, and water levels are all adjusted by the system automatically. The following section describes the baseline operation and maintenance required for the system to operate correctly.

6.1.1 MAINTAIN CO_2 SUPPLY

Frequency: As needed, check weekly

The operator must inspect the digital tank level readout mounted on the supply tank. Tank level is maintained between 20 inch (refill level) and 52 inch (full tank level) by an outside contractor. The supplier should be contacted immediately if CO_2 level drops below 15 inch (low level).

6.1.2 CHECK THE FLOW CAPACITY OF THE SYSTEM SUCTION PUMP

Frequency: As needed, check weekly

The operator must check that the suction pump is able to achieve the system rate capacity of 250 gpm.

Verification of pump capacity can be performed as follows:

1. During non-storm events: The operator should look at the system flow meter and junction box overflow weir. Flow should be 250 gpm or less and no overflow from the weir should be observed.
2. During storm events: The operator should look at the system flow meter and junction box overflow weir. Flow should be 250 gpm and, if storm is large enough, overflow of the weir may be observed. A "Water Treatment Plant Observed Weir Overflow Occurrence Notice" must be completed and filed with the Department of Ecology within 48 hours of observation.
3. If flow capacity is less than 250 gpm and overflow of the weir is observed, the secondary pump must be used and the primary pump should be repaired or replaced.

6.1.3 MAINTAIN CHEMICAL SUPPLY

Frequency: As needed, check weekly

The operator must check that the chemical supply pumps have an adequate supply of flocculent and coagulant. The supply consists of one 270-gallon polyethylene tote and one 55-gallon polyethylene drum. The supply of chemical must be maintained to have one container in use and back up container in the order/delivery process or stored on site.

Verification of the supply can be performed as follows:

1. Observe the coagulant level through the side wall of the translucent 270-gallon tote.

2. Determine the flocculent level by physically shaking the 55-gallon drum.

6.1.4 ENSURE SAND FILTERS ARE BACKWASHED

Frequency: As needed, check weekly

The sand filter backwash system is a highly automated process. The operator must select a pressure differential or timer to control backwash frequency for the sand filters to keep the system running well. Clear Water recommends setting the backflush frequency using the differential pressure set at 8 psi. See Attachment 10 for instructions on setting backwash frequency using the MAXIM control box. If additional backwashing is needed before a backwash cycle is scheduled to start, the system can be manually backwashed.

Manual backwashing is performed as follows:

1. Switch the system into recirculation mode.
2. Activate backwashing cycle on the control box.
3. Open backwashing valve (automatic).
4. If necessary, adjust valve positions to increase or decrease pressure. The media manufacturer (NextSand) recommends that each tank be backflushed at 100-gpm for four minutes. A minimum of 20-psi is required during backflushing.
5. Close backwashing valve (automatic).
6. Repeat for each tank (automatic).
7. After performing a manual backflush, if necessary, change valves back to original positions to maintain proper pressures.
8. If appropriate, switch the system back into discharge mode.

6.1.5 CHECK BAG FILTERS

Frequency: As needed, check weekly

Visually check the influent and effluent bag filter housing pressures gauges to determine the differential pressure. Actual differential change-out pressure will be based upon the impact to flow which will need to be determined in the field. When checking the bag filter differential pressure, also check the effluent flow rate. For instance, if the flow has dropped below 260 gpm and the differential pressure is greater than 6-psi, then the bags should be checked and will likely require replacement. Before checking the bags, turn the treatment system off and isolate the bag filter housing by closing the influent and effluent ball valves.

6.1.6 ENSURE GAC VESSELS ARE NOT CLOGGED

Frequency: As needed, check weekly

The operator must make sure the GAC filters are not clogged or fouled. Visually inspect each filter vessel influent and effluent pressures to evaluate the differential pressure. Check the battery powered flow meter to determine whether the flow is being reduced. For instance, if the flow has dropped belo 260 gpm and the differential pressure is greater than 6-psi, then then that particular tank should be

checked backflushed manually. This is done by switching the appropriate valves to redirect the influent water to the GAC vessel to flow into the bottom and out the top.

GAC tank backflushing is performed as follows:

1. Turn the filter pump off.
2. Switch the butterfly valves to direct bag filter effluent water to the bottom of the tank, out the top and to backflush.
3. Turn the filter pump back on and adjust the influent and effluent gear reducing valves as needed to provide 40-psi of pressure at 250-gpm.
4. Collect a 1-L backflush sample in a 1-L beaker and inspect for carbon granules. Some granules within the sample are expected. If there are more than a couple dozen granules in the sample, the flows and/or pressures should be reduced to limit loss of media.
5. Continue backflushing and monitoring for approximately 10 minutes per tank.
6. Turn the filter pump off after finishing backflushing.
7. Set the butterfly valves to the desired lead-lag configuration.
8. Turn the sand filter pump back on.
9. Adjust the gear reducing valves to maintain 40-psi and 250-gpm.

6.1.7 SAND FILTER MEDIA REPLACEMENT

Frequency: As needed and fully replace approximately every one to two years depending upon water quality and quantity

The operator must check that the sand filters have sufficient quantity of NextSand media for operation, and that the media is not impacted. Abnormal pressures and effluent can indicate impacted (i.e. high influent pressure with more than 8 psi differential pressure) or low levels of media (i.e. low influent pressures and low differential pressures) in the filters. If the media is suspected to be impacted or low, perform a visual inspection of the media.

To inspect the media:

1. turn the filter pump off and relieve the pressure from the sand filter skid by opening the drain port at the bottom header.
2. Isolate the filter skid from the rest of the system by closing valves to ensure that the sediment tank does not drain.
3. Remove the filter tank access hatch and take a look at the filter bed. Grab a sample of the media and check the general condition.

If there appears to be significant upper layer sediment, then the filter bed should be raked. Look for holes within the media layer which would indicate improper filter pressures or impacted sediments. Add media to the filter tank if the media is still good, but just low. The void space above the filter media level should be about 36-inches. If the media cannot be cleared of sediment, then follow the replacement procedure below.

Replacement occurs as follows:

1. Turn the filter pump off or redirect the flow from the impacted filter through the backup filter skid. First open the gear reducing valves on both of the backup filter headers, and then close the gear reducing valves on the impacted filter. Adjust the flows and pressures to the optimal setting.
2. Open the filter valve drain port.
3. Open each of the sand filter tank access ports.
4. Remove old media with vacuum equipment and dispose of according to state and local laws.
5. Check the inside of the filter for any needed maintenance and repair. Open the side manway and remove the filter laterals. Inspect the tank lining for any pitting or corrosion.
6. Pressure wash the laterals to remove any grit that may be lodged within the screen material.
7. Add approximately 9-inches of washed ¾-inch filter rock through the side manway, or enough to cover the tank bottom laterals with two or three inches of gravel. Close the side manway.
8. Fill each tank with approximately 36-inches of NextSand media. An additional approximately 36-inches of void space should be left within the tank to allow for proper bed fluidization and backflushing.
9. Rake out and level the filter media.
10. Close the top access hatches.
11. The filter is now ready for service.

6.1.8 BAG FILTER REPLACEMENT

Frequency: As needed, checked per Section 6.1.5

If the flow has dropped by more than 10%, and the differential pressure between the upper and lower bag filter headers are greater than 6-psi, then the bags should be checked and will likely require replacement. (See Attachment 12)

Replacement occurs as follows:

1. Turn the filter pump off and close the influent and effluent ball valves to isolate the bag filter assembly.
2. Safely relieve the pressure prior to opening.
3. Open the bottom drain valve on both housings and allow the water to drain.
4. Remove the cover by loosening eye nuts.
5. Remove filter basket and clean with thoroughly.
6. Remove filter bag and dispose.
7. Check inlets and outlets for debris and remove as necessary.
8. Check basket seals and replace if needed.
9. Insert the filter baskets and fully extended bag filters.
10. Close the cover hatch.
11. Open the inlet and outlet ball valves and restart the filter pump.

12. Check flows and pressures.

6.1.9 GRANULAR ACTIVATED CARBON REPLACEMENT

Frequency: As needed, checked per Section 5.1.6

The operator must check that the GAC filters have sufficient quantity of media for operation, that the media is not impacted and contaminant breakthrough has not occurred. Abnormal pressures and effluent can indicate impacted (i.e. high influent pressure with more than 8 psi differential pressure) or low levels of media (i.e. low influent pressures and low differential pressures) in the filters. If the media is suspected to be clogged or low, perform a visual inspection of the media.

To perform an inspection:

1. turn the filter pump off and relieve the pressure from the GAC vessel by opening the drain port at the bottom of the tank.
2. Isolate the vessel from the rest of the system by closing valves to ensure that only the GAC vessel drains.
3. Remove the filter tank access hatch and take a look at the filter bed. Grab a sample of the media and check the general condition.

If there appears to be significant upper layer sediment, then the filter bed should be raked. Look for holes within the media layer which would indicate improper filter pressures or impacted sediments. Add media to the filter tank if the media is still good, but just low. If the media cannot be cleared of sediment or contaminant breakthrough has occurred, then follow the replacement procedure below.

