# FACT SHEET FOR NPDES PERMIT WA0040851

# STEELSCAPE, INC.

2/24/2005

**TABLE OF CONTENTS**

## INTRODUCTION

The Federal Clean Water Act (FCWA, 1972, and later modifications, 1977, 1981, and 1987) established water quality goals for the navigable (surface) waters of the United States. One of the mechanisms for achieving the goals of the Clean Water Act is the National Pollutant Discharge Elimination System (NPDES) of permits, which is administered by the Environmental Protection Agency (EPA). The EPA has authorized the state of Washington to administer the NPDES permit program. Chapter 90.48 Revised Code of Washington (RCW) defines the Department of Ecology's (Department) authority and obligations in administering the wastewater discharge permit program.

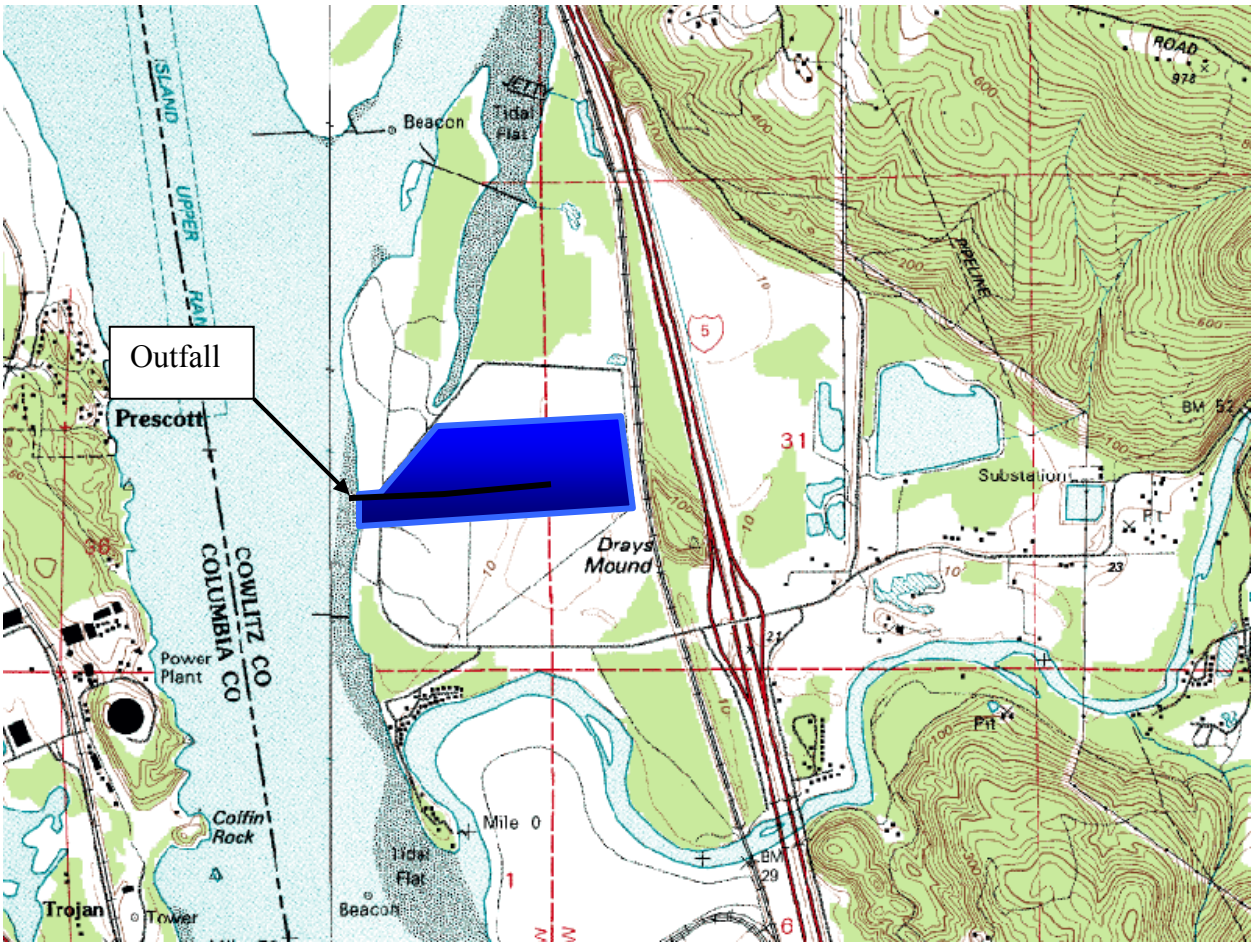
The regulations adopted by the state include procedures for issuing permits [Chapter 173-220 Washington Administrative Code (WAC)], water quality criteria for surface and ground waters (Chapters 173-201A and 200 WAC), and sediment management standards (Chapter 173-204 WAC). These regulations require that a permit be issued before discharge of wastewater to waters of the state is allowed. The regulations also establish the basis for effluent limitations and other requirements which are to be included in the permit. One of the requirements (WAC 173-220-060) for issuing a permit under the NPDES permit program is the preparation of a draft permit and an accompanying fact sheet. Public notice of the availability of the draft permit is required at least 30 days before the permit is issued (WAC 173-220-050). The fact sheet and draft permit are available for review (see Appendix A--Public Involvement of the fact sheet for more detail on the Public Notice procedures).

