NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT
Fact Sheet/Permit Evaluation Report

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Permittee: Evraz Oregon Steel Portland Steel Works P.O. Box 2760 Portland, OR 97208-0363	**Plant Location:** 14400 N. Rivergate Blvd. Portland, OR 97208
Sources Covered: Process Wastewater, Contact Cooling Water, Non-contact Cooling Water, Incidental Storm Water, and Ground Water Seepage/Dewatering	**Receiving Stream:** Willamette River
Source Category: Minor Industrial	**Proposed Action:** Issuance of renewal permit
File Information: WQ-Multnomah County File No. 64905 EPA Reference No.: OR 000045-1	**Source Contact:** Drew Gilpin Environmental Manager 503-978-6189
Preparer: Rob Burkhart 503-229-5566 Northwest Region – Water Quality	**Date Prepared:** 11/23/2009

1.0 Description of Proposed Action

A National Pollutant Discharge Elimination System (NPDES) permit was issued by the Department of Environmental Quality (Department) to Evraz Oregon Steel (EOS) – Portland Steel Works on April 10, 2003 (2003 NPDES Permit). The permit was modified on June 23, 2004 to reflect changes being made at the facility to reduce the wastewater flow rate and to promote better mixing and dilution (2004 NPDES permit). The permit expired on March 31, 2008. Since a timely renewal application was submitted to the Department (received on October 2, 2007), the permit has been administratively extended. EOS has continued to operate under the terms and conditions of the 2004 NPDES permit pending Department action on the renewal application. The Department is now proposing to renew the NPDES permit for the EOS Portland Steel Works facility.

The Federal Water Pollution Control Act of 1972 and subsequent amendments require an NPDES for the discharge of wastewater to surface waters. Furthermore, Oregon Revised Statutes (ORS 468B.050) also require a permit for the discharge of wastewater to surface waters. This proposed permit action by the Department fulfills both federal and state requirements.

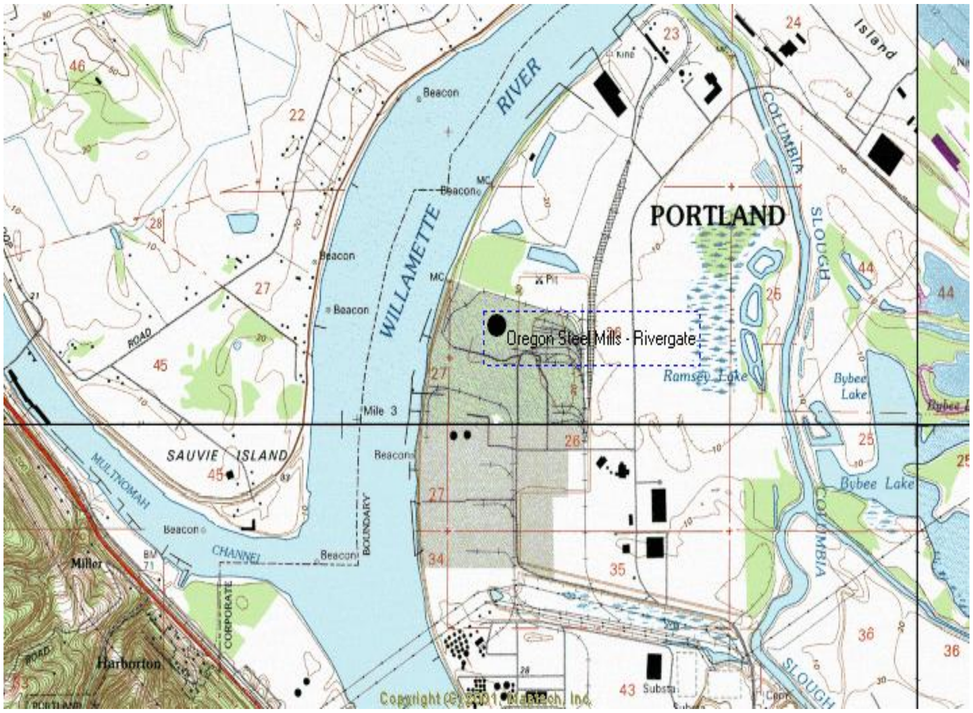
The primary changes proposed in the draft permit over the existing permit are related to the toxic monitoring requirements. The new permit includes significantly more toxic monitoring. All priority metals, cyanide and phenols are to be monitored at least twice per year (see Schedule B of draft permit). All other priority toxic pollutants are to be monitored at once per year (see Schedule B of draft permit). In addition, the testing requirements in Schedule D have been updated to reflect current standard DEQ language for whole effluent toxicity (WET) testing requirements.

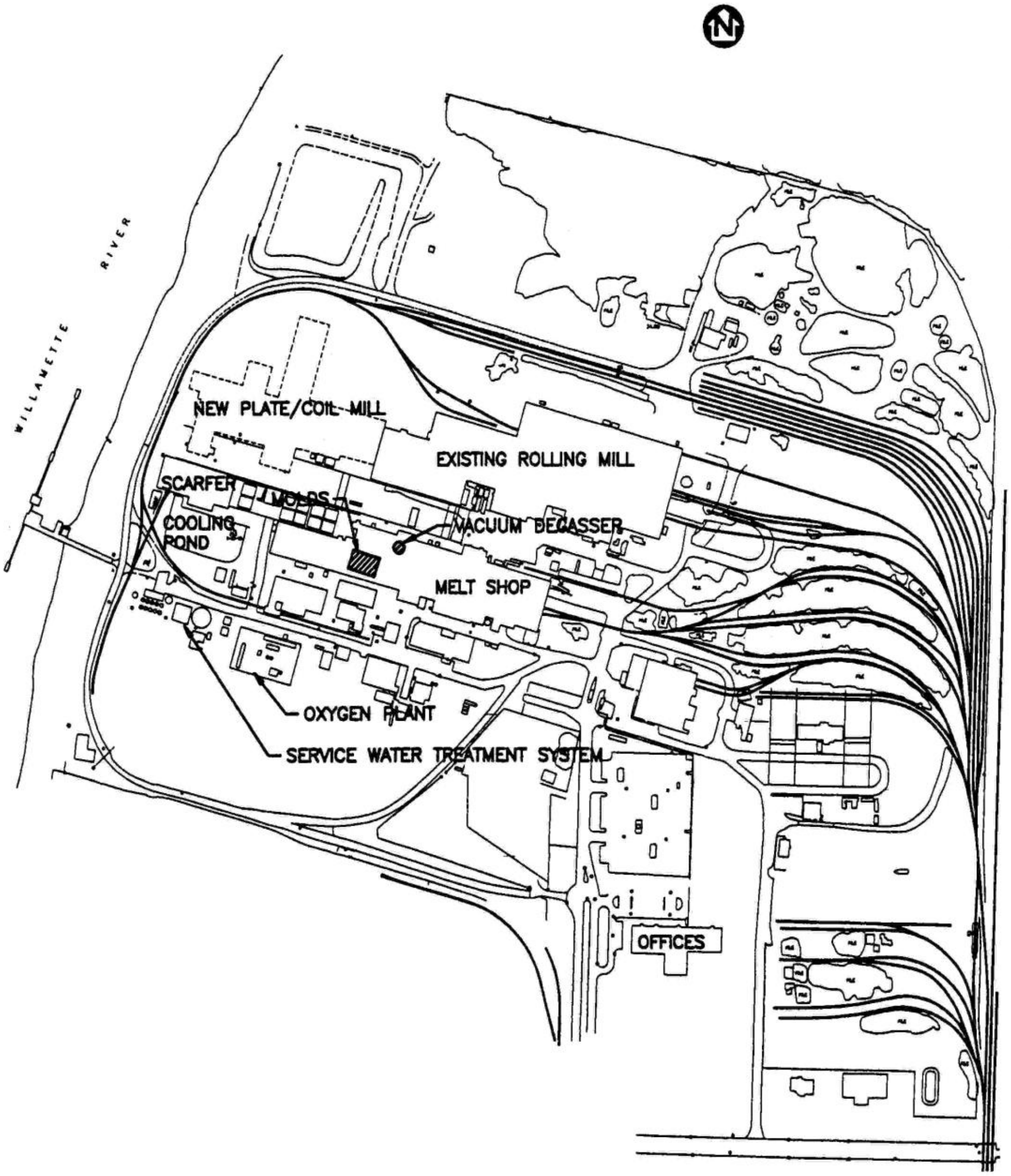
2.0 Facility Description

2.1 General

EOS operates a steel plate and pipe manufacturing plant at 14400 N. Rivergate Boulevard in Portland, Oregon. The plant is adjacent to the Willamette River at about River Mile 2.7. Figure 1 shows that the plant is located downstream of the Multnomah Channel, where a portion of the flow leaves the Willamette to join the Columbia River at St. Helens. Figure 2 shows the locations of plant process areas that produce wastewater. Figure 3 shows an aerial view of the site.