Replacement occurs as follows:

1. Turn the filter pump off and isolate the vessel by closing the influent and effluent valves.
2. Open the filter valve drain port.
3. Open the upper filter access port.
4. Remove old media with vacuum equipment and dispose of according to state and local laws.
5. Check the inside of the filter for any needed maintenance and repair. Open the side manway and remove the filter laterals. Inspect the tank lining for any pitting or corrosion.
6. Pressure wash the laterals to remove any grit that may be lodged within the screen material.
7. Close the side manway.
8. Using a forklift, fill each tank with approximately 5,000-lbs of GAC media.
9. Rake out and level the filter media.
10. Close the top access hatches.
11. Soak the GAC filter media with sand filter effluent for a minimum of one to two days.
12. Rinse the GAC media while in recirculation mode until the effluent pH is less than 9.0 SU.
13. After changing out the media in one vessel, open and close the appropriate butterfly valves on the triplex header such that the sand filtered water now first enters the lag vessel (and becomes lead) followed by the backup vessel (which becomes the lag).
14. Turn the filter pump on and readjust the gear valves to maintain the proper pressures and flows.

15. The vessel with new media now becomes the backup vessel.

6.1.10 CLEAN SEDIMENTATION TANKS

Frequency: As needed, check monthly

Use a "sludge judge" to check the settled sediment within the three 20,000 gallon tanks. Take sludge level readings from the back, middle and front areas of the tanks. Sludge should be removed whenever sludge causes treatment issues or when the sludge buildup occupies more than 3 feet of the tank level.

While the cleaning frequency will be dependent upon both the water quality and quantity over a give duration, it is estimated that a minimum of one cleaning will be required per year.

Cleaning will be done as follows:

1. Close valves to isolate the tank to be cleaned.
2. Pump down the tank water to sludge level using a bottle pump to transfer to another tank.
3. During cleaning of one settling tank, redirect all incoming water to one of the other redundant tanks.
4. Call a vactor truck company in advance to determine whether sediment analytical testing will be required prior to disposal.
5. Make sure that the vactor company brings the appropriate equipment including specific hoses/fittings.
6. Discharge sludge for disposal according to local and state regulations.

6.1.11 PH PROBE CALIBRATION

Frequency: Monthly

pH checks are conducted monthly with a calibration standard solutions to check for drift on the main probe. If check indicates that the probe has drifted, a 2-point calibration is completed. If probe is unable to be calibrated it is changed.

6.1.12 CLEAN CO2 DIFFUSER

Frequency: As needed, check weekly

The diffuser can become covered in sediment. If it becomes fouled, it can be unplugged by:

1. Lift diffuser above water surface.
2. Use high pressure hose to wash sediment off.
3. Lower diffuser into water.

6.1.13 FLOW METER CALIBRATION

Frequency: Annually

For measuring raw water flow, a Krohne flow meter is used. Annual verification/testing will be performed on the unit with a MagCheck field test device to confirm accuracy of the measurement value

within 1% of the initial calibration data. If the measurement is greater than 1% error, as defined by the manufacturer, the unit will be recalibrated by the manufacturer.

6.2 MAINTENANCE SCHEDULE

Table 6 below shows summarizes the maintenance schedule for the treatment system.

Table 6: Maintenance Schedule

Activity	Description/Reference	Schedule
Maintain CO_2 Supply	See Section 6.1.1	Check weekly, fill as needed, and at startup
Check the Flow Capacity of the System Suction Pump	See Section 6.1.2	Check weekly, repair as needed, and at startup. Pump is replaced every 4 years.
Maintain Chemical Supply	See Section 6.1.3	Check Weekly, fill as needed, and at startup.
Ensure Sand Filters are Backwashed	See Section 6.1.4	Perform weekly, as needed, and at startup
Check Bag Filters	See Section 6.1.5	Weekly, as needed, and at startup
Ensure GAC Vessels are Not Clogged	See Section 6.1.6	Check weekly, replace as needed, and at startup
Sand Filter Media Replacement	See Section 6.1.7	Check monthly, replace as needed
Bag Filter Replacement	See Section 6.1.8	Replace as needed
GAC Replacement	See Section 6.1.9	Check monthly, replace as needed
Clean Sedimentation Tanks	See Section 6.1.10	Check monthly, clean as needed
pH Probe Calibration	See Section 6.1.11	Verify monthly, calibrate as needed
Clean Diffuser	See Section 6.1.12	Check weekly, clean as needed
Flow Meter Calibration	See Section 6.1.13	At startup and at least annually
Replace East Sediment Tank Pump	Send to manufacturer for overhaul or replacement	As needed at failure of first redundant component
Replace West Sediment Tank Pump	Send to manufacturer for overhaul or replacement	As needed at failure of first redundant component
Replace South Junction Box Pump	Send to manufacturer for overhaul or replacement. System is equipped with redundant components.	As needed at failure of first redundant component
Replace North Junction Box Pump	Send to manufacturer for overhaul or replacement. System is equipped with redundant components.	As needed at failure of first redundant component

7 SHUTDOWN, UPSETS AND LESS THAN DESIGN LOADING OPERATIONS

The system has designed to minimize the potential for upsets. Pumping rates, pressures, and water levels are largely automated, use reliable components, and reliably work. The facility is prepared to

respond to unplanned upsets. The plant is staffed 24 hours per day with a staff of qualified electrician, mechanics, and maintenance experts to conduct normal steel manufacturing. These persons are available on short; if not immediate, basis should upsets occur. The follow table describes responses to typical upsets:

Table 7: System Upset Response Matrix

Possible Upset	Result	Prevention	Mitigation/repair
Power failure or loss of plant air pressure.	Continued operation on auxiliary power.	Water treatment plant is connected to an emergency generator and air compressor that start automatically.	N/A
Failed pumps or piping	Loss of system flow capacity with tank overflow or loss of water. Tank overflow triggers alarm.	Components are checked weekly.	All piping parts are standard and either stocked or available within 24 hours. Existing staff are trained to install and repair all equipment in system. Redundant pumps exist.
Premature failure of filtration capacity in sand filters	Water only treated with a portion of the filters Loss of system flow capacity with tank overflow or loss of water. Tank overflow triggers alarm.	Operator routinely checks NextSand media and refills sand filters as needed	Redundant filter tanks provide filtration until affected filter is repaired. Onsite staff are trained to perform change out rapidly.
Premature failure of GAC vessel	Loss of system flow capacity with tank overflow or loss of water. Tank overflow triggers alarm.	The triplex carbon system is oversized and redundant to minimize risk. Vessels are inspected frequently to prevent buildups	Redundant vessels provide filtration until affected vessel is repaired. GAC is stocked on site or available in 3-5 days. Onsite staff is trained to perform change out rapidly.
Both sand filters and GAC vessels prematurely fail	Water will be treated with settling tank and redundant filters/vessels	Both sets of filters routinely inspected. Both unlikely to fail simultaneously.	System designed with redundancy. Onsite staff is trained to perform repairs and maintenance.
Settling tank malfunction stops	Water will be redirected to secondary settling tank.	Routine inspection of tank performed.	Secondary settling tank will still treat

settling from occurring			water while repairs are made. Not immediate impact on water quality.

8 NON-ROUTINE AND MAINTENANCE RELATED DISCHARGES

The permit authorizes non-routine and unanticipated discharges under certain conditions. Nucor must characterize these waste waters for pollutants and examine the opportunities for reuse. Depending on the nature and extent of pollutants in this wastewater and on any opportunities for reuse, Ecology may:

- Authorize the facility to discharge the wastewater.
- Require the facility to treat the wastewater.
- Require the facility to reuse the wastewater.

Prior to any such discharge, Nucor must contact Ecology and, **at a minimum,** provide the following information:

1. The proposed discharge location.
2. The nature of the activity that will generate the discharge.
3. Any alternatives to the discharge, such as reuse, storage, or recycling of the water.
4. The total volume of water it expects to discharge.
5. The results of the chemical analysis of the water. Nucor must analyze the water for all constituents limited for the discharge. The analysis must include any parameters deemed necessary by Ecology. All discharges must comply with the effluent limits as established in Condition S1 of this permit, water quality standards, and any other limits imposed by Ecology.
6. The date of proposed discharge.
7. The expected rate of discharge discharged, in gallons per day. Nucor must limit the discharge rate so it will not cause erosion of ditches or structural damage to culverts and their entrances or exits.

The discharge cannot proceed until Ecology has reviewed the information provided and has authorized the discharge by letter to Nucor or by an Administrative Order. Once approved, and if the proposed discharge is to a municipal storm drain, Nucor must obtain prior approval from the municipality and notify it when it plans to discharge.