The fact sheet and draft permit have been reviewed by the Permittee. Errors and omissions identified in this review have been corrected before going to public notice. After the public comment period has closed, the Department will summarize the substantive comments and the response to each comment. The summary and response to comments will become part of the file on the permit and parties submitting comments will receive a copy of the Department's response. The fact sheet will not be revised. Comments and the resultant changes to the permit will be summarized in Appendix D--Response to Comments.

**Table 1 General Information**

| | |
|---|---|
| Applicant | Steelscape, Inc. |
| Facility Name and Address | Steelscape, Inc.<br>222 West Kalama River Road<br>Kalama, Washington 98625 |
| Type of Facility | Cold-Rolled and Steel Sheet, Strip, and Bars |
| SIC Code | 3316 |
| Discharge Location | Waterbody name: Columbia River @ RM 72.2<br>Latitude: 46° 02' 40" N<br>Longitude: 122° 52' 30" W |
| Water Body ID Number | WA-CR-1010 |

**Figure 1 Topographical map of the facility vicinity; scale 1:50,000**



## BACKGROUND INFORMATION

### *DESCRIPTION OF THE FACILITY*

The facility name is Steelscape, Inc. (Steelscape). It was formerly know as BHP Coated Steel Corporation. The facility is located in Kalama, Washington.

The site is on Port of Kalama property, bordered by Burlington Northern Railroad to the east, West Kalama River Road to the south, the Columbia River to the west, and Port of Kalama domestic sewage treatment plant (the POTW) to the north. The legal description of the site is Section 31, Township 7N, Range 1 W; Section 36, Township 7N, Range 2W, Willamette Meridian. Steelscape is sharing an outfall with the Publicly Owned Treatment Works (POTW).

At this time, Steelscape has no committed future plans, although a request to use effluent discharge for dust suppression has been submitted to the Department.

Approximately 170 operators and 30 managers and engineers work at Steelscape. The company corporate offices located next door employ 80 people. The production lines operate 24 hours a day, seven days a week, in a standard three shift work schedule. Production operations are fairly consistent year round with very little seasonal variation. Wastewater flows are also fairly consistent due to the continuous operation of the production lines.

HISTORY

Construction began on the facility in November of 1995. Pickle line operations began March 23, 1997. Overall plant operations started August 1, 1997. The industrial wastewater treatment facility was operational when the pickle line operations began.

### *INDUSTRIAL PROCESS*[1]

*Facility*

Steelscape is a facility for cold rolling and coating of steel strip. The facility is classified under SIC code of 3316 and includes four principal production lines:

1. Pickle Line

2. Cold Rolling Mill

3. Metallic [Zinc] Coating Line

4. Coil Paint Line.

All four principal production lines generate wastewater. Additional sources of wastewater are boilers, cooling towers, and water demineralizer.

[1] A full description of industrial process is provided in Raytheon's Engineering Report, 1996.

SUMMARY OF PRODUCTION

A summary of Steelscape's production is listed in *Table 2*.

**Table 2 Production rates at 100% efficiency**

| Line | Short tons per year | Tonnes (t) per year | Tonnes per day | Square meters per day |
|---|---|---|---|---|
| **Pickle Line** | 500,000 | 453,592 | 1340 | |
| **Cold Rolling Mill** | 488,000 | 442,706 | 1308 | |
| **Metallic Coating Line** | 270,000 | 244,940 | 724 | 155,096 |
| **Coil Paint Line** | 108,000 | 97,976 | 289 | 73,855 |

## FACILITY WATER MANAGEMENT[2]

*Design Water Usage and Disposal Overview*

The design total plant water usage was 534,890 gallons per day (gpd) or 371 gallons per minute (gpm) from the City of Kalama municipal water supply. Major water uses include cooling towers, steam system and process areas. The process areas include the pickle line, cold rolling mill, metallic coating line, and the paint line. Demineralizers produce 173,280 gpd of demineralized (demin) water to be used in the processes and in the boilers to make steam. The boilers (rated for 30,000 lbs per hour) produce the steam equivalent of 70,560 gpd of water. Evaporation from the cooling towers accounts for 216,060 gpd of water lost to the atmosphere. The processes account for another 128,880 gpd of evaporation. Domestic waste (8,000 gpd) is treated offsite by the Port of Kalama Municipal Wastewater Treatment System. Some water leaves the process with wastes that are transported offsite such as spent pickle liquor. The remaining water is treated in the industrial waste treatment which consists of an oily waste system and a metal wastewater treatment system. All values said above are maximum gallons per day. Instantaneous maximums may be higher.

SUMMARY OF WATER USAGE

A summary of Steelscape's water usage is listed in *Table 3*.

[2] A full description of facility water management is provided in Raytheon's Engineering Report, 1996.