Figure 1


Oregon Steel Mills - Rivergate
PORTLAND
WILLAMETTE
RIVER
COLUMBIA
SLOUGH
SAUVIE ISLAND
MULTNOMAH
CHANNEL
Ramsey Lake
Bybee Lake
Miller
Harborton
Mile 3
BOUNDARY
CORPORATE
Beacon



WILLAMETTE RIVER
NEW PLATE/COIL MILL
EXISTING ROLLING MILL
SCARFER
MOLDS
COOLING POND
VACUUM DEGASSER
MELT SHOP
OXYGEN PLANT
SERVICE WATER TREATMENT SYSTEM
OFFICES

Figure 2

Figure 3

2.2 Manufacturing Process

The EOS facility manufactures carbon steel slabs, coils, and plates from recycled scrap metal, raw metals, and additives. It also manufactures and coats welded spiral steel pipe. Primary facilities at the site include scrap processing, a steel melt shop that includes slab casting and scarfing, plate rolling, plate coiling, surface processing, a spiral pipe mill and a cut-to-length facility. Support facilities include those associated with maintenance, utilities, oxygen supply, wastewater treatment, slab storage, and transport of materials and products.

The following presents brief summaries of the activities associated with primary site processes:

- **Scrap Yard:** On average, approximately 1,000 tons of processed scrap steel may be stored in the scrap yard (60,000 when the melt shop is running). Slab steel product is stored in the slab yard between the melt and rolling mill buildings.

- **Vehicle Maintenance and Ancillary Shop:** Vehicle maintenance is conducted indoors in a maintenance building located in the southeast quadrant of the site. New and waste oils are stored under cover in this area. Waste oil and waste antifreeze are stored in drums prior to offsite transfer and recycling in accordance with state and federal waste regulations. Equipment and trucks are cleaned at the nearby steam cleaning area. The wash water from the steam clean area is collected, treated, and discharged to the City of Portland sanitary sewer.

- **Melt Shop:** The melt shop has been idle since 2003, but may return to operation if market conditions change. When the shop is in operation, scrap metal is melted as the initial step in the steelmaking process. Approximately 80–85 percent of the scrap steel arrives at the facility already processed (i.e., cut into manageable pieces). The remaining 15–20 percent requires torch processing. The scrap metal, carbon, and flux are added to the electric arc furnace (EAF) and melted. Oxygen is injected to make the melting process more efficient and to reduce carbon monoxide emissions. Slag is poured off, processed onsite, and sold. The molten metal is then transferred to the ladle metallurgy furnace (LMF) for refining. If there is no need to degas the steel, it moves directly from the LMF to the casting area. If required by the customer specification, the molten metal is moved from the LMF to the vacuum degasser where gaseous impurities are removed. Emissions produced from the melting and refining process are captured and contained in a baghouse. The refined steel is then delivered to the casting area where air pressure is used to inject the molten steel into graphite-lined molds sprayed with mullite (kaolinite clay, a release agent). Cooling water is flushed through the carbon blocks, and then the slab is removed from the mold and placed in cooling boxes to control the cooling rate of the slab.

  The melt shop consists of an electric arc furnace, a ladle metallurgy furnace, and the molds. Scrap metal is melted in the electric arc furnace and transported to the ladle metallurgy furnace in ladles. Depending on customer requirements, the melted scrap is refined and may pass through the vacuum degasser where dissolved gasses, mostly hydrogen, are removed.

- **Vacuum Degasser:** The vacuum degasser is a sealed vessel that uses water flowing through a Venturi to create a vacuum for removal of gas dissolved in the molten metal. The degasser cover is cooled by water flow through tubes in the cover. This process is used only when called for in product specifications.

- **Slab Scarfing Facility:** The steel travels to the slab scarfing facility where oxidized steel and residual mullite are removed through both machine and hand scarfing. Used mullite is transported offsite for recycling or disposal. Emissions from the machine scarfing process are captured and contained in a baghouse. Steel dust from the baghouse is recycled. The resulting master slab is then moved to the slab yard between the melt shop and the rolling mill.

  The scarfing torch is an oxygen-fueled torch used to remove oxidized iron from the slabs. To prevent the torch nozzle from melting, it is cooled by a once-through pass of city water. Solid material removed from the slabs falls into a scale pit beneath the scarfing operation.

- **Plate Rolling Mill and Combination Mill Building:** If necessary, scarfed master slabs are cut using gas torches and the pieces are transferred to the rolling mill where they are reheated in a furnace and rolled into steel plate or coil. Plates are then sheared or torch-cut to the proper width and length requirements. Excess plate is returned to the scrap processing department to be recycled.

- **Spiral Pipe Mill**: In 2006, a new spiral pipe mill and associated coating operation were added at the site. The spiral pipe mill further processes the coil steel produced on-site into a spiral welded steel pipe. After hydrostatic and ultrasonic testing, the welded pipe may be internally and externally finish coated (not all of the pipe that is manufactured is coated).

- **Cut-to-Length Facility:** Finished steel coil requiring cutting is transported to the cut-to-length facility. The coil is cold cut (sheared) to specified lengths. Excess coil is returned to the scrap processing department to be recycled.

- **Shipping Bay:** Steel plates may be stored, sent directly to the customer, or, for approximately 20 percent of the products, shipped to the heat-treating facility and/or sent to the surface processing site for further surface preparation. Finished steel plates are loaded onto railcars or trucks for shipment offsite to the customer.

- **Surface Processing:** At surface processing, steel plate is cleaned of surface imperfections (by abrasive blasting) and may or may not be coated depending on customer specifications. Spent steel shot from the abrasive blasting process is collected and recycled with scrap steel. Particulate is collected in a baghouse and recycled.

- **Water Treatment Facility (including the associated cooling pond):** Water is treated and discharged directly to the Willamette River under a National Pollutant Discharge Elimination System (NPDES) waste discharge permit.

- **Baghouses:** The baghouses collect exhaust fumes produced within the melt shop (graphite, scarfing, and furnaces) and surface processing facility (abrasive blasting). The EAF dust is shipped offsite to a permitted landfill. Graphite, scarfing dust and spent steel shot are recycled.

- **Utility Area (oxygen supply):** The oxygen plant has been replaced by oxygen tanks and supplys pure oxygen for use by the EAF, scarfing torch, and throughout the plant. Other buildings in this area include the electrical and process automation shops, a compressor room, and other ancillary buildings.

- **Dock:** It is believed that the dock has not been used for any over-water activities since the 1980s. The dock is currently used as infrastructure for river water intake and effluent systems.

Figure 4 is a production flow diagram beginning with the electric arc furnace in the melt shop and ending with plate or coil steel ready for market or further processing.

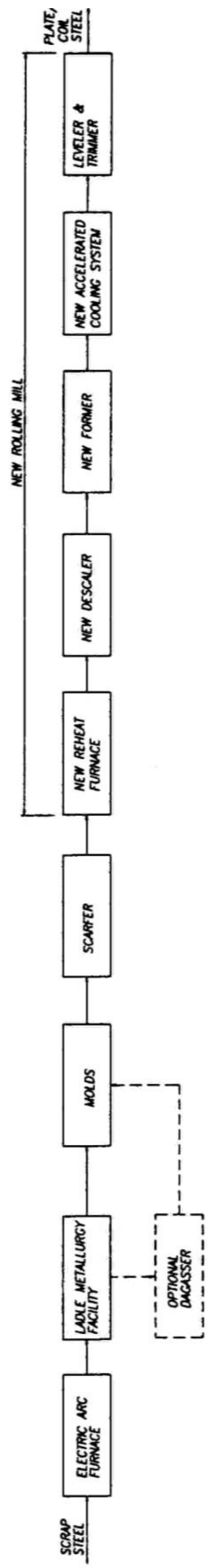

SCRAP STEEL
ELECTRIC ARC FURNACE
LADLE METALLURGY FACILITY
OPTIONAL DAGASSER
MOLDS
SCARFER
NEW REHEAT FURNACE
NEW DESCALER
NEW FORMER
NEW ACCELERATED COOLING SYSTEM
LEVELER & TRIMMER
NEW ROLLING MILL
PLATE, COIL STEEL

Figure 4

3.0 Water Supply and Wastewater Generation

3.1 System Description

The water/wastewater system at the EOS site is primarily comprised of a recirculating service water system with a treatment system and subsequent discharge of treated wastewater to Outfall 001. More than 75,700 m^3/d (20 mgd) of water is circulated within the plant for cooling furnaces, quenching steel and other processes. More than 90 percent of this flow comes from cold wells under the cooling towers and from water returned from the cooling pond and sand filter treatment system. Makeup water (water supply) is added from the City of Portland public water distribution system and/or from the Willamette River.

Service water is the term use to describe treated plant water returned for contact cooling water systems and other industrial uses within the plant. Figure 5 shows a schematic of the water flow at the facility.

The service water treatment system consists of the large cooling pond, a bank of sand filters, and a storage tank. The storage tank, identified on Figure 5 as the head tank, is the source of service water for the plant and a source of the discharge to the river through Outfall 001.

Figure 5 may also be used to follow the flow of service water as it is pumped from the cooling pond through sand filters, reused at different locations in the plant, and returned to the cooling pond. From the cooling pond, it is again pumped through the filters for another cycle through the plant

Sanitary Sewer Discharges

Various onsite wastewaters are discharged to the City of Portland sanitary sewer system: sanitary waste, diluted laboratory wash water, treated steam cleaning water, cleaning solutions from the pipe coating operations and oil/water separator effluent.