9 SAMPLING AND LABORATORY ANALYTICAL PROCEDURES

Nucor must monitor the effluent in accordance with the following schedule and must use the laboratory method, and meet the detection level (DL), and quantitation level (QL) specified in Appendix A of the NPDES Permit (see Attachment 1 of this document), unless it is specified in S1 and S2.A of the permit. Nucor may use alternative methods included in 40 CFR Part 136 if the DL and QL are equivalent to those specified in Appendix A or if the alternative method's DL and QL are low enough to detect the parameter.

Table 8: Monitoring Schedule

Parameter[4]	Units	Minimum Sampling Frequency	Sample Type
Outfall 001			
Total Flow	Gpd	Monthly	Meter[2]
Oil and Grease	mg/L	Quarterly	Grab [1]
pH [3]	Standard Units	Monthly	Grab [1]
Temperature	°C	Batch	Grab [1]
Copper (total)	µg/L	Monthly	Grab [1]
Cadmium (total)	µg/L	Quarterly	Grab [1]
PCBs	µg/L	Monthly	Grab [1]

[1]Grab means an individual sample collected over a 15-minute, or less, period.

[2]Monitoring flow by meter is required for treated wastewater. Bypass flows may be estimated

[3] pH may be monitored in-house using pH paper or EPA Method 150.1. The results must be recorded in a logbook, which will be made available to the inspector(s).

[4] See Appendix A for the required detection limit (DL) or quantitation levels (QL).
Nucor must report single analytical values below detection limit as "less than (detection level)" where (detection level) is the numeric value specified in Attachment A.
Nucor must report single analytical values between the agency-required detection and quantitation levels with qualifier code of "j" following the value. The calculated value (monthly average) should be reported as follows:

- Use the reported numeric value for all parameters measured between the agency-required detection value and the agency-required quantitation value.
- For values reported below detection, use one-half the detection value if the lab detected the parameter in another sample for the reporting period.

For values reported below detection, use zero if the lab did not detect the parameter in another sample for the reporting period. If Nucor is unable to obtain the required DL and QL in its effluent due to matrix effects, Nucor must submit a matrix-specific MDL and a QL to Ecology with

9.1 SAMPLING

Samples and measurements taken to meet the requirements of this permit must represent the volume and nature of the monitored parameters, including representative sampling of any unusual discharge or discharge condition, including bypasses, upsets, and maintenance-related conditions affecting effluent quality.

Sampling and analytical methods used to meet the monitoring requirements specified in this permit must conform to the latest revision of the *Guidelines Establishing Test Procedures for the Analysis of Pollutants* contained in 40 CFR Part 136.

All samples, other than the in-line flow meter, are collected from the discharge.

9.2 ANALYSIS

Nucor must ensure that all monitoring data required by Ecology is prepared by a laboratory registered or accredited under the provisions of Chapter 173-50 WAC, *Accreditation of Environmental Laboratories.* Flow, temperature, settleable solids, conductivity, pH, and internal process control parameters are exempt from this requirement.

10 REPORTING, NOTIFICATIONS AND RECORDKEEPING

Nucor must monitor and report in accordance with the following conditions. The falsification of information submitted to Ecology is a violation of the terms and conditions of the permit.

10.1 REPORTING

The first monitoring period begins on the effective date of the permit. Nucor must:

1. Submit monitoring results each month.
2. Summarize, report, and submit monitoring data obtained during each monitoring period on a Discharge Monitoring Report (DMR) form provided, or otherwise approved, by Ecology.
3. Submit DMR forms monthly whether or not the facility was discharging. If the facility did not discharge during a given monitoring period, submit the form as required with the words "NO DISCHARGE" entered in place of the monitoring results.
4. Ensure that DMR forms are postmarked or received no later than the 30th day of the month following the completed monitoring period, unless otherwise specified in this permit.
5. Send reports to Ecology at:
   Water Quality Permit Coordinator
   Department of Ecology
   Northwest Regional Office
   3190 160th Avenue SE
   Bellevue, WA 98008-5452

All laboratory reports providing data for organic and metal parameters must include the following information: sampling date, sample location, date of analysis, parameter name, CAS number, analytical method/number, method detection limit (MDL), laboratory quantitation limit (QL), reporting units, and concentration detected. Analytical results from samples sent to a contract laboratory must have information on the chain of custody, the analytical method, QA/QC results, and documentation of accreditation for the parameter.

In addition to DMRs, Nucor must review the TSOP annually and confirm this review by submission of a letter to Ecology. Nucor must also submit to Ecology, for review, substantial changes or updates to the TSOP whenever it incorporates them into the manual.

10.2 RECORDKEEPING

Nucor must retain records of all monitoring information for a minimum of three years. Such information must include all calibration and maintenance records and all original recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to

complete the application for this permit. Nucor must extend this period of retention during the course of any unresolved litigation regarding the discharge of pollutants by Nucor or when requested by Ecology.

10.3 RECORDING OF RESULTS

For each measurement or sample taken, Nucor must record the following information:

1. The date, exact place, method, and time of sampling or measurement.
2. The individual who performed the sampling or measurement.
3. The dates the analyses were performed.
4. The individual who performed the analyses.
5. The analytical techniques or methods used.
6. The results of all analyses.

10.4 ADDITIONAL MONITORING

If Nucor monitors any pollutant more frequently than required by Condition S2 of the permit, then Nucor must include the results of such monitoring in the calculation and reporting of the data submitted in Nucor's DMR.

10.5 REPORTING PERMIT VIOLATIONS

Nucor must take the following actions when it violates or is unable to comply with any permit condition:

- Immediately take action to stop, contain, and cleanup unauthorized discharges or otherwise stop the noncompliance and correct the problem.
- If applicable, immediately repeat sampling and analysis. Submit the results of any repeat sampling to Ecology within thirty (30) days of sampling.

10.5.1 24 Hour Reporting

Nucor must report the following occurrences of noncompliance by telephone, to Ecology at 425-649-7000, within 24 hours from the time Nucor becomes aware of any of the following circumstances:

- Any noncompliance that may endanger health or the environment.
- Any unanticipated bypass that exceeds any effluent limitation in the permit (see permit section Part S4.B, "Bypass Procedures").
- Any **upset** that exceeds any effluent limitation in the permit (See permit section G.15, "Upset").
- Any violation of a maximum daily or instantaneous maximum discharge limitation for any of the pollutants in Section S1.A of the permit.
- Any overflow prior to the treatment works, whether or not such overflow endangers health or the environment or exceeds any effluent limitation in the permit.

10.5.2 REPORT WITHIN 5 DAYS

Nucor must also provide a written submission within five days of the time that Nucor becomes aware of any event required to be reported under subparts 1 or 2, above.

The written submission must contain:

- A description of the noncompliance and its cause.
- The period of noncompliance, including exact dates and times.
- The estimated time noncompliance is expected to continue if it has not been corrected.
- Steps taken or planned to reduce, eliminate, and prevent recurrence of the noncompliance.
- If the noncompliance involves an overflow prior to the treatment works, an estimate of the quantity (in gallons) of untreated overflow.

10.5.3 WAIVER OF WRITTEN REPORTS

Ecology may waive the written report required in subpart 2, above, on a case-by-case basis upon request if a timely oral report has been received.

10.5.4 ALL OTHER PERMIT VIOLATION REPORTING

Nucor must report all permit violations, which do not require immediate or within 24 hours reporting, when submitting monitoring reports.

11 EQUIPMENT AND MATERIALS INVENTORY

Attachment 2 of this document contains the material and equipment list for the major system components. This list shall be amended as necessary to reflect the current components of the system.

12 HEALTH AND SAFETY

Any employee whose job requires them to operate or maintain the water treatment system will be safety trained prior to conducting any operations or maintenance of the system. This training will be completed in the New Employee Safety and Health Orientation and covers the following topics:

- Lockout/Tagout/Tryout
- Fall Protection
- Confined Space procedures
- Hazard Communications
- Personal Protective Equipment

Each employee will be provided with the appropriate PPE for these functions. This PPE may include, but is not limited to: safety glasses, fall protection, ear plugs/muffs, "greens" or appropriate coveralls, and appropriate gloves.

Additionally, any employee whose job requires them operate or maintain the water treatment system shall be trained on more specific hazards they might face via the Safe Job Procedures of any task they are required to perform.

13 EMERGENCY PROCEDURES

In the event of an emergency, bypass may be required. Bypass is the intentional diversion of waste

water from the treatment system to another means of discharge management. Nucor has two options for bypass. These bypass options are described below.

13.1 DISCHARGE TO THE KING COUNTY SANITARY SEWER SYSTEM

In the past, Nucor has been permitted to discharge untreated stormwater and ground water infiltrate to the sanitary sewer during planned maintenance outages of the stormwater treatment system, and during unplanned emergency outages. In 2009, King County informed Nucor that they no longer can accept these infrequent bypass discharges because they have concerns with the PCB concentration in the untreated water.