**Table 3: Steelscape water usage**

| Activity | Water Usage | |
|---|---|---|
| | **[gallons per day (gpd)]** | **% of total water usage** |
| Design total water usage | 534,890 | 100 |
| 1) Demineralizers production (water used in processes and in the boilers to make steam) | 173,280 | 32 |
| • Rolling Mill | 89,280 | 17 |
| • Boiler system | 70,560 | 13 |
| a) Pickle Line | 17,280 | 3.2 |
| b) Zincalume® Line | 28,800 | 5.4 |
| c) Paint Line | 23,040 | 4.3 |
| d) Cooling tower | 1,440 | 0.3 |
| • Paint Line | 1,440 | 0.3 |
| 2) Pickle Line | 55,730 | 10 |
| 3) Zincalume® Line | 48,240 | 9.0 |
| 4) Paint Line | 15,840 | 3.0 |
| 5) Cooling tower | 219,580 | 41 |
| 6) Wastewater treatment | 15,220 | 2.8 |
| • Oily wastewater treatment | 500 | 0.1 |
| • Metal wastewater treatment | 14,720 | 2.8 |
| 7) Domestic | 8,000 | 1.5 |

## *DESCRIPTION OF WASTEWATER TREATMENT PLANT*[3]

*Overview*

The industrial waste water treatment plant for the Pacific Northwest Flat Products facility encompasses two distinct process systems. The first is an "oily waste" treatment process which pre-treats all plant waste waters that are potentially contaminated with oils or grease. The second system for "Metal Waste" is a physical/chemical treatment process for reduction of metals and insoluble contaminants from all industrial waste water streams (including the pretreated oily waste streams) prior to their discharged to the environment.

All equipment associated with the industrial wastewater treatment plant is located in a common area within the facility; and with the exception of a waste oil storage tank and two waste blending tanks (one for each treatment process), the industrial wastewater treatment system is located indoors in Area 17, the Utilities Building. The industrial wastewater treatment plant was designed to operate continuously, 24 hours per day. Equipment redundancy and waste retention capacity was incorporated into the system to obtain optimum reliability. There are no system bypass provisions; all industrial waste is treated prior to discharge to the environment.

OILY WASTE SYSTEM

The oily waste system treats waste streams from the Cold Roll Mill, Metallic Coating and Coil Paint lines which are associated with oil processing. This system produces effluent for discharge to the metal waste system and also produces oily sludge for off-site disposal.

The system is designed to receive both intermittent and continuous flows. Although only a portion of the waste streams flow continuously, the waste treatment process will operate continuously. A blending tank allows for mixing of continuous and intermittent streams prior to treatment. The oily waste treatment system was designed to process a combined oily waste stream having the characteristics presented in *Table 4* at a design service rate of 60 gpm (86,400 gpd).

**Table 4 Design criteria for the oily waste treatment system**

| Constituent | Units | Concentration |
|---|---|---|
| **Flow** | Gallons per minute (gpm)<br>Gallons per day (gpd) | 60<br>86,400 |
| **NaOH** | Milligrams per liter (mg/L) | 12,250 |
| **Oil** | mg/L | 3,025 |
| **Zn** | mg/L | 2 |
| **Al** | mg/L | 35 |

[3] A full description of wastewater treatment plant is provided in Raytheon's Engineering Report, 1996.

| Constituent | Units | Concentration |
|---|---|---|
| **Fe** | mg/L | 460 |
| **Cr** | mg/L | 0.1 |
| **$PO_4$** | mg/L | 38 |
| **TSS** | mg/L | 15 |

The oily waste system consists of the *following* principle components:

- Oily Waste Collection System
- Oily Waste Blending System
- Oil Water Separation System Stage 1 and 2
- Waste Oil Holding and Discharge System
- Treated Oily Waste Holding and Discharge System
- Hydrochloric Acid Feed System
- De-emulsifier Feed System
- Coagulant Feed System
- Polymer Feed System

METAL WASTE SYSTEM

The metal waste system treats waste streams from the Pickle line, Metallic Coating line, Coil Paint line and miscellaneous facility auxiliary waste (demineralizer regenerant waste and cooling tower blowdowns). It also processes the clear effluent from the oily waste system. This system produces liquid effluent for discharge to the Columbia River and solids (filter cake) for removal from the site.

The system is designed to receive both intermittent and continuous flows. Although only a portion of the waste streams flow continuously, the waste treatment process will operate continuously. A blending tank allows for mixing of continuous and intermittent streams prior to treatment. The metal waste is chemically reduced, neutralized, oxidized, coagulated, precipitated, clarified, filtered, and the resultant sludge dewatered into a cake for disposal. The metal waste treatment system was designed to process the combined industrial waste stream having the characteristics presented in *Table 5*.

**Table 5 Design criteria for the metal waste treatment system**

| Constituent | Units | Concentration |
|---|---|---|
| **Flow** | Gallons per minute (gpm)<br>Gallons per day (gpd) | 125<br>180,000 |

| | | |
|---|---|---|
| **HCl** | Milligrams per liter (mg/L) | 3,440 |
| **NaCl** | mg/L | 15,000 |
| **Oil** | mg/L | 10 |
| **Zn** | mg/L | 5 |
| **Al** | mg/L | 24 |
| **Fe** | mg/L | 390 |
| **Cr** | mg/L | 25 |
| **$PO_4$** | mg/L | 55 |
| **TSS** | mg/L | 100 |

The metal waste process consists of the following:

- Metal Waste Collection System
- Metal Waste Blending System
- Chromium Reduction System
- Neutralization/Oxidation System
- Flocculation and Clarification System
- Filtering System
- Sludge Dewatering System
- Treated Waste Holding and Discharge System
- Sodium Hydroxide Feed System
- Sodium Meta-bisulfite Feed System
- Polymer Dilution and Delivery System

SUMMARY OF WASTEWATER DISCHARGE

Summary of Steelscape wastewater discharge is listed in *Table 6*. Evaporation of 345,000 gpd from the cooling towers and processes accounts for 64 percent of the water usage. Thirty four (34) percent of the water, or 180,000 gpd, is treated in the industrial wastewater treatment system and then discharged to the Columbia River. The remaining two percent of the water leaves the plant with the domestic sewage or the liquid wastes such as spent pickle liquor that will be transported off site for treatment and disposal.

**Table 6: Steelscape wastewater discharge**

| Activity/Wastewater Type | Wastewater discharge | |
|---|---|---|
| | [gallons per day (gpd)] | % of total water usage |
| 1) Metal wastewater treatment | 180,000 | 34 |
| 2) Water lost to evaporation | 344,140 | 64 |
| • Pickle Line | 4,320 | 0.8 |
| • Rolling Mill | 88,480 | 17 |
| • Zincalume® Line | 23,040 | 4.3 |
| • Paint Line | 12,240 | 2.3 |
| • Cooling tower | 216,060 | 40 |
| 3) Net loss of water with spent pickle liquor | 2,450 | 0.5 |
| 4) Domestic waste (treated offside by the Port of Kalama Municipal Wastewater Treatment System) | 8,000 | 1.5 |

***DISCHARGE OUTFALL***

Treated effluent from the facility is discharged to the Columbia River via a submerged outfall pipe with a diffuser. A four-port, submerged diffuser is positioned 200 feet from shore at the south end of a wharf. The outfall is shared with the Port of Kalama sewage treatment plant. The two treated wastewater streams are combined and then discharged to the Columbia River @ RM 72.2 through the shared outfall.

***PERMIT STATUS***

The previous permit for this facility was issued on September 14, 1998. The previous permit placed effluent limitations as listed in *Table 7*.

**Table 7: Previous permit effluent limitations**

| EFFLUENT LIMITATIONS: OUTFALL # 001 | | |
|---|---|---|
| **Parameter** | **Average Monthly[1,5,6]** | **Maximum Daily[2,4,6]** |
| Flow, MGD [millions of gallons per day] | ---- | 0.180 |
| pH, std. units | Between 6.0 and 9.0 | |
| TSS [total suspended solids], kg/day [kilograms per day] | 11 | 23 |

| EFFLUENT LIMITATIONS: OUTFALL # 001 | | |
|---|---|---|
| **Parameter** | **Average Monthly[1,5,6]** | **Maximum Daily[2,4,6]** |
| Oil and Grease, kg/day | 4.6 | 11 |
| Temperature, °C [degree Celsius] | ---- | 35 |
| Chromium (Total), kg/day | 0.024 | 0.060 |
| Copper, kg/day | 0.034 | 0.072 |
| Cyanide, kg/day | 0.013 | 0.032 |
| Iron, kg/day | 0.10 | 0.20 |
| Lead, kg/day | 0.045 | 0.14 |
| Mercury, kg/day | 0.0010 | 0.0020 |
| Silver, kg/day | 0.014 | 0.029 |
| Zinc, kg/day | 0.13 | 0.34 |
| Naphthalene, kg/day | ---- | 0.0022[(3,4)] |
| Tetrachloroethylene, kg/day | ---- | 0.0031[(3,4)] |
| WET [whole effluent toxicity] (acute)<br>WET (chronic) | The permittee should note that there also may be additional effluent limits in section S5. Acute Toxicity and S6. Chronic Toxicity. | |

Footnotes for *Table 7*:

(1) 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.

(2) The maximum daily effluent limitation is defined as the highest allowable daily discharge.

(3) The MDL for naphthalene is 1.6 µg/L using gas chromatography/mass spectrometry and method number 625 from 40 CFR Part 136. The quantitation level (QL) for naphthalene is 10 µg/L.

The MDL for tetrachloroethylene is 4.1 µg/L using gas chromatography/mass spectrometry and method number 624 from 40 CFR Part 136. The quantitation level (QL) for tetrachloroethylene is 10 µg/L.

These QLs will be used for assessment of compliance with these effluent limits. If the Permittee is unable to attain the MDL and QL in its effluent due to matrix effects, the Permittee shall submit a matrix specific MDL and QL to the Department by July 1, 1997. The matrix specific MDL and QL shall be calculated as follows:

MDL = 3.14 x (standard deviation of 7 replicate spiked samples). This corresponds to the calculation of the method detection limit, as defined in 40 CFR Part 136, Appendix B, with the provision that the MDL be calculated for a specific effluent matrix.

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 the Permittee's records. All check standard recovery data and duplicate measurements shall be submitted to the Department in the discharge monitoring report. The Department's precision goal is +/- 20 percent.

(4) If the measured effluent concentration is below the QL, the Permittee shall report NQ for non-quantifiable.

(5) Average values shall be calculated as follows: measurements below the MDL = 0; measurements greater than the MDL = the measurement.