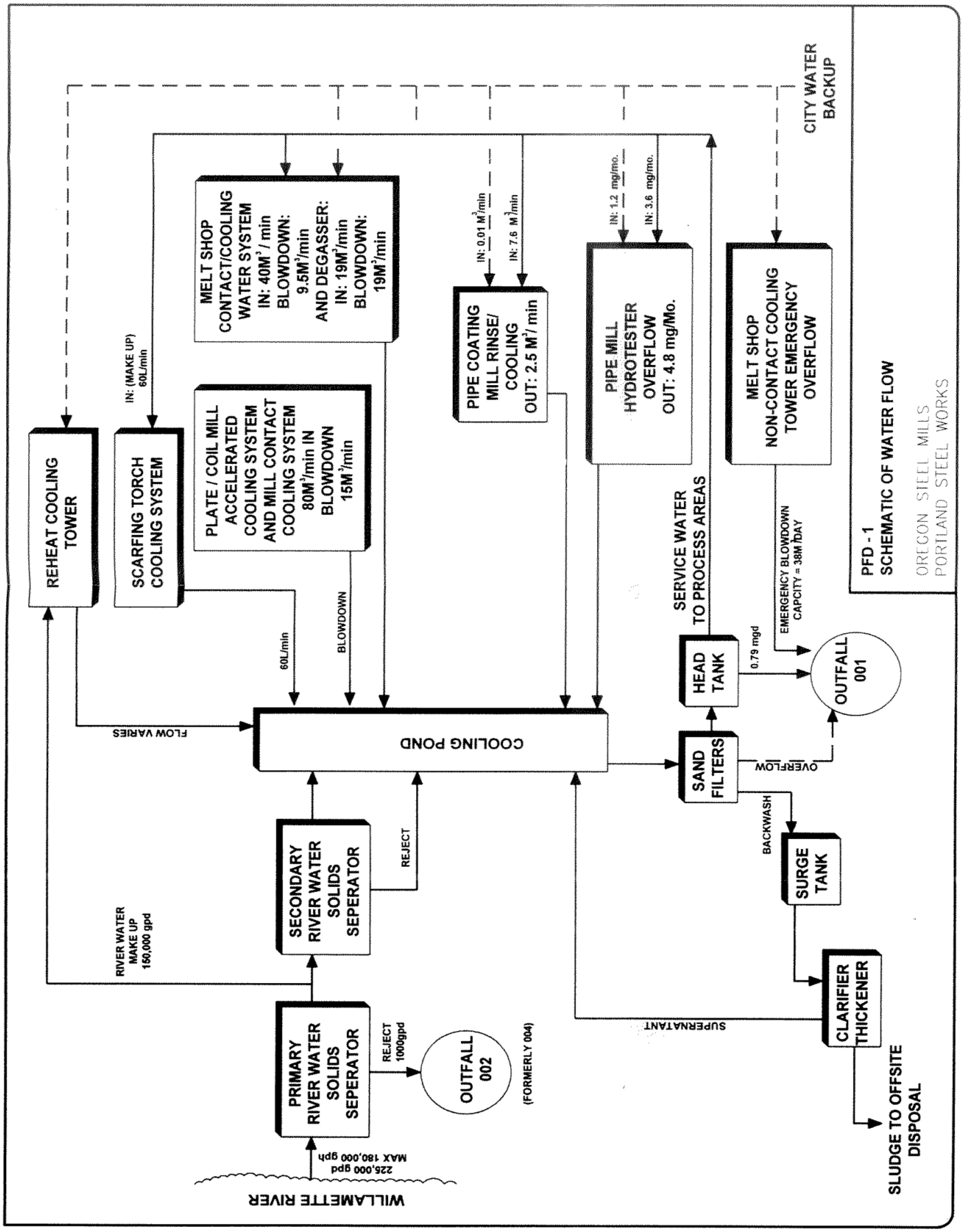
3.2 Site Water Supply

River Water

Willamette River water is pumped through inline solids separators to remove sand, dirt and other small particles. The first of these units, located on the dock, were installed to separate larger solids from the raw river water. Since the addition of an intake screen and the relocation of the water intake to a location nearer to the river surface, this unit appears to have minimal functionality and primarily returns some water, at a rate of about 3 gpm during periodic flushing, back to the river at Outfall 002 (formerly Outfall 004). Rejects from a second unit are discharged to the cooling pond (Figure 5).

City Water

City water is used as makeup water in furnace cooling towers, as an emergency supply to replace river water and service water if either or both of those supply systems fail, and as direct once through cooling for the furnaces should the cooling tower pump system fail.



WILLAMETTE RIVER
225,000 gpd
MAX 180,000 gph
PRIMARY RIVER WATER SOLIDS SEPERATOR
REJECT 1000gpd
OUTFALL 002
(FORMERLY 004)
RIVER WATER MAKE UP 150,000 gpd
SECONDARY RIVER WATER SOLIDS SEPERATOR
REJECT
REHEAT COOLING TOWER
FLOW VARIES
SCARFING TORCH COOLING SYSTEM
IN: (MAKE UP) 60L/min
60L/min
PLATE / COIL MILL ACCELERATED COOLING SYSTEM AND MILL CONTACT COOLING SYSTEM 80M³/min IN BLOWDOWN 15M³/min
BLOWDOWN
MELT SHOP CONTACT/COOLING WATER SYSTEM IN: 40M³ / min BLOWDOWN: 9.5M³/min AND DEGASSER: IN: 19M³/min BLOWDOWN: 19M³/min
COOLING POND
PIPE COATING MILL RINSE/ COOLING OUT: 2.5 M³/ min
IN: 0.01 M³/min
IN: 7.6 M³/min
PIPE MILL HYDROTESTER OVERFLOW OUT: 4.8 mg/Mo.
IN: 1.2 mg/mo.
IN: 3.6 mg/mo.
SAND FILTERS
OVERFLOW
BACKWASH
SURGE TANK
CLARIFIER THICKENER
SUPERNATANT
SLUDGE TO OFFSITE DISPOSAL
HEAD TANK
0.79 mgd
SERVICE WATER TO PROCESS AREAS
OUTFALL 001
MELT SHOP NON-CONTACT COOLING TOWER EMERGENCY OVERFLOW
EMERGENCY BLOWDOWN CAPCITY = 38M/DAY
CITY WATER BACKUP
PFD - 1
SCHEMATIC OF WATER FLOW
OREGON STEEL MILLS
PORTLAND STEEL WORKS

Figure 5

3.3 Wastewater Generation

Wastewater discharged at Outfall 001 is generated from two broad categories: Contact water systems and non-contact cooling water systems. The specific sources of wastewater contained within the two categories are discussed in detail below. In addition to these sources, incidental storm water, groundwater seepage and groundwater from construction dewatering activities are discharged at Outfall 001 after treatment. (Discharges from Outfall 002 are described in section 3.2, above.)

3.3.1 Contact Water Systems

Contact water systems are defined as those systems where cooling or other water comes into contact with any material or surface outside of the piping, pumps and cooling facilities within which it circulates.

The degasser vessel, for example, uses two water systems. One, a non-contact system, is enclosed in the cover and cools the cover without coming into contact with material other than the pipes through which it flows. The second water system flows through a Venturi tube to create the vacuum that pulls dissolved gas from the molten metal. Water in that system is classed as contact water because materials from the product enter the water. Water applied directly to heated steel slabs and steel plates in the rolling mill is also considered to be contact water.

The following are sources of contact wastewater within the facility.

Vacuum Degasser and Molds

When operating, degasser water is collected in a hot well, pumped through a cooling tower, and recycled through the Venturi vacuum system. Cooling tower makeup is supplied by city water and steam from the boiler. Blowdown water from the cooling tower is discharged into the mold sump. Mold cleaning water, water collected in the melt shop basement, and degasser sedimentation supernatant are also discharged to the mold sump and subsequently directed to the cooling pond for treatment at the water treatment facility. Mold cooling water and water used to wash the molds after each slab of steel is cast are the two highest contributors of water and suspended solids to the mold sump.

Water from the mold sump is pumped at a rate of approximately 19 cubic meters per minute to a treatment facility for removal of mullite and other solids. Settleable solids are removed in a plate clarifier. Overflow water from the clarifier is cooled in a cooling tower then is routed to the cooling pond for additional cooling and treatment in the service water sand filters. This facility is located near the service water treatment system. The two facilities share a clarifier thickener and a solids dewatering unit. From the cooling pond, water is pumped through the sand filters to the head tank. From the head tank it is returned to the plant for reuse as contact water.

Plate Cooling and Descaling

Water for cooling and descaling is applied to the heated slab and plate ahead of the roll press. This water flows through two scale pits to the cooling pond. Water used for accelerated cooling is recycled through sand filters and a cooling tower. River water is used for make up in the system and dissolved solids are removed in the sand filter backwash water and in blowdown to the scale pits. Water from the scale pits flows to the cooling pond for treatment at the water treatment facility.

Spiral Pipe Mill and Pipe Coating Mill

The spiral pipe mill, and associated coating operation, came online in 2006. The mill processes the coil steel into a spiral welded steel pipe. Some of this pipe is then coated externally and/or internally. The wastewater generation associated with the pipe production/coating operation is from ultrasonic weld inspection, hydrotesting and pipe cleaning. A total of approximately 11.1 million gallons per month (0.37 MGD or 1400 m^3/d) of wastewater is generated at the spiral pipe mill and coating operation and directed to the water treatment system for reuse.

The ultrasonic process discharges approximately 1.2 million gallons a month to the water treatment system (where it is reused throughout the site). Contaminants from this process are similar in nature to those in the wastewater from the existing plate/coil mill water, but at a lower concentration.

Hydrotesting involves filling a section of pipe with service water and pressurizing for leak detection. The resulting wastewater discharges to the water treatment system up to four times per hour. This process discharges up to 29.5 million gallons per month to the treatment system (where it is reused throughout the site).