To manage the water during planned maintenance events, Nucor worked with King County to address the PCB issue so that Nucor can continue to discharge contaminated stormwater to the sanitary sewer system when necessary. King County informed Nucor that they would grant permission to discharge wastewater only if the water is treated with granulated activated carbon, and pre-approval from King County is obtained for each event prior to discharge. Nucor submitted a work plan with data to King County, demonstrating that two carbon units would be sufficient to treat the discharge. To address unplanned emergency power outage incidents, Nucor designed and installed a backup generator to provide power to the treatment system. This emergency power unit is currently in operation.

The requirements to discharge to the King County Sanitary Sewer System are detailed in Attachment 2: Major Discharge Authorization, King County Industrial Waste Program, and Authorization # 4012-03.

13.2 DISCHARGE TO THE RINGWALLS

The ringwalls are circular concrete walls constructed on compacted fill material, for use as temporary holding structures and infiltration basins for stormwater. They are located just north of the plant on the opposite side of the West Seattle Freeway (see Figure 1).

The ringwalls were formerly used as a secondary containment for aboveground fuel oil storage tanks. The storage tanks were removed thirty years ago. The east and west ringwalls (ringwall E and ringwall W) are reinforced concrete circular walls constructed on compacted fill material. Ringwall E and ringwall W are approximately 112 and 104 feet in diameter, respectively. Both ringwalls are about 12 feet high, with walls about 10 inches thick. The floor of ringwall E was sealed with pavement in 2009, so that it could be used to hold sludge from various locations prior to being hauled off-site for disposal. The floor of ringwall W is composed of slag fill, with a central area approximately 60 feet in diameter covered with crushed gravel and sand. The ringwalls are about 6 feet apart. A structural integrity review test was performed for the ringwalls in 1994 as part of the engineering report. The test indicated the integrity of the ringwalls to be intact.

The water pumped to the ringwalls would infiltrate the underlying soil at the base of the ringwalls. The pilot-scale infiltration test conducted as part of the above-referenced engineering report in 1994 indicated a design infiltration rate during saturated conditions (vertical velocity) of 2.35 inches per hour.

Ground water in this shallow aquifer unit generally flows to the north and east where it discharges into Elliott Bay. In the area of the proposed infiltration, the horizontal direction of flow in the shallow fill is

generally to the east. Ground water flow direction in the fill is strongly influenced by the presence of the permeable gravel fill materials used to backfill the 72-inch storm drain. The low elevation of the pipe (approximately sea level) and the surrounding soil's apparent hydraulic connection to the gravel backfill creates a ground water discharge area. Water level elevation contours indicate the ground water flow direction in this area is toward the 72-inch storm drain, and ultimately to Elliott Bay.

13.3 BYPASS PROCEDURES

The permit prohibits a bypass which is the intentional diversion of waste streams from any portion of a treatment facility. Ecology may take enforcement action against Nucor for a bypass unless one of the following circumstances (1, 2, or 3) applies.

1. Bypass for essential maintenance without the potential to cause violation of permit limits or conditions. Bypass is authorized if it is for essential maintenance and does not have the potential to cause violations of limits or other conditions of this permit, or adversely impact public health as determined by Ecology prior to the bypass. Nucor must submit prior notice, if possible, at least ten (10) days before the date of the bypass. Bypass is authorized if it is for essential maintenance and King County has been contacted and refuses to accept the discharge of untreated wastewater to their sanitary sewer system. As an alternative, Nucor is allowed to discharge its wastewater to the existing ringwalls which are located north of the site (Figure 2, more description in the fact sheet).
2. Bypass which is unavoidable, unanticipated, and results in noncompliance of this permit.
   This bypass is permitted only if:
   - Bypass is unavoidable to prevent loss of life, personal injury, or severe property damage. "Severe property damage" means substantial physical damage to property, damage to the treatment facilities which would cause them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass.
   - No feasible alternatives to the bypass exist, such as:
     - The use of auxiliary treatment facilities.
     - Retention of untreated wastes.
     - Stopping production.
     - Maintenance during normal periods of equipment downtime, but not if Nucor should have installed adequate backup equipment in the exercise of reasonable engineering judgment to prevent a bypass.
     - Transport of untreated wastes to another treatment facility or preventative maintenance, or transport of untreated wastes to another treatment facility.
   - Ecology is properly notified of the bypass as required in Condition S3.E of this permit
   - expected to occur in the absence of a bypass.
3. If bypass is anticipated and has the potential to result in noncompliance of this permit, Nucor must notify Ecology at least thirty (30) days before the planned date of bypass. The notice must contain:

- A description of the bypass and its cause.
- An analysis of all known alternatives which would eliminate, reduce or mitigate the need for bypassing.
- A cost-effectiveness analysis of alternatives, including comparative resource damage assessment. The minimum and maximum duration of bypass under each alternative.
- A recommendation as to the preferred alternative for conducting the bypass.
- The projected date of bypass initiation.
- A statement of compliance with SEPA.
- A request for modification of water quality standards as provided for in WAC 173-201A-410, if an exceedance of any water quality standard is anticipated.
- Details of the steps taken or planned to reduce, eliminate, and prevent reoccurrence of the bypass.

For probable construction bypasses, Nucor must notify Ecology of the need to bypass as early in the planning process as possible. Nucor must consider the analysis required above during preparation of the engineering report or facilities plan and plans and specifications and must include these to the extent practical. In cases where Nucor determines the probable need to bypass early, Nucor must continue to analyze conditions up to and including the construction period in an effort to minimize or eliminate the bypass.

13.4 EMERGENCY RESPONSE

Nucor has developed a plant-wide Emergency Response Plan for the facility in accordance with various requirements. In the event of an emergency such as a natural disaster, fire, injury, chemical spill or hazardous materials release, the Emergency Response Plan will be implemented. All employees are trained on the emergency response procedures and the written plan is available physically at various locations within the facility as well as electronically at each computer work station.

Revision #:

Revision Date:

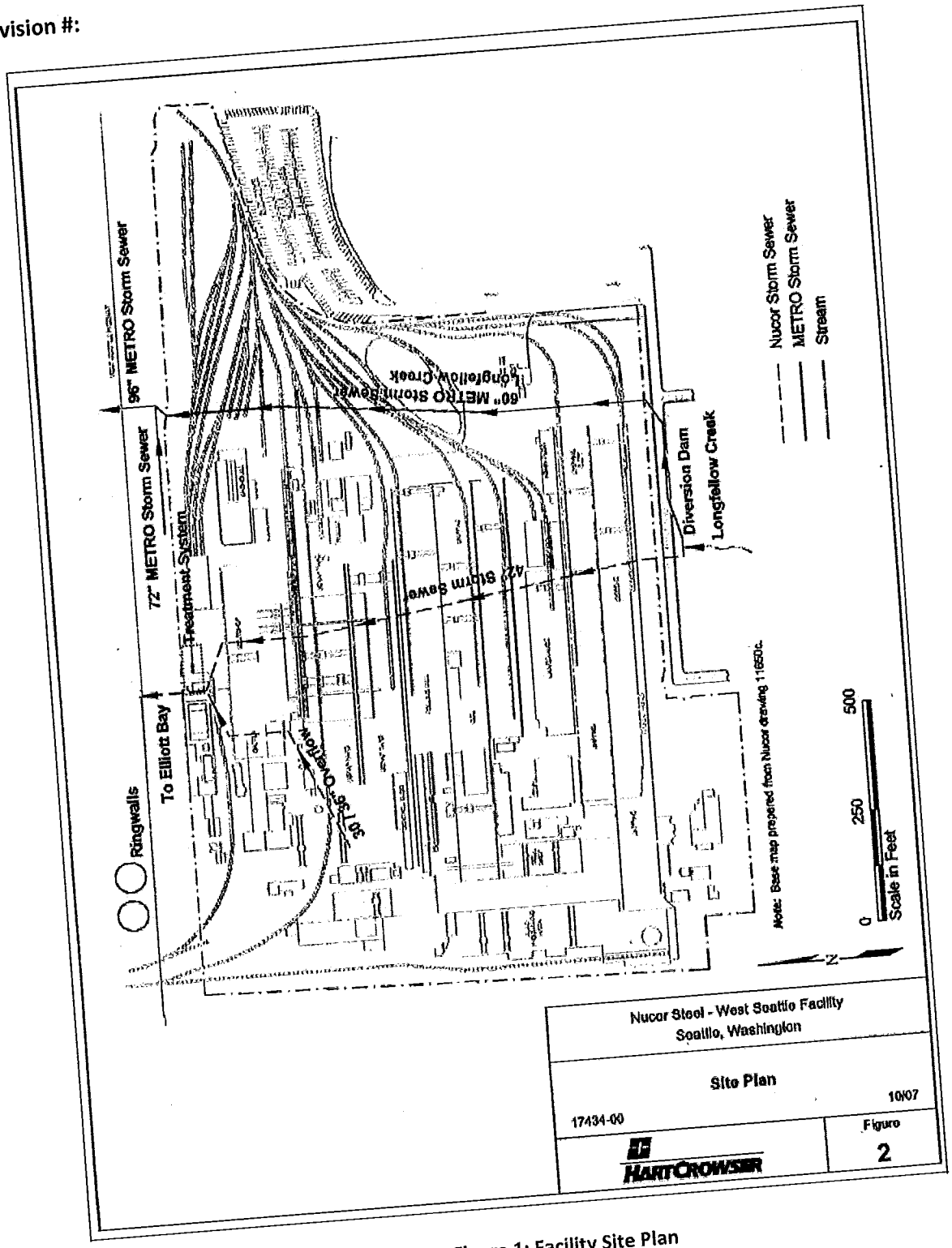


Figure 1: Facility Site Plan

Printed By:

Print Date:

Document Status:

Document Type:

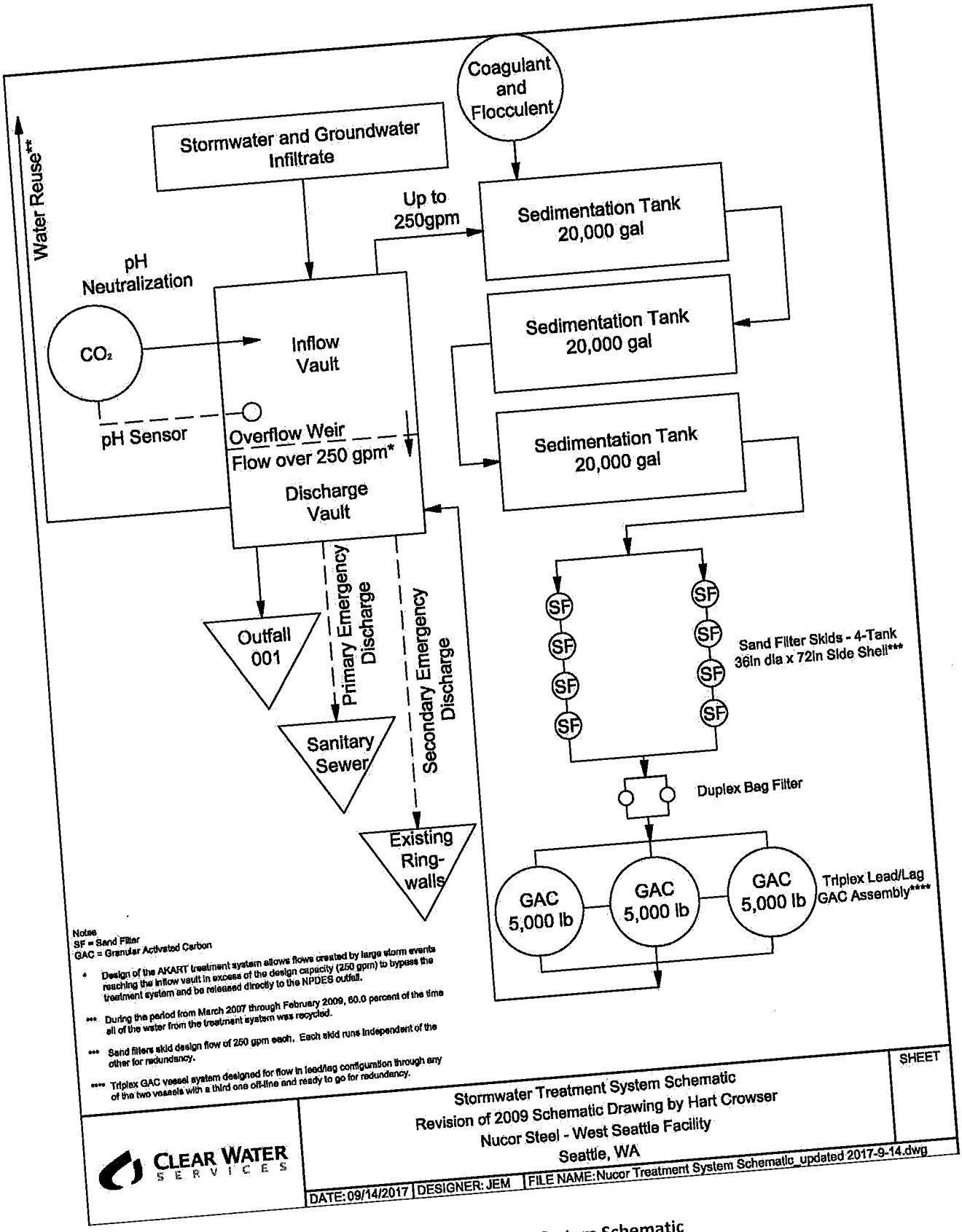


Figure 2: Treatment System Schematic

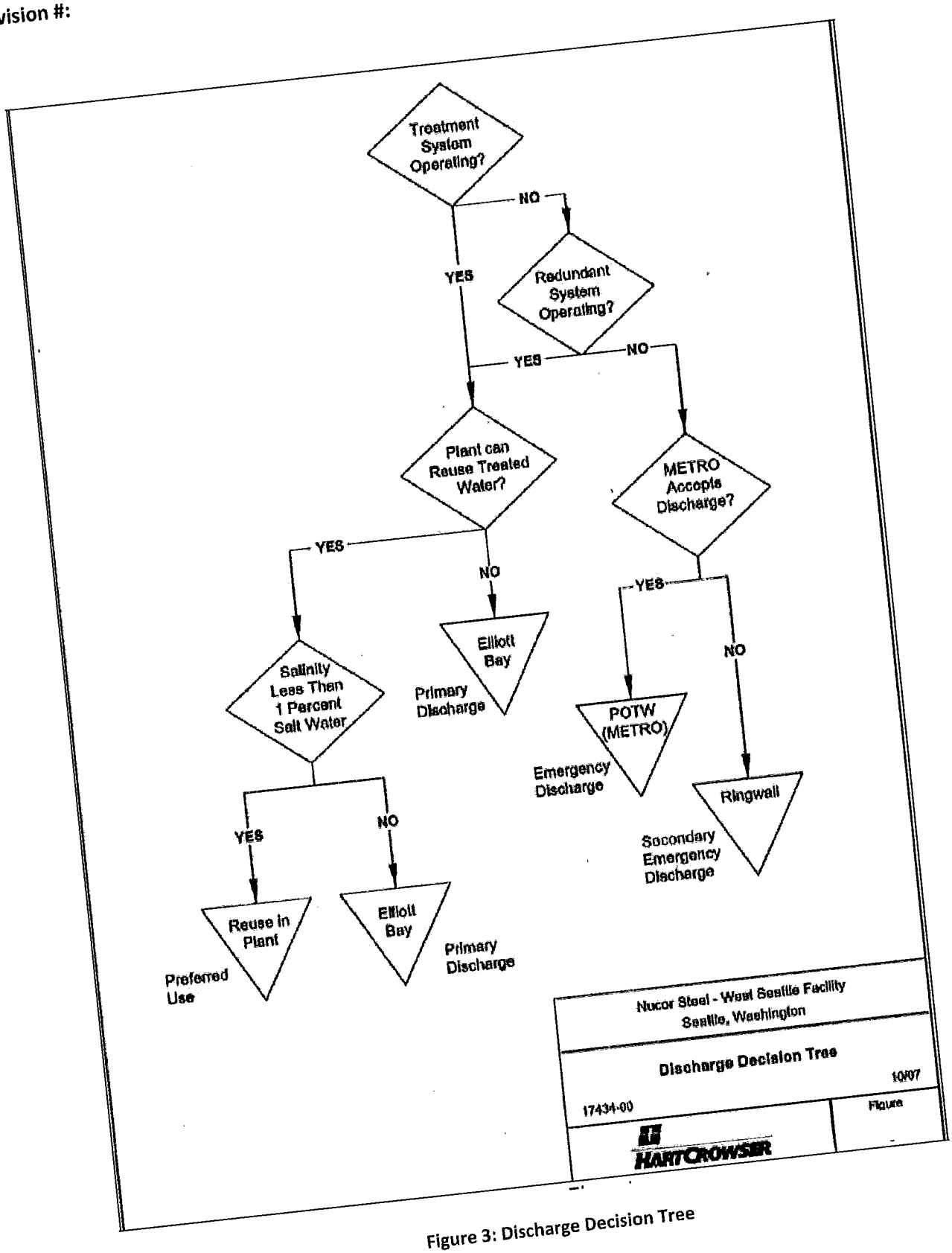


Figure 3: Discharge Decision Tree

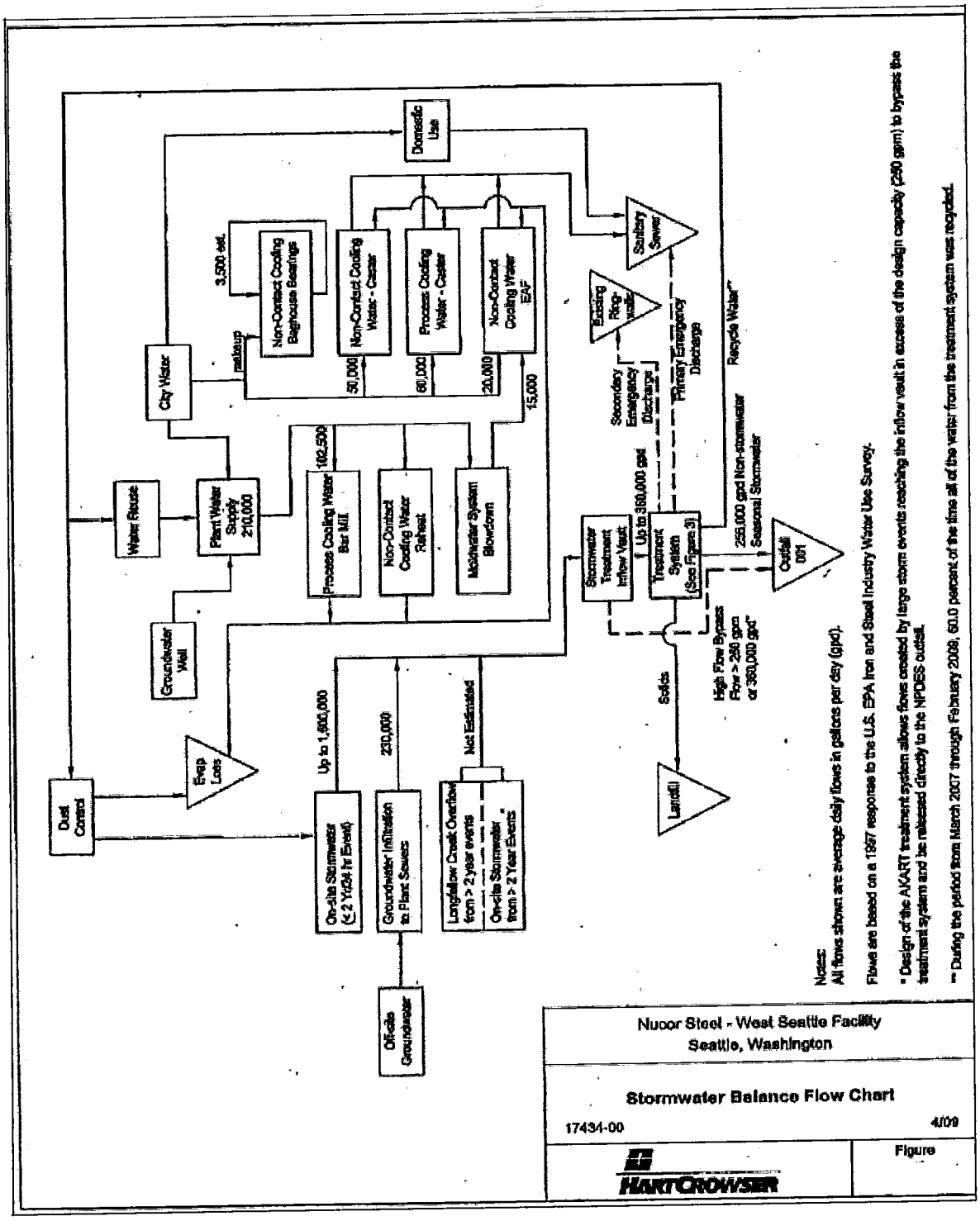


Figure 4: Storm Water Balance

Revision #:

Revision Date:

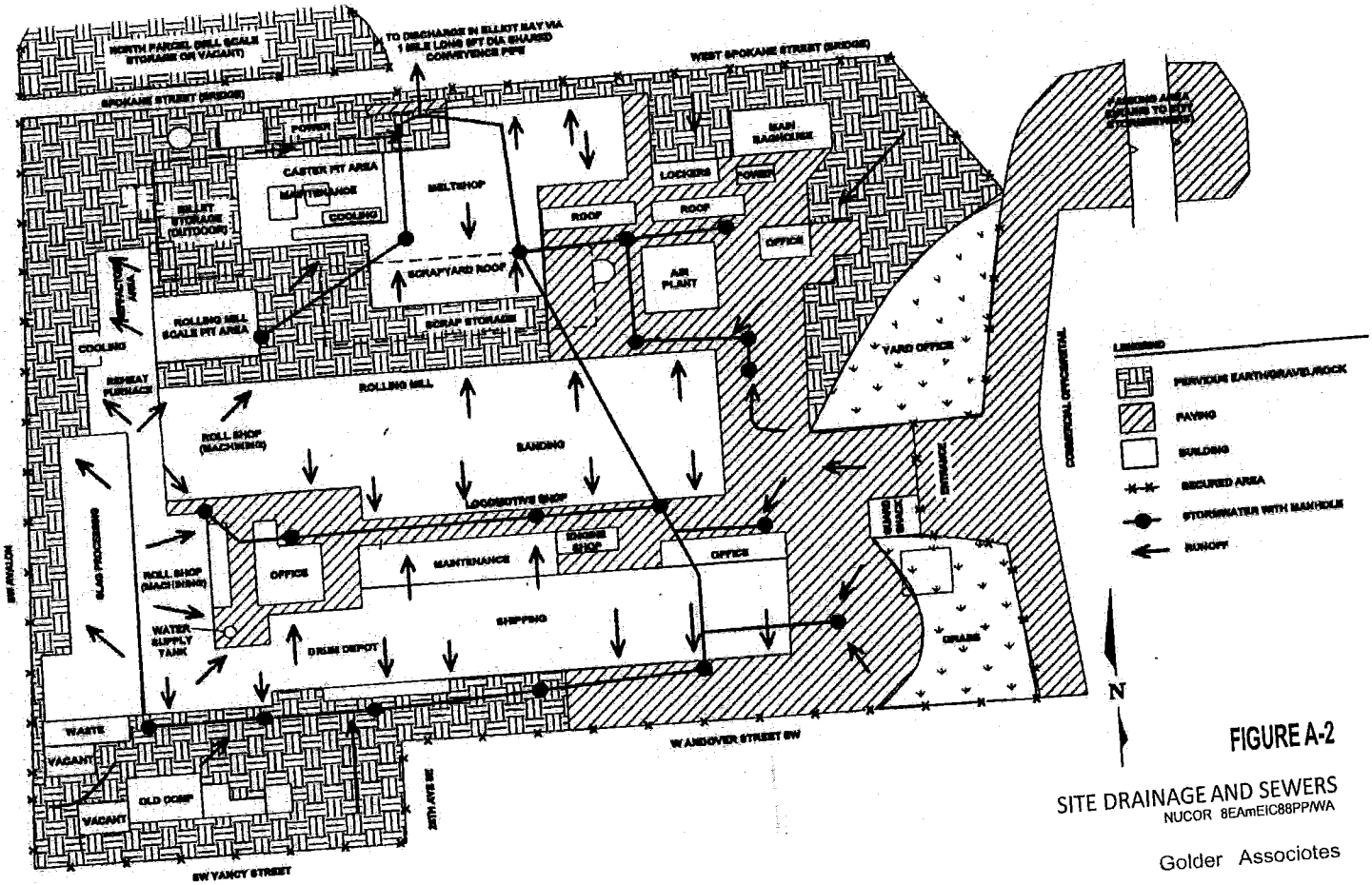


FIGURE A-2

SITE DRAINAGE AND SEWERS

NUCOR 8EAmEIC88PP/WA

Golder Associates

Figure 5: Site Drainage

Printed By:

Print Date:

Document Status:

Document Type: Not Valid

Revision Date:

Revision #:

Printed By:
Print Date:

Document Status:
Document Type: Not Valid

ATTACHMENT 1 – NPDES PERMIT NUMBER WA0031305

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM
WASTE DISCHARGE PERMIT No. WA0031305

State of Washington
DEPARTMENT OF ECOLOGY
Northwest Regional Office
3190 160th Avenue SE
Bellevue, WA 98008-5452

In compliance with the provisions of
The State of Washington Water Pollution Control Law
Chapter 90.48 Revised Code of Washington
and
The Federal Water Pollution Control Act
(The Clean Water Act)
Title 33 United States Code, Section 1342 et seq.

Nucor Steel Seattle, Inc.
2424 SW Andover Street
Seattle, WA 98106

is authorized to discharge in accordance with the Special and General Conditions that follow.