(6) When sample measurements for compliance with mass-based limits fall below the MDL, the average loading shall be calculated using a concentration value of zero. When sample measurements for compliance with mass-based limits fall above the MDL, the average loading shall be calculated using the measured concentration.

An application for permit renewal was submitted to the Department on December 26, 2001, and accepted by the Department on January 18, 2002.

## *SUMMARY OF COMPLIANCE WITH THE PREVIOUS PERMIT*

The facility last received an inspection on August 3, 2001.

*Table 8* summarizes Steelscape's compliance with the previous permit.

**Table 8 Summary of compliance**

| Parameter | Units | Type | Value | Min Limit | Max Limit | DMR Date |
|---|---|---|---|---|---|---|
| Iron, total (as Fe) | Kilograms per day (kg/day) | Average monthly | 0.14 | | 0.1 | 1-Feb-99 |
| Iron, total (as Fe) | kg/day | Maximum daily | 0.36 | | 0.2 | 1-Feb-99 |
| Iron, total (as Fe) | kg/day | Maximum daily | 0.277 | | 0.2 | 1-Jun-99 |
| Mercury, total (as Hg) | kg/day | Average monthly | 0.006 | | 0.001 | 1-Jan-99 |
| Mercury, total (as Hg) | kg/day | Maximum daily | 0.018 | | 0.002 | 1-Jan-99 |
| Naphthalene | kg/day | Maximum | 0.002 | | 0.002 | 1-Mar-99 |

| Parameter | Units | Type | Value | Min Limit | Max Limit | DMR Date |
|---|---|---|---|---|---|---|
| | | daily | | | | |
| Oil & grease | kg/day | Maximum daily | 14.7 | | 11 | 1-May-00 |
| pH | Standard units (S.U.) | RAN | 5.7 | 6.0 | 9.0 | 1-Mar-99 |
| pH | S.U. | RAN | 5.6 | 6.0 | 9.0 | 1-Sep-00 |
| Temperature | Degree Celsius (ºC) | Maximum daily | 37.4 | | 35 | 1-Oct-00 |
| Temperature | ºC | Maximum daily | 36 | | 35 | 1-Jan-01 |
| Temperature | ºC | Maximum daily | 38.4 | | 35 | 1-Jul-01 |

***FLOWS, SOURCES OF POLLUTION, AND TREATMENT PROCESSES***

**Table 9 Sources of pollution, flows, and treatment processes**

| Outfall Number | Operations Contributing Flow | | Treatment | | |
|---|---|---|---|---|---|
| | Operation | Average Flow | Description | Codes From *Table 10* | |
| 001 | Pickle Line Oily Waste | 600 | Steelscape, 2001, section 1.1.1 & 3.2 | 2-K,2-C,2-D,1-G,1-H | 2-L,2-K,2-C,2-D,1-U,1-P,4-A,5-R,1-C,5-Q |
| 001 | Pickle Line Metal Waste | 35000 | Steelscape, 2001, section 1.1.1 & 3.3 | | 2-L,2-K,2-C,2-D,1-U,1-P,4-A,5-R,1-C,5-Q |
| 001 | Cold Mill Oily Waste | 800 | Steelscape, 2001, section 1.1.2 & 3.2 | 2-K,2-C,2-D,1-G,1-H | 2-L,2-K,2-C,2-D,1-U,1-P,4-A,5-R,1-C,5-Q |
| 001 | Roll Shop Oily Waste | 1400 | Steelscape, 2001, section 1.1.2 & 3.2 | 2-K,2-C,2-D,1-G,1-H | 2-L,2-K,2-C,2-D,1-U,1-P,4-A,5-R,1-C,5-Q |

| Outfall Number | Operations Contributing Flow | | Treatment | | |
|---|---|---|---|---|---|
| | Operation | Average Flow | Description | Codes From *Table 10* | |
| 001 | Metal Coating Line Oily Waste | 35000 | Steelscape, 2001, section 1.1.3 & 3.2 | 2-K,2-C,2-D,1-G,1-H | 2-L,2-K,2-C,2-D,1-U,1-P,4-A,5-R,1-C,5-Q |
| 001 | Metal Coating Line Metal Waste | 700 | Steelscape, 2001, section 1.1.3 & 3.3 | | 2-L,2-K,2-C,2-D,1-U,1-P,4-A,5-R,1-C,5-Q |
| 001 | Paint Line Oily Waste | 4400 | Steelscape, 2001, section 1.1.4 & 3.2 | 2-K,2-C,2-D,1-G,1-H | 2-L,2-K,2-C,2-D,1-U,1-P,4-A,5-R,1-C,5-Q |
| 001 | Paint Line Metal Waste | 5400 | Steelscape, 2001, section 1.1.4 & 3.3 | | 2-L,2-K,2-C,2-D,1-U,1-P,4-A,5-R,1-C,5-Q |
| 001 | Utilities Oily Waste | 4300 | Steelscape, 2001, section 2.2.7 & 3.2 | 2-K,2-C,2-D,1-G,1-H | 2-L,2-K,2-C,2-D,1-U,1-P,4-A,5-R,1-C,5-Q |
| 001 | Utilities Metal Waste | 12000 | Steelscape, 2001, section 2.2.7 & 3.3 | | 2-L,2-K,2-C,2-D,1-U,1-P,4-A,5-R,1-C,5-Q |