Prior to coating, the surface of the spiral steel pipe is washed with a detergent, cleaning agents and water. The spent cleaning water is directed to the city's sanitary sewer system. The pipe is then outer coated using a heated epoxy coating process which is cooled with water. The total wastewater discharged from the cooling operation to the water treatment system is approximately 6.3 million gallons per month.

3.3.2 Non-contact Cooling Water Systems

Non-contact cooling water is defined as water used only for cooling and contacts only the cooling pipes passing through process units and their cooling towers.

Chemicals are used in the cooling towers for the melt shop and the coil/plate rolling mill reheat furnace for pH adjustment to prevent corrosion and scale buildup and for biological growth control. A sodium hydroxide base solution is added for pH control. Biocides and a 12.5% sodium hypochlorite solution are added to control biological growths.

Melt Shop Furnaces and Degasser Cover

When operating, the electric arc furnace, the ladle metallurgy furnace, and the degasser cover in the melt shop river water is used to replace evaporation and blowdown losses. City water is available in the event of an emergency. Blowdown and emergency overflows go to the cooling pond for subsequent treatment before discharge.

Coil/Plate Mill Reheat Furnace

Non-contact cooling water generated at the reheat furnace (water used through internal furnace piping to control furnace temperature) is sent to the reheat cooling towers where some evaporates, and once cool, is then discharged to the cold well. Water from the cold well is then sent to the water treatment system and stored for reuse or discharged.

Spiral Pipe Mill

It is anticipated that a water cooled pressure roller to be utilized as part of the pipe coating operation at the spiral pipe mill will be constructed in the future. The associated non-contact cooling water will be discharged to the cooling pond at a rate of approximately 1500 gallons per month.

4.0 Wastewater Treatment and Discharge

The facility operates two central wastewater treatment systems (melt shop contact water and plant service water treatment systems). The melt shop contact water treatment system discharges to the plant service water treatment system, where it is treated by a bank of sand filters and reused. As water is reused, the dissolved solids level in the water increases. Periodically, EOS discharges a portion of the wastewater from the pond and adds make-up water from the City of Portland public water supply and/or from the Willamette River. Wastewater is discharged to the Willamette River through outfall 001.

In addition to sand filtration, reacting agents are added to the central water treatment systems to modify physical characteristics of the water (i.e., reduce turbidity and biofouling, and promote flocculation). The reacting agents include ferric chloride, ionic polymers, sodium hypochlorite, and antifoaming agents. Sodium hydroxide (caustic soda) and sulfuric acid are also added to control pH.

EOS has changed from high flow rate batch discharges (at a rate of between 2,500 gallons per minute [gpm] to 3,500 gpm) to a lower flow rate discharge of approximately 550 gpm). This significantly lower discharge rate results in increased dilution within EOS's mixing zone and zone of initial dilution (ZID). In addition, EOS modified its outfall structure in 2004 by installing a smaller diameter discharge outfall (8-inch) to further enhance mixing/dilution within the river. The old 30-inch outfall is only to be used in an emergency. The new 8-inch outfall is attached to the dock approximately 70 feet from the eastern bank of the Willamette River. The outfall is about 1 foot above the stream bottom and perpendicular to the river flow.

Outfall 002 (formerly 004) is the discharge from the first unit of the river intake solids separator system. No chemicals are added to the intake treatment system. Since the addition of an intake screen and the relocation of the water intake to a location nearer to the river surface, this unit appears to have minimal functionality and primarily returns some water back to the river. Rejects from the second unit are discharged to the cooling pond.

The proposed NPDES permit does not cover the storm water discharges from the facility. Only incidental storm water that is mixed with the wastewater discharged from outfall 001 is included in this NPDES permit. EOS has a general industrial NPDES permit (#1200-Z) for the discharge of storm water from the facility. The permit requires EOS to prepare and implement a storm water pollution control plan. Under the 1200-Z permit, EOS is also required to periodically sample its storm water discharge to evaluate the effectiveness of the management practices.

5.0 Water Quality Issues

5.1 Applicable Water Quality Standards

The applicable water quality standards are found in Oregon Administrative Rule (OAR) 340-041. They are intended to be protective of the beneficial uses for the basin, which include domestic water supply, industrial water supply, irrigation, livestock watering, fish and aquatic life, salmon and steelhead migration, wildlife and hunting, fishing, boating, water contact recreation, aesthetic quality, and commercial navigation and transportation. Selected water quality standards for the Willamette River are presented in Table 1.

TABLE 1
SELECTED WILLAMETTE RIVER WATER QUALITY CRITERIA

Parameter	In-stream Water Quality Criteria
Dissolved Oxygen (OAR 340-041-0016)	Cool Water Aquatic Life Criteria (applies in summer): $\geq$ 6.5 mg/L (absolute minimum for surface samples)
pH (OARs 340-041-0021 & 340-041-0345)	$\geq$ 6.5 and $\leq$ 8.5
Temperature (OAR 340-041-0028)	The 7-day average maximum temperature of a stream identified as a migration corridor may not exceed 20 ºC (68 ºF) – Insignificant anthropogenic inputs are allowed
Total Dissolved Solids (OARs 340-041-0032 & 340-041-0345)	The concentrations listed below may not be exceeded unless otherwise specifically authorized by DEQ – 100 mg/L
Turbidity (OAR 340-041-0036)	No more than a ten percent cumulative increase in natural stream turbidities shall be allowed, as measured relative to a control point immediately upstream of the turbidity causing activity.

5.2 Water Quality Criteria for Toxic Substances

Tables 20, 30A and 30B of OAR 340-41 specify water quality criteria for toxic substances. The water quality criteria contained in these tables for several metals are based on hardness. For the Willamette River, a hardness of 26 mg/L was used to calculate water quality criteria for hardness dependent metals. Water quality criteria for selected toxic constituents are given below:

TABLE 2 WATER QUALITY CRITERIA FOR TOXIC SUBSTANCES			
Parameter	Unit	Criteria for Protection of Freshwater Aquatic Life	
		Acute	Chronic
Arsenic V	µg/L	850	48
Cadmium	µg/L	[a] 0.86	[a] 0.39
Copper	µg/L	[a] 5.0	[a] 3.7
Lead	µg/L	[a] 14.7	[a] 0.57
Mercury	µg/L	2.4	0.012
Zinc	µg/L	[a] 37.4	[a] 33.8
Nickel	µg/L	[a]454	[a]50
Iron	µg/L	N/A	1000
Chlorine	µg/L	19	11

[a] Hardness dependent criteria. A hardness of 26 mg/L was used for the Willamette River. This is based on water quality data collected by the Portland Bureau of Environmental Services at the St. Johns Railroad Bridge at RM 6.8 (2004-2007).

5.3 303(d) Listing Status

Section 303(d) of the Clean Water Act requires each state to develop a list of water bodies that do not meet state surface water quality standards after implementation of technology-based controls. The state is then required to complete a Total Maximum Daily Load (TMDL) for water bodies on the 303(d) list. The TMDL must address water quality on a basin-wide scale to ensure that overall water quality standards will be met.

OSM discharges wastewater to the portion of the Willamette River that is listed as being water quality limited in the Department's 2004/2006 303(d). Table 3 includes the parameters for which water quality standards in the Willamette River are not met and the season when standards are exceeded:

TABLE 3: 2004/2006 303(D) LISTING INFORMATION		
Stream Segment	**Parameter**	**Season**
Willamette River (Mouth to Willamette Falls)	Aldrin	Year-around
	Bacteria (fecal coliform)	Fall/Winter/Spring
	Biological Criteria	Year-around
	DDT & DDE (DDT metabolite)	Year-around
	Dieldrin	Year-around
	Iron	Year-around
	Manganese	Year-around
	Mercury	Year-around
	Polychlorinated Biphenyls (PCBs)	Year-around
	Pentachlorophenol	Year-around
	Polycyclic Aromatic Hydrocarbons (PAHs)	Year-around
	Temperature	Summer

Of the pollutants contained in the 303(d) list, iron, mercury, manganese and temperature have the potential to be present in the facility's effluent. The discharge is not expected to contribute bacteria, pesticides (DDT, DDE, aldrin, and dieldrin), PCBs, pentachlorophenol, or PAHs at detectable levels. A temperature TMDL for the Willamette River was finalized in September of 2006. A discussion of the temperature issues associated with the discharge is presented in Section 9.1.5. A discussion of the other pollutants of concern is also presented in Section 9.

5.4 Threatened & Endangered Species

Species of anadromous salmonids that use the lower Willamette River near EOS include chinook salmon (*Oncorhynchus tshawytscha*), coho salmon (*O. kisutch*), steelhead trout (*O. mykiss*), and cutthroat trout (*O. clarki*). Resident salmonid game species include cutthroat trout. Bull trout do not occur in this area of the Willamette River.

On March 16, 1999, the National Marine Fisheries Service (NMFS) listed chinook salmon in the Lower Columbia River Evolutionary Significant Unit (ESU) as a threatened species under the Endangered Species Act (ESA). On March 13, 1998, NMFS listed the Lower Columbia River ESU steelhead trout stocks as a threatened species under the ESA. These species utilize the Willamette River and its tributaries. The Willamette River has been designated as critical habitat for listed chinook salmon and steelhead by the NMFS.

Based on the fish use and spawning use maps contained in OAR 340-041 (Figures 340A and 340B), the designated fish use for this segment of the Willamette River is as a salmon and Steelhead migration corridor with no designated spawning uses.