Facility Location:
2424 SW Andover Street
Seattle, WA 98106
King County

Industry Type:
Steel Manufacturing

Standard Industrial Classification (SIC):
3312-Steel Production – EAF Minimill

Receiving Water:
Elliott Bay

Discharge Location:
Outfall 001:
Latitude: 47.597222° N
Longitude: 122.366667° W

Kevin C. Fitzpatrick
Water Quality Section Manager
Northwest Regional Office
Washington State Department of Ecology

Revision Date:

Revision #:

ATTACHMENT 2 – EQUIPMENT AND MATERIALS INVENTORY

Revision #: **Revision Date:**

Equipment/Material Description	Manufacturer/Vendor/Contact	Quantity/Volume
NALCLEAR 7744 Anionic Flocculent	NALCO 5210 Northwest Fruit Valley Road Vancouver, WA 98660 (360) 750-6512	2 x 55- gallon drums (one drum is redundant)
ULTRION 8187 Coagulant	NALCO 5210 Northwest Fruit Valley Road Vancouver, WA 98660 (360) 750-6512	2 x 250- gallon totes (one tote is redundant)
Sedimentation Tanks	Field Fabricated	3 x 20,000 gallon tanks (triple redundancy)
Sand Filter, GAC Filter and Piping	Clear Water Services 2525 West Casino Road Suite 7A Everett, WA 98204 (425) 412-5700	4 x 2 sets of sand filters 1 triplex 5,000 GAC filter assembly Schedule 80 piping
Conductivity Meter GF Signet 2839	Ryan Herco Flow Solutions 22405 72nd Avenue South Kent, WA 98032 (253) 395-1141	1 Meter
Turbidimeter HF Microtol	Ryan Herco Flow Solutions 22405 72nd Avenue South Kent, WA 98032 (253) 395-1141	2 Meters
Flow Meter, pH meter and Battery-powered transmitters GF 9900	Ryan Herco Flow Solutions 22405 72nd Avenue South Kent, WA 98032 (253) 395-1141	1 Flow Meter 1 pH Meter 2 Transmitters
Duplex Strainer DB Series	Ryan Herco Flow Solutions 22405 72nd Avenue South Kent, WA 98032 (253) 395-1141	2 duplex strainers
4" Valve actuators	Bettis/FNW Valve Company (503) 287-8383	2 Valves with Actuators (one is redundant)
Olympian Generator Backup Generator	Caterpillar/NC Machinerey 17035 W VALLEY HWY TUKWILA WASHINGTON, 98188-5519	1 Generator
Backup Air Compressor 200 psi at 450F	Ingersoll Rand	1 Air Compressor

Revision #: **Revision Date:**

6" Rubber Hoses	Grainger 4930 3RD Ave. S., Seattle, WA 98134 (206) 767-4500	2 x 25 ft Sections
4" Rubber Hose	Grainger 4930 3RD Ave. S., Seattle, WA 98134 (206) 767-4500	1 x 25 ft Section
CO2 Tanks	PraxAir (206) 264-2881	1 tank
Dosing Pumps	Liquid Pro	2 Pumps
Filter Pumps	Baldor Motor/Cascade Machinery 4600 East Marginal Way South Seattle, WA 98134 206-762-0500	2 Pumps
Pit Pumps	Baldor Motor/Cascade Machinery 4600 East Marginal Way South Seattle, WA 98134 206-762-0500	2 Pumps
2" Valve Actuators	Ferguson Waterworks 2042 112th St S Tacoma, WA 98444 (253) 538-8275	20 Valve Actuators
Water Level Controller	Ferguson Waterworks 2042 112th St S Tacoma, WA 98444 (253) 538-8275	2 Controllers
Flow Meter	Krohne (866) 859-2940	1 Flow Meter
Activated Carbon	Siemens (Formerly U.S. Filter) 601 S Snoqualmie Street Seattle, WA 98108 (206) 329-3090	14,000 – 19,000 lbs on-site

ATTACHMENT 3 – KING COUNTY DISCHARGE AUTHORIZATION NO. 4012-04

Revision Date:

Revision #:

King County
Wastewater Treatment Division
Industrial Waste Program
Department of Natural Resources and Parks
201 South Jackson Street, Suite 513
Seattle, WA 98104-3855
206-477-5300 Fax 206-263-3001
TTY Relay: 711

August 16, 2016

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Pat Jablonski
Nucor Steel Seattle, Inc.
2424 SW Andover St.
Seattle, WA 98106

Issuance of Wastewater Discharge Authorization No. 4012-04 to Nucor Steel Seattle, Inc.

Dear Mr. Jablonski:

The King County Industrial Waste Program (KCIW) has reviewed your application to discharge industrial wastewater to the sewer system from the Nucor Steel Seattle, Inc. facility located at 2424 SW Andover Street, Seattle, Washington, and has issued the enclosed Major Discharge Authorization. The enclosed Discharge Authorization No. 4012-04 supersedes and cancels Discharge Authorization No. 4012-03 effective September 13, 2013.

The main changes to this authorization are:

- Removed the requirement to notify King County 48 hours prior to discharge;
- Removed the requirement to submit sample results for approval prior to discharge;
- Removed the requirement to analyze for PCB Aroclor 1262;
- Added new definition of composite sample; and
- Added a discharge restriction for when there is measurable rainfall within the previous 24-hour period.

This authorization permits you to discharge limited amounts of industrial wastewater into King County's sewer system in accordance with the effluent limitations and other requirements and conditions set forth in the document and the regulations outlined in King County Code 28.84.060 (enclosed). As long as you maintain compliance with regulations and do not change the nature and volume of your discharge, KCIW will not require you to apply for an industrial wastewater discharge permit, a type of approval that would result in additional requirements and increased fees.

ATTACHMENT 4 – WATER TREATMENT PLAN CHECKLIST

All inspection forms maintained separately in document management system.

ATTACHMENT 5 – WATER TREATMENT PLAN OBSERVED WEIR OVERFLOW OCCURRENCE NOTICE

Form maintained in document management system as DOC-0027-ENV.

Revision Date:

Revision #:

ATTACHMENT 6 – WATER TREATMENT CHEMICAL SDS

All SDSs are maintained in MSDS Online.

Revision Date:

Revision #:

Printed By:
Print Date:

Document Status:
Document Type: Not Valid

OPERATING INSTRUCTION MANUAL

Model P53
pH/ORP Analyzer

(Universal-mount 1/2 DIN style;
selectable for pH or ORP measurement)

Worldwide Headquarters and Sales:

GLI International, Inc.
9020 West Dean Road
Milwaukee, Wisconsin 53224
U.S.A.

Phone: [414] 355-3601
Fax: [414] 355-8346
E-mail: info@gliint.com
Web: www.gliint.com

Represented By:

In the interest of improving and updating its equipment, GLI reserves the right to alter specifications to equipment at any time.

Revision Date:

Revision #:

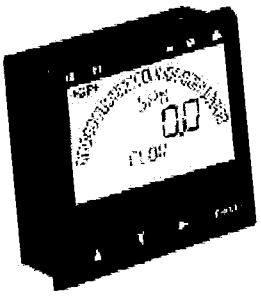
ATTACHMENT 8 – GF 9900 MANUAL

+GF+

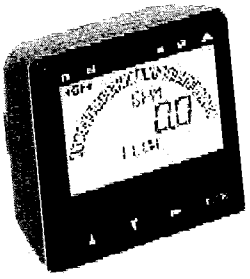
Signet 9900 Transmitter

3-9900.090 Rev. G 02/17

Operating Instructions



Panel Mount



Field Mount

- English
- Deutsch
- Français
- Español
- Italiano
- 中文

Quick Start

Look for the Quick Start icon to quickly set up your new 9900.

Your new Signet 9900 Transmitter needs to be calibrated and the sensor needs to be initialized prior to use. The following steps outline the recommended procedure to start up a new system.

Description

The 9900 Transmitter, a member of Signet's line of SmartPro® instruments, provides a single-channel interface for all Flow, pH/ORP, Conductivity/Resistivity, Salinity, Pressure, Temperature, Level, Dissolved Oxygen, Turbidity, Batch and other applications.

The 9900 is available in either Panel or Field Mount. Both versions run on 10.8 to 35.2 VDC power (24 VDC nominal), and can power certain sensors on loop power (see NOTE on page 11).

The 9900 Transmitter, also allows third-party 4 to 20 mA signals to be used as an input (optional Signet 8058 i-Go® Signal Converter required, sold separately).

Compatibility

The 9900 is compatible with all GF Signet products listed in the column to the right.

- pH and ORP electrodes require the Signet 2750/2751 DryLoc® Sensor Electronics (sold separately).
- Conductivity/Resistivity or Salinity measurement requires either the optional Direct Conductivity/Resistivity Module (part number 3-9900.394) or the Signet 2850 Conductivity/Resistivity Sensor Electronics (sold separately).
  NOTE: If using the 2850, use the one-channel Digital (S^3L) models. The two-channel model 3-2850-63 may be used with only one channel connected. Do not use with both channels connected. The 4 to 20 mA models 3-2850-52 and 3-2850-62 are incompatible with the 9900.
- Turbidity measurement using Signet 4150 or Dissolved Oxygen measurement using Signet 2610-31 requires Signet 8058 i-Go Signal Converter (sold separately).