**Table 10 Codes for treatment units**

| PHYSICAL TREATMENT PROCESSES | |
|---|---|
| 1-A .....Ammonia Stripping | 1-M.....Grit Removal |
| 1-B .....Dialysis | 1-N .....Microstraining |
| 1-C .....Diatomaceous Earth Filtration | 1-O .....Mixing |
| 1-D .....Distillation | 1-P .....Moving Bed Filters |
| 1-E.....Electrodialysis | 1-Q .....Multimedia Filtration |
| 1-F .....Evaporation | 1-R.....Rapid Sand Filtration |
| 1-G .....Flocculation | 1-S .....Reverse Osmosis *(Hyperfiltration)* |
| 1-H .....Flotation | 1-T .....Screening |
| 1-I.....Foam Fractionation | 1-U .....Sedimentation *(Settling)* |
| 1-J.....Freezing | 1-V .....Slow Sand Filtration |
| 1-K .....Gas-Phase Separation | 1-W.....Solvent Extraction |
| 1-L.....Grinding *(Comminutors* | 1-X .....Sorption |
| **CHEMICAL TREATMENT PROCESSES** | |
| 2-A .....Carbon Adsorption | 2-G .....Disinfection *(Ozone)* |
| 2-B .....Chemical Oxidation | 2-H .....Disinfection *(Other)* |
| 2-C .....Chemical Precipitation | 2-I.....Electrochemical Treatment |
| 2-D .....Coagulation | 2-J.....Ion Exchange |
| 2-E.....Dechlorination | 2-K .....Neutralization |
| 2-F .....Disinfection *(Chlorine)* | 2-L.....Reduction |
| **BIOLOGICAL TREATMENT PROCESSES** | |
| 3-A .....Activated Sludge | 3-E.....Pre-Aeration |
| 3-B .....Aerated Lagoons | 3-F.....Spray Irrigation/Land Application |
| 3-C .....Anaerobic Treatment | 3-G .....Stabilization Ponds |
| 3-D .....Nitrification-Denitrification | 3-H .....Trickling Filtration |
| **OTHER PROCESSES** | |
| 4-A .....Discharge to Surface Water | 4-C .....Reuse/Recycle of Treated Effluent |
| 4-B .....Ocean Discharge Through Outfall | 4-D .....Underground Injection |
| **SLUDGE TREATMENT AND DISPOSAL PROCESSES** | |
| 5-A .....Aerobic Digestion | 5-M.....Heat Drying |
| 5-B .....Anaerobic Digestion | 5-N .....Heat Treatment |
| 5-C .....Belt Filtration | 5-O .....Incineration |
| 5-D .....Centrifugation | 5-P .....Land Application |
| 5-E.....Chemical Conditioning | 5-Q .....Landfill |
| 5-F .....Chlorine Treatment | 5-R.....Pressure Filtration |
| 5-G .....Composting | 5-S .....Pyrolysis |
| 5-H .....Drying Beds | 5-T .....Sludge Lagoons |
| 5-I.....Elutriation | 5-U .....Vacuum Filtration |
| 5-J.....Flotation Thickening | 5-V .....Vibration |
| 5-K .....Freezing | 5-W.....Wet Oxidation |
| 5-L.....Gravity Thickening | |

***WASTEWATER CHARACTERIZATION***

The proposed wastewater discharge is characterized for the regulated by the permit parameters in ***Table 11*** and ***Figure 2*** to ***Figure 27***. The proposed wastewater discharge is also characterized for number of unregulated by the permit parameters in the permit application.

A detailed spreadsheet of all the data and copy of the permit application can be requested from:

Industrial Unit Permit Coordinator
Department of Ecology
Southwest Region - Water Quality
P.O. Box 47775
Olympia, WA 98504-7775

**Table 11 Wastewater characterization**

| Parameter | Permit limitations | | Maximum (and minimum for pH) Number Reported in Data Monitoring Reports (DMRs), November 1998—October 2003 | |
|---|---|---|---|---|
| | Average Monthly[1,5,6] | Maximum Daily[2,4,6] | Average Monthly | Maximum Daily |
| Flow, millions of gallons per day (MGD) | ---- | 0.180 | ---- | 0.16 |
| pH, std. units | Between 6.0 and 9.0 | | 5.6-8.92 (5.6 is below the limitation) | |
| Arsenic, micrograms per liter (µg/L) | ---- | ---- | 1.56 | 5 |
| Total suspended solids (TSS), kg/day | 11 | 23 | 6 | 15.9 |
| Oil and Grease, kilograms per day (kg/day) | 4.6 | 11 | 4.01 | 14.7 (excided limitation) |
| Temperature, °C | ---- | 35 | ---- | 38.4 (excided limitation) |
| Chromium (Total), kg/day | 0.024 | 0.060 | 0.013 | 0.03 |
| Copper, kg/day | 0.034 | 0.072 | 0.034 (at limitation) | 0.066 |
| Cyanide, kg/day | 0.013 | 0.032 | 0.011 | 0.022 |
| Iron, kg/day | 0.10 | 0.20 | 0.14 (excided limitation) | 0.36 (excided limitation) |
| Lead, kg/day | 0.045 | 0.14 | 0.02 | 0.08 |
| Mercury, kg/day | 0.0010 | 0.0020 | 0.006 | 0.018 |
| Silver, kg/day | 0.014 | 0.029 | 0.006 | 0.006 |
| Zinc, kg/day | 0.13 | 0.34 | 0.061 | 0.241 |