5.5 Mixing Zones

OAR 340-041-0053 provides that the Department may suspend all or part of the water quality standards in a designated portion of the receiving water to serve as a zone of dilution for wastes and receiving waters to mix thoroughly. Water quality standards for all parameters must be met at the edge of the defined mixing zone.

The 2003 NPDES permit defined the mixing zone for Outfall 001 as that portion of the Willamette River within a 90 meter radius from the point of discharge. With the reduction in the effluent flow rate (from 4000 gpm to 550 gpm) and the smaller diameter outfall that was installed under the 2004 permit, the Department made the decision that a smaller mixing zone was feasible and reduced the size of the mixing zone to 100 feet (30.5 meters). This size of mixing zone is considered to be as small as feasible. In October 2001, a mixing zone study of the facility's discharge was conducted by CH2M Hill. A revised mixing zone evaluation was conducted by US Filter (an EOS consultant) in March 2004 for the new outfall pipe with a maximum flow rate of 0.79 mgd (550 gpm). The mixing zone evaluation consisted of using an EPA approved model, CORMIX, to determine dilution at the edge of the proposed mixing zone of 30.5 meters. For the new outfall pipe, the mixing zone study estimated that the dilution factor at the edge of the mixing zone would be approximately 141 during critical low flow conditions (7Q10 flow).

The 2004 NPDES permit also defined the mixing zone for Outfall 002 (formerly 004) as that portion of the Willamette River within a 10 meter radius from the point of discharge.

5.5.1 Zone of Immediate Dilution

A zone of immediate dilution (ZID) within the mixing zone is allowed under OAR 340-041-0053. Compliance with acute toxicity standards must be met at the edge of the ZID. For Outfall 001, the ZID is defined as an area within 10 feet from the point of discharge. Based on the CORMIX modeling in the March 2004 mixing zone evaluation, the dilution factor at the edge of the ZID is 18 during low flow conditions.

EPA guidance was used to size this ZID. The guidance states that the ZID should be the most restrictive of the following criteria:

1) Within 10% of the distance from the edge of the outfall structure to the edge of the regulatory mixing zone. This would result in a ZID of 10 feet (about 3 meters).
2) Within a distance of 50 times the discharge length scale in any spatial direction. The discharge length scale is the square root of the cross-sectional area of the port. This would result in a ZID of 22 feet.
3) Within 5 times the local water depth in any horizontal direction from any discharge outlet. The local water depth is about 10 meters (32.8 feet); this would result in a ZID of 164 feet.

The most stringent of the three criteria is 10% of the distance from the edge of the regulatory mixing zone, which results in a ZID of 10 feet (3 meters).

The 2003 NPDES permit defined the ZID for Outfall 002 (formerly 004) as that portion of the Willamette River within a 1 meter radius from the point of discharge. This was also based on the most stringent of the three criteria noted above (10% of the distance from the edge of the regulatory mixing zone).

5.6 Antidegradation Review

The Department's antidegradation policy in OAR 340-041-0004 requires that a review of discharges to surface waters be conducted to ensure that existing water quality is not lowered unless there are no reasonable alternatives available and the lowering of water quality is necessary for economic and social benefit.

The NPDES permit for EOS's discharge is a permit renewal with no increase in discharge load. Permit renewals with the same discharge load as the previous permit are not considered to lower water quality from existing water quality. Thus, the Department finds that the discharge is not subject to an in-depth antidegradation review. (*Antidegradation Policy Implementation Internal Management Directive for NPDES Permits and Section 401 Water Quality Certifications, ODEQ March 2001*).

6.0 Existing NPDES Permit Limits

The existing NPDES Permit specifies two outfalls: Outfall 001 and Outfall 004 (which is proposed to be renamed 002). The following effluent limits are specified at Outfall 001, which is the process wastewater discharge from the EOSM facility:

TABLE 4
EXISTING NPDES PERMIT LIMITS AT OUTFALL 001

Parameter	Daily Maximum	Monthly Average
Flow	0.79 MGD*	N/A
TSS	1,420 lb/day	532 lb/day
Oil & Grease	15 mg/L	N/A
Turbidity	Must not exceed 25 NTU above stream background levels (to be measured at the river intake)	
TDS	N/A	1136 mg/L
Total Residual Chlorine	0.34 mg/L	0.17 mg/L
Excess Thermal Load (May – October)	30×10^6 Kcal/day (7-day moving average of daily maximum excess thermal load)	
pH	Within the range of 6.0 – 9.0 at all times	

*The permittee is authorized to discharge at a higher flow rate during emergency conditions and during storm events that produce greater than 1.1 inches of rain over a 6-hour period (2year, 6 hour storm event). During these situations, the permittee is authorized to use the existing 24-inch outfall pipe to discharge wastewater from the facility.

In addition to the limitations at Outfall 001, technology-based effluent limits are established at an internal monitoring point for the discharge of contact cooling water/vacuum degasser. The limitations at the internal monitoring point are specified below.

TABLE 5
EXISTING NPDES PERMIT LIMITS AT INTERNAL MONITORING POINT

Parameter	Daily Max	Monthly Ave
Lead	0.23 lb/day (0.106 kg/day)	0.078 lb/day (0.035 kg/day)
Zinc	0.35 lb/day (0.16 kg/day)	0.117 lb/day (0.053 kg/day)

Effluent limits were also established at Outfall 004 (proposed to be renamed Outfall 002 with this permit renewal), the intake water solids separator discharge to the Willamette River. The following table specifies the effluent limits at Outfall 004.

TABLE 6
EXISTING NPDES PERMIT LIMITS AT OUTFALL 004 (to be renamed 002)

Parameter	Limitation	Monthly Ave
Turbidity	No visually discernible plume at a radius of 10 meters from the discharge point	

7.0 Technology-Based Effluent Limitations

Development of effluent limitations for the discharge from the EOS facility involves first determining applicable technology-based limits. EPA has developed technology-based standards called effluent limitation guidelines (ELGs) for many types of industries. The ELGs are typically expressed in terms of mass of a particular pollutant allowed per unit of production or unit of flow. ELGs are also expressed as concentration in which case the production is not relevant. If ELGs are not published for a particular industry, DEQ is required to follow federal guidelines and develop equivalent technology based guidelines.

For existing point source discharges, ELGs have been developed for three categories: Best Practicable Control Technology Currently Available (BPT), Best Conventional Pollutant Control Technology (BCT), and Best Available Technology Economically Achievable (BAT). BPT represents the minimum technology level and applies to all existing point sources discharges for which ELGs have been published. BCT replaces BPT for conventional pollutants, and BAT replaces BPT for non-conventional and toxic pollutants. BPT limitations must be met upon publication of the ELGs. EPA allows additional time after publication of ELGs for facilities to comply with BCT and BAT limitations.

The applicable technology based standards for the EOS Portland Steel Works facility are contained in 40 CFR 420 – Iron and Steel Manufacturing Point Source Category. These rules were published by EPA in 1982. On October 17, 2002, EPA published a final rule updating the Iron and Steel ELGs and amended this rule in August, 2005. However, EPA did not revise ELGs for vacuum degassing and hot forming, the two subcategories that apply to EOS. Thus, the technology based standards that apply to the EOS discharge continue to be based on the ELGs published in 1982. A review also found that no ELGs apply to the new spiral pipe mill operations. The applicable subcategory of 40 CFR 420 for the EOS facility and the production associated with the subcategory are presented in the table below.

Table 8
Applicable Technology Based Subparts & Production Levels

Subpart	Description	Production
Subpart G	Hot forming	4,536 kkg/day

Attachment A documents the calculations of the technology based effluent limitations. The following table presents the resulting technology based effluent limits based on the calculations in Attachment A.

Table 9
Technology Based Effluent Limitations

Parameter	Daily Max	Monthly Ave
TSS	1,030 kg/day	386 kg/day
Oil & Grease	258 kg/day	N/A
pH	Within the range of 6.0 – 9.0 at all times	

8.0 Comparison of Existing NPDES Permit Limits and Technology-based Limits

This section presents a comparison of the existing NPDES Permit limits with the technology-based limitations from EPA's effluent limitation guidelines. Since EOS did not request a mass load increase, the more stringent of either the existing NPDES Permit limits or the technology-based limitations will be used in the water quality analysis. For TSS and oil & grease, the existing NPDES Permit limits are more stringent than the limits calculated using the technology-based standards. Therefore, the existing NPDES permit limits will be used for the water quality analysis.

Existing pH limits are the same as the technology-based limits. The existing NPDES permit includes effluent limits for temperature and TDS. There are no corresponding technology-based limits for these pollutants. The appropriateness of the temperature and TDS limits in the existing NPDES permit will be evaluated in the water quality evaluation. The table below presents the more stringent of the existing NPDES permits limits and the technology based limits calculated above. These values will be used in the water quality evaluation in the next section.

Table 10
More Stringent of Technology-based and Existing Limits

Parameter	Daily Max	Monthly Ave
TSS	1,420 lb/day (644 kg/day)	532 lb/day (241 kg/day)
Oil & Grease	Shall not exceed 346 lbs/day (157 kg/day)	
pH	Within the range of 6.0 – 9.0 at all times	

Limits for lead and zinc were established at in internal monitoring point (Outfall 002). The Department is proposing to include the existing NPDES permit limits at this internal monitoring point since they are more stringent than the technology-based limits calculated above. A water quality analysis is presented below, determining whether discharge concentrations of lead and zinc have a reasonable potential to exceed water quality standards.