Flow
515*/B510*, 525*, 2000, 2100, 2507, 2536*/8512*, 2537, 2540*, 2551, 2552

pH/ORP
2724-2726 with 2750*/2751
2734-2736 with 2750*/2751
2758-WTx–2757-WTx with 3719 and 2750*/2751
2764-2767 with 2750*/2751
2774-2777 with 2750*/2751

Conductivity/Resistivity, Salinity
2819-2823 with 2850 or Cond/Res Module
2839-2842 with 2850 or Cond/Res Module

Level, Temperature, Pressure
2250*, 2350*, 2450*

Turbidity
4150 requires 8058

Dissolved Oxygen
2610-41 direct to 9900
2610-31 requires 8058

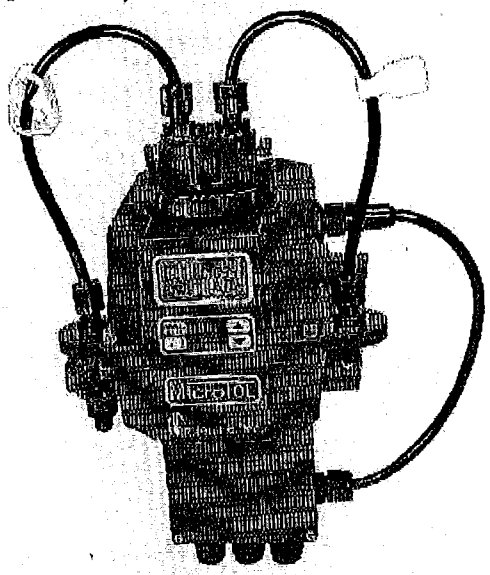
* Can be run on Loop Power (see NOTE on page 11)

ATTACHMENT 9 – MICROTOL TURBIDIMETER MANUAL

Revision #:

Revision Date:

HF scientific, inc.



OWNER'S MANUAL

MicroTOL Series Turbidimeter

HF scientific, inc.
3170 Metro Parkway
Ft. Myers, FL 33916
Phone: 239-337-2116
Fax: 239-332-7643
E-Mail: info@hfscientific.com
Website: www.hfscientific.com

Catalog No. 24034 (6/05)
Rev. 3.4

Document Status:
Document Type: Not Valid

Printed By:
Print Date:

ATTACHMENT 10 – MAXIM FILTER BACKWASH CONTROL BOX

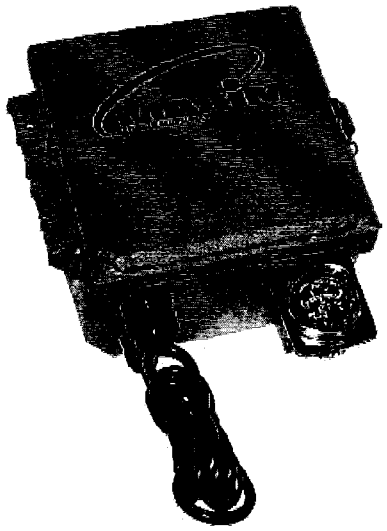
Revision #: **Revision Date:**

MAXIM
A PRODUCT OF MILLER-LEAMAN, INC

State-of-the-art filter backflush controller

OWNER'S MANUAL

FOR THE TURBODISC PRODUCT LINE



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Print Date:

Revision #: **Revision Date:**

ATTACHMENT 11 – NEXTSAND STARTUP MANUAL

next™ filtration technologies inc. **System Start-Up & Operation Guidelines**

next Sand

Start-Up Instructions

Water-only backwash

1. Check that the correct backwash (BW) flowrate has been determined based on the water temperature. (See table below)
2. Allow the tank to slowly fill with water from the bottom. This is most easily accomplished by setting the control valve to the backwash position and partially opening the inlet valve until water flows from the drain line.
3. Allow the next-Sand to soak for at least 30 minutes.
4. Fully open the inlet valve and set the control valve in the backwash position.
5. Depending on how critical the application is, allow the filter to backwash for 20 to 30 minutes. Continue the backwash until the water is clear and free of particles. This is backwash #1.
6. Allow the filter to settle for 10 to 15 minutes. Do not allow the control valve to enter the fast rinse cycle.
7. Depending on how critical the application is, allow the filter to backwash again for 15 to 20 minutes. This is backwash #2.
8. Allow the filter to fast rinse (downflow) for 5 to 8 minutes.
9. The filter is now ready for service.

Operation Guidelines

Operation Guidelines-Valve Programming

Backwash Frequency	Based on Delta P
Backwash Duration	10 Minutes
Settling	2+ Minutes
Rinse	3 Minutes

Backwash Rate

Tank Dia.	8"	10"	12"	14"	16"	Reference
gpm@80F	8	12	18	24	31	23 gpm/ft²
gpm@70F	7	11	16	21	28	20 gpm/ft²
gpm@60F	6	9	13	18	24	17 gpm/ft²
gpm@50F	5	8	12	16	21	15 gpm/ft²
gpm@40F	4	7	10	13	17	13 gpm/ft²

Revised 1-18-05

Revision #: **Revision Date:**

ATTACHMENT 12 – BAG FILTER MANUAL

INSTALLATION, OPERATION AND MAINTENANCE MANUAL

ROSEDALE PRODUCTS, INC.

MODEL 82

150 PSIG RATED FILTER UNIT

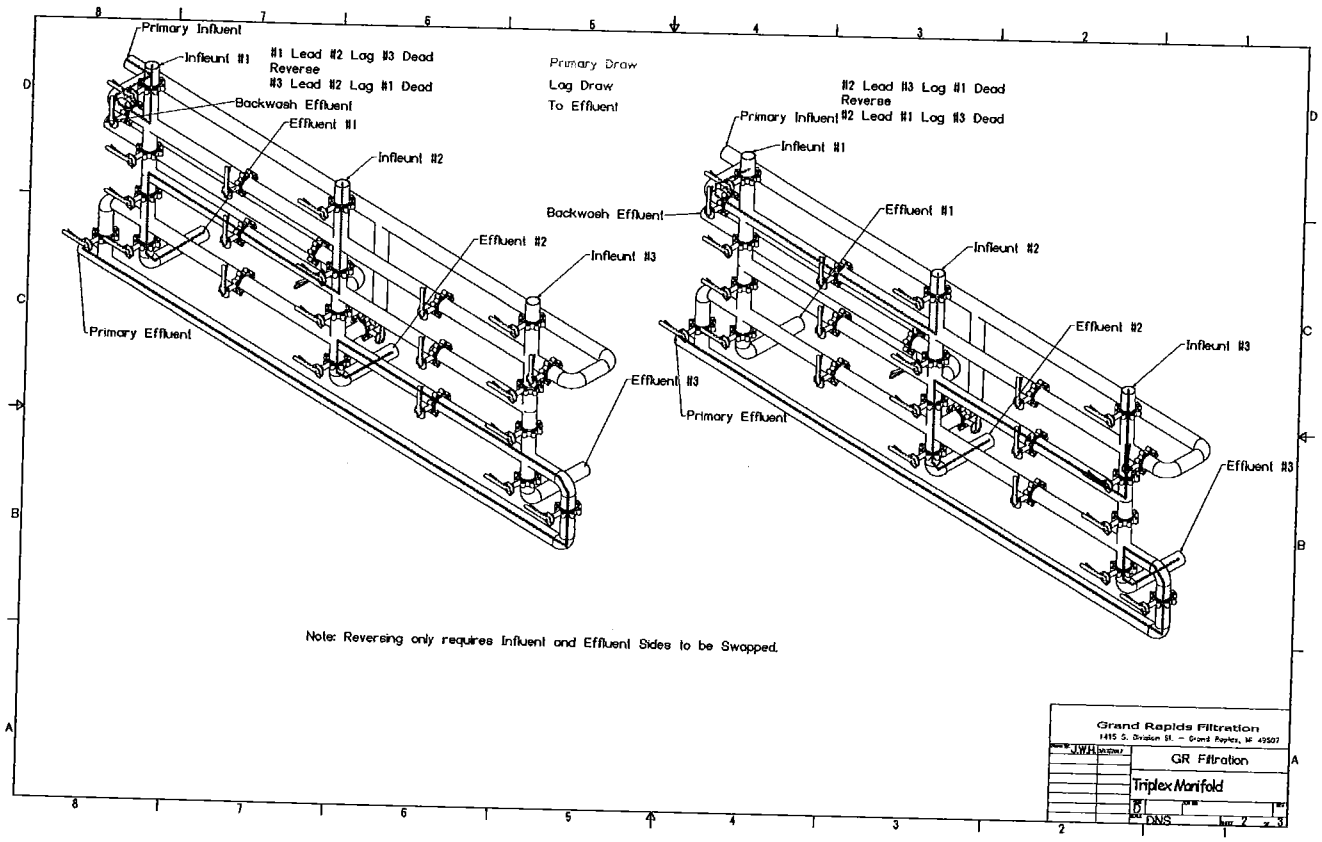
Table of Contents

Rosedale Engineering Standards are the property of Rosedale Products, Inc. A Rosedale standard or copy thereof shall not be distributed (except with express approval of Rosedale Products, Inc.) to any individual or firm beyond the intended recipient (firm or individual). Firms or individuals acting contrary to the above may be subject to suit, ineligibility for continued or future employment, or removal from Rosedale's "Approved Manufacturers and Rosedale Contractors List".

ATTACHMENT 13 – TRIPLEX GAC FILTER FLOW DIAGRAM

Revision #:

Revision Date:



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