| Parameter | Permit limitations | | Maximum (and minimum for pH) Number Reported in Data Monitoring Reports (DMRs), November 1998—October 2003 | |
|---|---|---|---|---|
| | Average Monthly[1,5,6] | Maximum Daily[2,4,6] | Average Monthly | Maximum Daily |
| Naphthalene, kg/day | ---- | 0.0022[(3,4)] | ---- | 0.002 |
| Tetrachloroethylene, kg/day | ---- | 0.0031[(3,4)] | ---- | 0.001 |

Footnotes for *Table 11*:

(1) 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.

(2) The maximum daily effluent limitation is defined as the highest allowable daily discharge.

(3) The MDL for naphthalene is 1.6 µg/L using gas chromatography/mass spectrometry and method number 625 from 40 CFR Part 136. The quantitation level (QL) for naphthalene is 10 µg/L.

The MDL for tetrachloroethylene is 4.1 µg/L using gas chromatography/mass spectrometry and method number 624 from 40 CFR Part 136. The quantitation level (QL) for tetrachloroethylene is 10 µg/L.

These QLs will be used for assessment of compliance with these effluent limits. If the Permittee is unable to attain the MDL and QL in its effluent due to matrix effects, the Permittee shall submit a matrix specific MDL and QL to the Department by July 1, 1997. The matrix specific MDL and QL shall be calculated as follows:

MDL = 3.14 x (standard deviation of 7 replicate spiked samples). This corresponds to the calculation of the method detection limit, as defined in 40 CFR Part 136, Appendix B, with the provision that the MDL be calculated for a specific effluent matrix.

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 the Permittee's records. All check standard recovery data and duplicate measurements shall be submitted to the Department in the discharge monitoring report. The Department's precision goal is +/- 20 percent.

(4) If the measured effluent concentration is below the QL, the Permittee shall report NQ for non-quantifiable.

(5) Average values shall be calculated as follows: measurements below the MDL = 0; measurements greater than the MDL = the measurement.

(6) When sample measurements for compliance with mass-based limits fall below the MDL, the average loading shall be calculated using a concentration value of zero. When sample measurements for compliance with mass-based limits fall above the MDL, the average loading shall be calculated using the measured concentration.