9.0 Water Quality Analysis

This section determines pollutants of concern and evaluates each parameter to determine whether the concentration of the pollutant in the discharge represents a "reasonable potential to exceed" water quality standards. If the discharge concentration of a particular pollutant has a reasonable potential to exceed water quality standards, then water quality based effluent limits are established for that pollutant. The water quality analysis is based on the NPDES Permit application data, discharge characteristics, Willamette River water quality data, and the mixing zone analysis referenced in Section 5.6, Mixing Zones.

9.1 Outfall 001 – Pollutants of Concern

Using effluent data from discharge monitoring reports, 303(d) parameters, and monitoring conducted for the NPDES permit application, the pollutants of concern were determined.

The pollutants of concern are TSS, pH, temperature, turbidity, antimony, arsenic, chromium, copper, iron, lead, nickel, and zinc. Analytical results for all volatile, semi-volatile, and base-neutral organic compounds were below detection limits. Pesticides/PCBs were also believed to be absent from this discharge. Thus, organic compounds and pesticides/PCBs are not included as pollutants of concern.

9.1.1 Total Suspended Solids

OAR 340-41 does not specify a water quality criterion for total suspended solids for the receiving water. The limits specified in section 8.0, *Comparison of Existing NPDES Permit Limits and Technology-based Limits* will be included in the proposed NPDES permit.

9.1.3 Turbidity

The water quality standard for turbidity is dependent on stream turbidity measurements. The standard states that no more than a 10% increase in stream turbidity levels is allowed relative to a control point immediately upstream of the discharge. The existing NPDES permit includes an effluent turbidity of no more than a 25 NTU increase of intake levels. With a dilution of 141 at the edge of the mixing zone, this effluent limit ensures compliance with the turbidity standard.

9.1.4 Total Dissolved Solids

OAR 340-041-0032 states that instream concentration of total dissolved solids (TDS) may not exceed 100 mg/L unless specifically authorized by the Department. The Department had included a TDS effluent limit of 1136 mg/L in the 2004 NPDES permit based on water quality analysis. Recent discharge monitoring data (January 2007 through February 2008) show that the average TDS level in the discharge was 415 mg/L with a maximum of 640 mg/L. The Department is proposing to include the same TDS limit in this permit modification.

9.1.5 Temperature

This segment of the Willamette River serves as a migration corridor for salmonids. OAR 340-041-0028(4)(d) states that the 7-day average maximum temperature of a stream identified as a migration corridor may not exceed 20 ºC (68 ºF). For streams that do not meet water quality standards, OAR 340-041-0028(12) states the following:

> "Following a temperature TMDL or other cumulative effects analysis, waste load and load allocations will restrict all NPDES point sources and nonpoint sources to a cumulative increase of no greater than 0.3 degrees Celsius (0.5 Fahrenheit) above the applicable criteria after complete mixing in the water body, and at the point of maximum impact."

Since a temperature TMDL has been completed for the Willamette River, the above provision from OAR 340-041-0028(12) applies. The TMDL gave a "bubble allocation" to all of the smaller point sources (including EOS) in the middle and lower reach of the Willamette River (RM 50 to 0). Individual allocations were not assigned to sources under the bubble allocation. Rather, the TMDL allows the smaller sources to discharge at current limits and the Department tracks the total heat load used under the bubble allocation limit.

The temperature effluent limit, in the form of an excess thermal load, was based on an effluent temperature of 30 °C along with an effluent flow of 0.79 mgd. The excess thermal load was calculated using the following equation:

$$ETL = \Delta T * Q * C_p * SW * 0.252$$

Where:
ETL = Excess thermal load (10^6 Kcal/day)
ΔT = Maximum 7-day average of daily maximum effluent temperature 86ºF (30ºC) minus criterion 68ºF (20ºC) in degrees F
Q = Discharge flow (0.79 mgd)
C_p = Specific heat of water (1 Btu/lb ºF)
SW = Specific weight in lb/gallon (8.34 lb/gallon)
0.252 = conversion from million BTU/day to Kcals/day

Based upon the formula above, the excess thermal load for the OSM facility was given as 30 x 10^6 Kcal/day. The Department is proposing to include the same thermal limit in this permit modification.

<u>*Thermal Plume Criteria*</u>
The Department's water quality standards include temperature thermal plume limitations in OAR 340-041-0053(d). This section of the rules contains criteria to prevent potential adverse impacts that may result from thermal plumes. The temperature thermal plume limitations that the Department has adopted are similar to the recommendations in the April 2003 EPA Region X Temperature guidance. The criteria as they apply to EOS are discussed below:

- *OAR 340-041-0053(d)(A)*: Impairment of an active salmonid spawning area where spawning redds are located or likely to be located.
  EOS discharge: There is no salmonid spawning in this segment of the Willamette River. This segment of the Willamette River serves as a migration corridor for salmonids.

- *OAR 340-041-0053(d)(B)*: Acute impairment or instantaneous lethality is prevented or minimized by limiting potential fish exposure to temperatures of 32 ºC or more to less than 2 seconds.
  EOS discharge: The proposed permit includes an excess heat load limit based on 30 ºC. Effluent data collected over a ten month period (April 2003 to January 2004) indicates that the maximum effluent temperature of the discharge was 28 ºC. More recent data (November 2006 to October 2007) give a maximum discharge temperature of 25.1 ºC. Thus, the discharge is not expected to cause an acute impairment or instantaneous lethality.

- *OAR 340-041-0053(d)(C)*: Thermal shock caused by a sudden increase in water temperature is prevented or minimized by limiting potential fish exposure to temperatures of 25 ºC or more to less than 5% of the cross-section of 100% of the 7Q10 flow of the waterbody.
  EOS discharge: Analysis completed for the 2004 permit renewal indicated that the discharge achieves rapid mixing within a short distance. At a distance of 0.1 meters (about 0.3 feet) from the outfall, the resulting dilution during low flow conditions is 2.0. Assuming an effluent temperature of 30 ºC, the resulting stream temperature 0.3 feet from the outfall would be 25 ºC. The percentage of the cross-sectional area of the stream that would exceed 25 ºC was estimated using the model

predictions for plume width (1.5 feet) and the portion of the water column occupied by the plume (3 feet). The width of the Willamette River at the discharge location is about 1800 feet and the average water depth of 45 feet. Using these values, the estimated percentage of the cross-sectional area of the Willamette River that may exceed 25 ºC is about 0.005%. Thus, the cross-sectional area of the Willamette River that may exceed 25 ºC is well below 5%.

- *OAR 340-041-0053(d)(D)*: Unless ambient temperature is 21 ºC or greater, migration blockage is prevented or minimized by limiting potential fish exposure to temperatures of 21 ºC or more to less than 25% of the cross-section of 100% of the 7Q10 flow of the waterbody.
  EOS discharge: Analysis completed for the 2004 permit renewal indicated that the discharge is not expected to increase temperature at the edge of the mixing zone by more than 0.3 ºC. Modeling shows that the expected dilution 6 feet from the outfall would reduce temperatures within the mixing zone to 21 ºC. The percentage of the cross-sectional area of the stream that would exceed 21 ºC was estimated using the model predictions for plume width (5.5 feet) and the portion of the water column occupied by the plume (7.3 feet). The width of the Willamette River at the discharge location is about 1800 feet and the average water depth of 45 feet. Using these values, the estimated percentage of the cross-sectional area of the Willamette River that may exceed 21 ºC is about 0.05%. Thus, the cross-sectional area of the Willamette River that may exceed 21 ºC is well below 25%.

Thus, the analysis shows that the discharge from the OSM facility meets the temperature thermal plume limitations in OAR 340-041-0053(d).

9.1.6 pH

The water quality standard for pH for this segment of the Willamette River is 6.5 – 8.5. The pH limit in the 2004 NPDES permit is 6.0 – 9.0. With the dilution available within the mixing zone, the discharge from the OSM facility will be able to meet the water quality standard for pH. Thus, the pH limits of 6.0 – 9.0 contained in the 2004 permit are proposed to remain unchanged.

9.1.7 Oil & Grease

Water quality standards do not specify a numeric standard for oil & grease. However, the rules do include a prohibition against objectionable discoloration, scum, oily sleek or floating solids, or coating of aquatic life with oil films. The 2004 permit contains a 15 mg/L concentration limit that addresses the narrative standard as well as the mass-based technology based limit specified in Section 7.0. It is proposed that this concentration limit remain unchanged.

9.1.8 Toxic Pollutants

Based on a review of the DMR data and the analytical data submitted with the NPDES permit application, the toxic pollutants of concern at outfall 001 are total residual chlorine, antimony, arsenic, chromium, copper, iron, lead, nickel, and zinc. An evaluation was conducted to determine whether the levels of these pollutants in the discharge have a “reasonable potential to exceed” water quality standards. As discussed in the next section, the waste stream from the spiral pipe cleaning operation (which contains phosphoric acid) has also been a concern for toxicity. The wastewater from this operation has been rerouted to discharge to the sanitary sewer system and is therefore no longer covered under this permit.

When determining whether a discharge has the potential to exceed water quality standards, the Department accounts for the variability of the effluent. A multiplier is used to account for effluent variability in accordance with the methods outlined in EPA's *Technical Support Document for Water Quality Based Toxics Control* (March 1991). To determine whether the discharge has a reasonable potential to exceed water quality standards for these pollutants, a spreadsheet that simulates the approach in EPA's *Technical Support Document for Water Quality Based Toxics* was used. Maximum probable effluent concentrations (based on the multiplier), water quality criteria, and mixing zone dilution data are used to determine whether the discharge has a reasonable potential to exceed water quality standards.

The City of Portland has been collecting high resolution metals data in the lower portion of the Willamette River. Because the City of Portland data is developed using state-of-the-art analytical techniques and is of high quality, the Department is using the data in the water quality analysis. The data collected at the St. John's Railroad Bridge (River Mile 6.8) was used in the analysis.

The results of the reasonable potential analysis related to aquatic life and human health are included in Attachments B and C. A similar analysis was performed for chlorine. These results indicate that the discharge does not have a reasonable potential to exceed water quality standards or will have no measurable impact on instream water quality at the edge of the mixing zone for any of the pollutants of concern identified above, except arsenic. Arsenic is discussed below.

While there is no reasonable potential for the exceedances of the chlorine criteria, the Department is proposing to retain the existing effluent limits for chlorine. Also, the department is proposing to retain the existing effluent limits for lead and zinc at the vacuum degassing process wastewater internal monitoring point.

<u>Arsenic</u>: Arsenic is found at naturally occurring elevated levels in many of the streams in Oregon, including the Willamette River. The total arsenic concentration in the facility's effluent was measured at 3.8 µg/L. (The Willamette River's total arsenic concentrations have been measured at this location at approximately 1 µg/L.) However, it is generally accepted that the toxic form of arsenic is the inorganic fraction. The Department is currently evaluating its arsenic water quality standard and most likely will be proposing a standard based on the inorganic form of arsenic. The proposed permit requires Evraz to implement a monitoring program that will allow a more robust analysis of the potential impacts of the effluent arsenic on the Willamette River.

9.1.9 Whole Effluent Toxicity Testing

The 2004 NPDES Permit required OSM to conduct quarterly whole effluent toxicity (WET) testing of the discharge from outfall 001 once per year. WET testing was conducted using *Pimephales promelas* (fathead minnow), *Ceriodaphnia dubia* (water flea) and *Raphidocelis subcapitata* (green alga formerly known as *Selanastrum capricornutum*). An acute WET test is considered to show toxicity if the "No Observed Effect Concentration" (NOEC) occurs at dilutions greater than that which is found at the edge of the zone of immediate dilution (ZID). A chronic WET test is considered to show toxicity if "a significant difference in survival, growth or reproduction" occurs at dilutions greater than that which is known to occur at the edge of the mixing zone.

None of the WET testing conducted under the 2004 permit indicated that the discharge exhibited toxicity, with exception of the September 2007 test. This test indicated that the effluent exhibited acute toxicity (it had an observable effect on Ceriodaphnia dubia) at concentrations observed outside of the zone of initial dilution. The facility traced the source of this problem to the discharge from the spiral pipe cleaning operations. The phosphoric acid included in this discharge is thought to have lead to the toxicity results. To address this problem, the facility has diverted wastewater from this process to the sanitary sewer.

9.2 Other Outfalls

Outfall 002 (formerly Outfall 004) is the discharge from the river water intake solids separators located on the dock. Willamette River water is pumped through these two inline solids separators ("centricleaners") to remove larger particles present in the raw river water. Since the addition of an intake screen and the relocation of the water intake to a location nearer to the river surface, this unit appears to have minimal functionality and primarily returns some water, at a rate of about 3 gpm during periodic flushing, back to the river at Outfall 002 (formerly Outfall 004).

The "centricleaner" unit process removes material that is larger than 200 mesh (0.074 mm). Material that passes this size screen is typically classified as clay and the smaller colloidal particles. The material that is removed by this screen would typically be fine sand or larger particles. Turbidity is typically related to colloidal particles or clay because the larger particles do not scatter light significantly and therefore do not cause turbidity. Therefore, the discharge is not expected to cause turbidity problems in the receiving stream. However, the Department is proposing that EOS continue with the existing visual monitor turbidity in the river on a weekly basis.

Since the centricleaner unit strains solids particles out of the water pumped from the river, it is not expected to increase TDS levels above background levels. Thus, no effluent limit for TDS is proposed. A sample was taken and analyzed for copper, lead and zinc. The analytical results were below detection limits for all three pollutants. Thus, effluent limits are not deemed to be necessary for these pollutants.

10.0 Compliance History

During the current permit period (starting June 2004) EOS has consistently complied with the conditions in the NPDES permit with two exceptions. In September of 2004 the Department issued a notice of noncompliance to EOS (Oregon Steel Mills at the time) for the exceedances of an effluent limit for oil & grease reported in the July 2004 discharge monitoring report. Also, EOS received a warning letter for a violation of the permit requirements pertaining to whole effluent toxicity (WET) testing. This violation was related to the issue of toxicity discussed in section 9.1.9, above. To address this problem, the facility has diverted wastewater causing the toxicity to the sanitary sewer.

11.0 Discussion of NPDES Permit

11.1 NPDES Permit Outline

The proposed NPDES permit is organized into a cover page and several schedules that are discussed further in this section. The schedules include:

- Schedule A - Waste Discharge Limitations
- Schedule B - Minimum Monitoring and Reporting Requirements
- Schedule C - Compliance Conditions and Schedules – Not Applicable
- Schedule D - Special Conditions
- Schedule E - Not Applicable (this schedule is reserved for federal pretreatment requirements for publicly owned treatment works and is not applicable to this permit)
- Schedule F - General Conditions

11.2 Cover Page

The cover page of the NPDES permit identifies the types of wastewater that EOS discharges. This changes on this page relate to the application date for the permit renewal, the inclusion of groundwater dewatering (with treatment) to the listed sources and the name change of Outfall 004 to 002.

11.3 Schedule A – Waste Discharge Limitations

The 2003 NPDES permit included effluent limits at outfall 001, at an internal monitoring point (discharge from the vacuum degasser) and at the discharge from the intake water solids separator (outfall 002 – formerly 004). No changes are proposed to the effluent limits.

The proposed effluent limits at outfall 001 are specified in the table below.

Table 11
Proposed NPDES Permit Limits for Outfall 001

Parameter	Daily Max	Monthly Ave
Flow	0.79 MGD	N/A
TSS	1,420 lb/day (644 kg/day)	532 lb/day (241 kg/day)
Oil & Grease	15 mg/L	N/A
Turbidity	Must not exceed 25 NTU above stream background levels (to be measured at river intake)	
Total Dissolved Solids	N/A	1136 mg/L
Total Residual Chlorine	0.34 mg/L	0.17 mg/L
Excess Thermal Load (May – October)	30×10^6 Kcal/day (7-day moving average of daily maximum excess thermal load)	
pH	Within the range of 6.0 – 9.0 at all times	

The Department is proposing to retain the flow limit in the NPDES permit and the provision to allow OSM to discharge at higher flow rates during emergency situations and during storm events.

The Department is also proposing to retain the following limits at the internal monitoring point, which is the discharge from the vacuum degassing process.

TABLE 12
PROPOSED NPDES PERMIT LIMITS FROM VACUUM DEGASSING PROCESS (INTERNAL MONITORING POINT)

Parameter	Daily Max	Monthly Ave
Lead (total recoverable)	0.23 lb/day (0.106 kg/day)	0.078 lb/day (0.035 kg/day)
Zinc (total recoverable)	0.35 lb/day (0.16 kg/day)	0.117 lb/day (0.053 kg/day)

A visual limit for turbidity is proposed to remain in effect at outfall 002, the discharge from the intake solids separator. This portion of the NPDES Permit also specifies the mixing zone and ZID dimensions of each permitted outfall for which effluent limits are assigned. The proposed NPDES permit retains a mixing zone of 100 feet (30.5 meters) and a ZID of 10 feet (about 3 meters) at outfall 001. No changes are proposed to the mixing zone and ZID at outfall 002 (formerly 004).

11.4 Schedule B – Minimum Monitoring and Reporting Requirements

11.4.1 Monitoring Requirements

The 2004 NPDES permit specified the parameters to be monitored and the monitoring frequencies at outfalls 001, 002 (formerly 004) and the internal monitoring point. For the proposed permit, the monitoring requirements for outfall 001 have been augmented to include quarterly WET testing for the first year, and the collection of up to10 additional samples of metals, cyanide, and total phenols and 5 additional samples of organic compounds. These additional samples are necessary to better characterize the effluent for analyses to be performed during the next permit renewal. For outfall 001, the monitoring frequencies and the parameters to be monitored are specified Table 13, below.

Table 13 Proposed Monitoring Requirements for Outfall 001		
Parameter	**Minimum Frequency**	**Sample Type**
Flow	Daily	Continuous Recorder
TSS	2/week	Composite
Oil & Grease	2/week	Grab
pH	Daily	Grab
Turbidity	2/week	Composite
TDS	2/week	Composite
Temperature	Daily	Continuous Recorder
Chlorine (total residual)	2/week	Grab
Whole Effluent Toxicity Testing	Once per year	Composite
Metals (total), cyanide and total phenols	2/year	Composite
Volatile compounds, acid-extractable compounds, base-neutral compounds	1/year	Composite

Various notes related to monitoring are included in the permit. These explain that monitoring is not required when there is no discharge, how samples are to be collected, that WET testing is to be performed quarterly for one year if toxicity is observed, that toxics monitoring of individual parameters may be suspended after two years if all data are non-detectable and other monitoring details (please see the proposed permit for details).

For the continuous temperature monitoring, the permit requires OSM to report the following data:

Table 14 Temperature Reporting Requirements for Outfall 001		
Parameter	**Minimum Frequency**	**Sample Type**
Daily Maximum Temperature	Daily	Calculate
7-day Average of Daily Maximum	Daily	Calculate
Excess Thermal Load (Daily Maximum)	Daily	Calculate
Excess Thermal Load (7-day Average of Daily Maximums)	Daily	Calculate

The 2004 NPDES permit required annual WET (bioassay) testing. As explained in section 9.1.9, the Department is proposing to increase the WET testing to quarterly for the first year. If no toxicity is indicated as a result of this testing, the monitoring frequency will revert to annual testing.

No changes are proposed for the monitoring requirements at the other locations in the NPDES permit.

- Internal monitoring point for the discharge from the Vacuum Degassing Process;
- Outfall 002 (formerly 004), the discharge from intake water solids separator; and
- Willamette River monitoring.

11.4.2 Reporting Requirements

No changes are proposed to the reporting requirements in the 2004 NPDES permit. The proposed NPDES permit requires monitoring reports to be submitted on a monthly basis. Monthly reports must be submitted by the 15th day of the following month. Since daily monitoring is required for some pollutants, EOS must submit a spreadsheet that contains the results of all required monitoring in addition to the EPA discharge monitoring form.

11.5 Schedule D – Special Conditions

The WET test language was updated to include a new dilution series that would reflect mixing zone and ZID dilutions. The WET language also includes updated and corrected references to guidance documents and other information. No other changes are proposed to Schedule D of the 2004 NPDES permit.

11.6 Schedule F – General Conditions

These conditions are standard to all NPDES permits and include language regarding operation and maintenance of facilities, monitoring and record keeping, and reporting requirements.

12.0 Next Steps

12.1 Public Comment Period

The proposed NPDES permit and this evaluation report will be made available for public comment. A public notice of the proposed permit will be mailed to parties on the Department's public notice mailing lists (WQ: PN (public notice) State, WQ: Multnomah County, and WQ: All Permits). To be included on the Department's mailing list, please visit our website at: http://www.deq.state.or.us/news/publicnotices/PN.asp and select the link "Sign up to get DEQ info by e-mail" on the left side of the page.

12.2 Response to Comments

The Department will respond to comments received during the comment period. All those providing comment will receive a copy of the Department's response. Interested parties may also request a copy of the Department's response. Once comments are received and evaluated, the Department will decide whether to issue the permit as proposed or make changes to the permit or deny the permit.

12.3 Modifications to Fact Sheet and Permit Evaluation Report

Depending on the nature of comment and any changes made to the proposed permit modification as result of comment, this fact sheet/evaluation report may be modified. The Department may also choose to update the fact sheet/evaluation report through a response to comments.

13.0 Attachments

Attachment A: Calculation of Technology-based Effluent Limitations
Attachment B: Aquatic Life Reasonable Potential Analysis for Outfall 001
Attachment C: Human Health Reasonable Potential Analysis for Outfall 001

Attachment A: Technology-based Effluent Limitations

Oregon Steel Mills - Rivergate
Iron & Steel Manufacturing Permit Limits

40CFR420 Subpart	Sect.	Guideline or Segment	Segment	Production kkg	TSS				Oil & Grease			
					Daily Maximum		Monthly Average		Daily Maximum		Monthly Average	
					ELG kg/kkg	Subtotal kg/d	ELG kg/kkg	Subtotal kg/d	ELG kg/kkg	Subtotal kg/d	ELG kg/kkg	Subtotal kg/d
G	.72(a)(2)	BPT	Hot Forming Primary Mills, Carbon & Specialty with Scarfing		0.22100	0.00000	0.08300	0.00000	0.0553	0.0000	0.0553	0.0000
	.72(b)(1)	BPT	Hot Forming Primary Mills, Section Mills, Carbon		0.35700	0.00000	0.13400	0.00000	0.0894	0.0000	0.0894	0.0000
	.72(c)(2)	BPT	Hot Forming Primary Mills, Carbon Plate Mills	4536	0.22700	1029.67200	0.08510	386.01360	0.0568	257.6448	0.0568	257.6448
	.74(a)(2)	NSPS	Hot Forming Primary Mills, Carbon & Specialty with Scarfing		0.02340	0.00000	0.00876	0.00000	0.0058	0.0000	0.0058	0.0000
	.74(b)(1)	NSPS	Hot Forming Primary Mills, Section Mills, Carbon		0.03340	0.00000	0.01250	0.00000	0.0083	0.0000	0.0083	0.0000
	.74(b)(2)	NSPS	Hot Forming Primary Mills, Section Mills, Specialty		0.02170	0.00000	0.00813	0.00000	0.0054	0.0000	0.0054	0.0000
	.74(c)(1)	NSPS	Hot Forming Primary Mills, Section Mills, Flat Mills, Hot Strip & Sheet Mills, Carbon & Specialty		0.04350	0.00000	0.01630	0.00000	0.0109	0.0000	0.0109	0.0000
	.74(c)(2)	NSPS	Hot Forming Primary Mills, Carbon Plate Mills		0.02340	0.00000	0.00876	0.00000	0.0058	0.0000	0.0058	0.0000
Limit Totals					1030		386		258		258	

Attachment B: Aquatic Life Reasonable Potential Analysis

Facility Name: Evraz Oregon Steel

Dilution Values? (Y/N)	y	calculated
Dilution @ ZID	18	*
Dilution @ MZ	141	*
If no dilution values enter info below		
Facility Effluent Flow	*	MGD
7Q10	*	CFS
1Q10	*	CFS
% dilution at ZID	*	%
% dilution at MZ	*	%
Fresh Water? (Y/N)	y	

Hardness	mg/L $CaCO_3$
Effluent	167
Stream	26
Mixed	
ZID	34
MZ	27

(Hardness values should be >25 and <400 mg/L)

Confidence Level	99%
Probability Basis	95%

PARAMETER	# of Samples	Highest Conc. See IMD	Coef. of Varience	Calculated Max Effluent Conc.	Background Conc. See IMD	Maximum Conc. at ZID	Maximum Conc. at MZ	WQ CRITERIA 1 Hour (CMC)	WQ CRITERIA 4 Day (CCC)	REASONABLE POTENTIAL ? ACUTE	REASONABLE POTENTIAL ? CHRONIC	ZID	MZ
		µg/l		µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	ACUTE	CHRONIC	ZID	MZ
ANTIMONY *	1	2.04	0.60	18.36	*	*	*	9000	1600	**NO**	**NO**		
ARSENIC V * (inorganic)	1	3.80	0.60	34.20	0.7	2.56	0.94	850	48	**NO**	**NO**		
CHROMIUM VI	1	0.70	0.60	6.30	1.14	1.43	1.18	16	11	**NO**	**NO**		
COPPER +	48	46.00	0.40	50.60	1.87	4.58	2.22	6.4	3.9	**NO**	**NO**	**ZID**	**MZ**
IRON ‡	27	103.00	0.79	164.80	*	*	*	2000	1000	**NO**	**No**		
LEAD +	1	0.14	0.60	1.26	0.31	0.36	0.32	21	0.60	**NO**	**NO**		**MZ**
NICKEL +	1	46.50	0.60	418.50	0.93	24.13	3.89	567	52	**NO**	**NO**		**MZ**
ZINC +	9	295.00	0.60	649.00	3.57	39.43	8.15	47	35	**NO**	**NO**	**ZID**	**MZ**

NOTES :

All units in ug/L

* Insufficient data to develop criteria; value presented is the Lowest Observed Effect Level

+ Fresh water criterion is hardness dependent

The "calculated max effluent conc." values for Antimony and Iron are below the criteria, therefore the discharge has no reasonable potential regardless of background concentration.

Attachment C: Human Health Reasonable Potential Analysis

Facility Name: **Evraz Oregon Steel**

			Dilution Model	Dilution Calculated
Dilution Values?	n			
Harmonic Mean Flow (cfs)	(See IMD)	17000		140.1
30Q5 (cfs)	(See IMD)	7110		59.2
Effluent Flow (mgd)	(See IMD)	0.79		
% Dilution		1%		

Confidence Level	95%
Probability Basis	95%

PARAMETER	Carcinogen?	# of Samples	Effluent Conc. See IMD	Coef. of Varience	Calculated Max Effluent Conc.	Background Conc. See IMD	Maximum conc at regulatory boundary	WQ CRITERIA Water and Fish Ingestion	WQ CRITERIA Fish Consumption	Reasonable Potential? Water and Fish Ingestion	Reasonable Potential? Fish Consumption
	Y or N		µg/l		µg/l	µg/l	µg/l	µg/l	ug/L		
ANTIMONY	N	1	2.04	0.60	12.64	0	0.2137	5.6	640	**NO**	**NO**
CHROMIUM VI	N	1	0.07	0.60	0.43	1.14	1.1281	50	N/A	**NO**	*
IRON	N	27	103.00	0.79	133.90	*	*	300	*	**NO**	*
LEAD	N	1	0.14	0.60	0.87	0.31	0.3194	50	N/A	**NO**	*
MANGANESE	N	1	5.00	0.60	31.00	*	*	50.000	100.00	**NO**	**NO**

Notes:

Iron and Mn criteria are the dissolved fraction.
Iron effluent values are total recoverable.
The effluent Mn value is dissolved as calculated from a site specific converstion factor (0.58)
The Willamette River is water quality limited (303d listed) for Iron and Manganese. Therefore, the "calculated max effluent conc." value must be at or below the applicable WQ Criteria for a "no reasonable potential" conclusion. Both of the values for Iron and Manganese are below the criteria.