**Figure 2** Flow—maximum daily

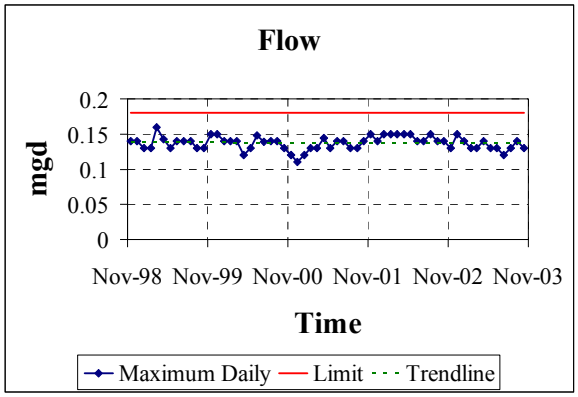



**Figure 3** pH—minimum and maximum daily

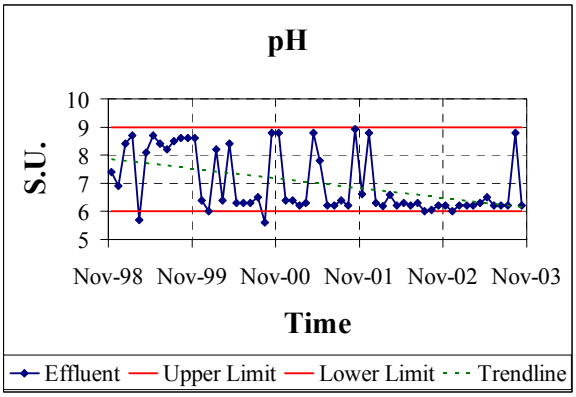



**Figure 4** Total suspended solids (TSS)—average monthly mass load

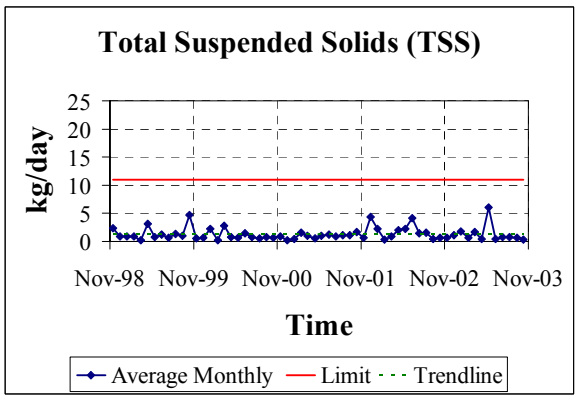



**Figure 5** Total suspended solids (TSS)—maximum daily mass load

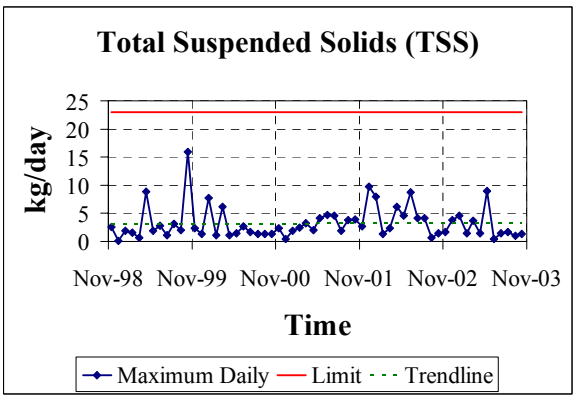


**Figure 6** Oil and Grease (O&G)—average monthly mass load

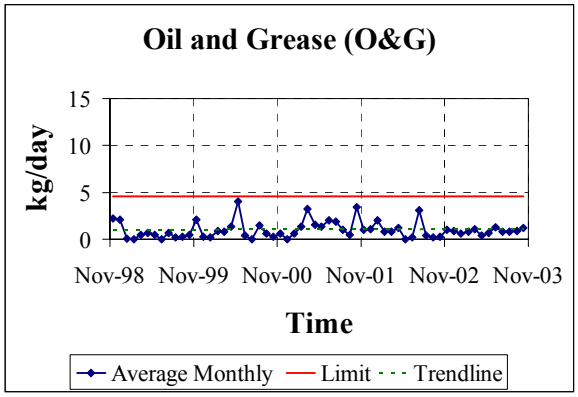



**Figure 7** Oil and Grease (O&G)—maximum daily mass load

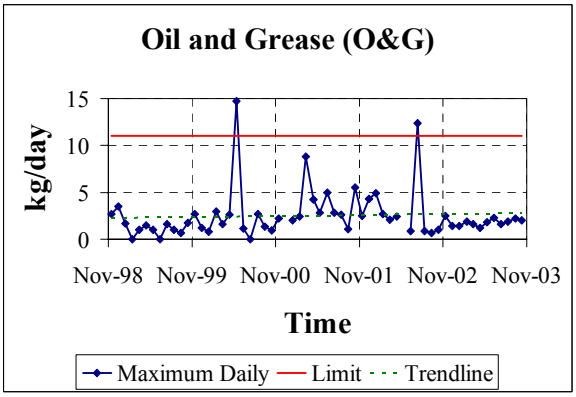



**Figure 8** Temperature—maximum daily

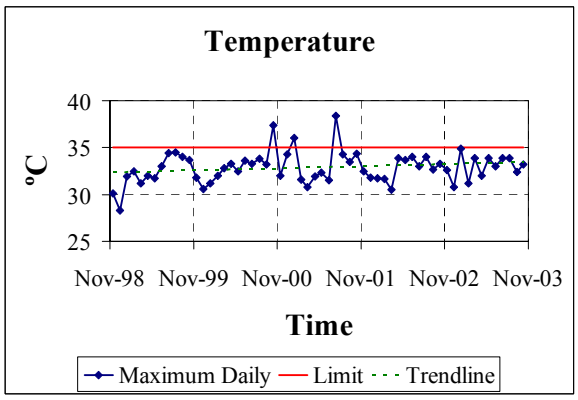



**Figure 9** Arsenic (As)—maximum daily concentration

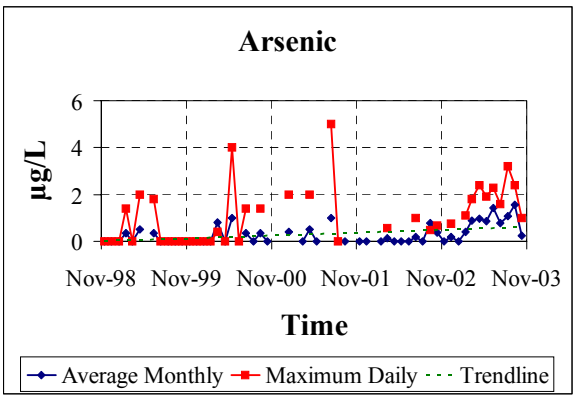



**Figure 10** Chromium (Cr) —average monthly mass load

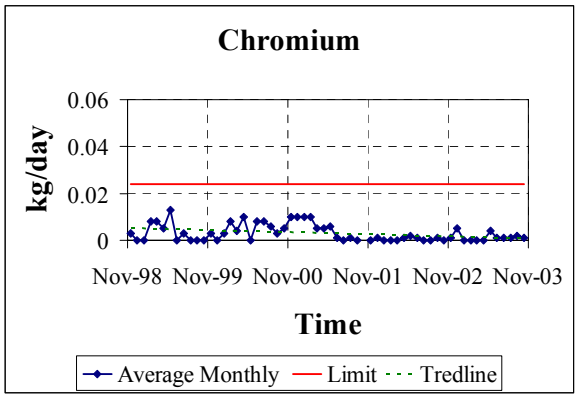



**Figure 11** Chromium (Cr)—maximum daily mass load

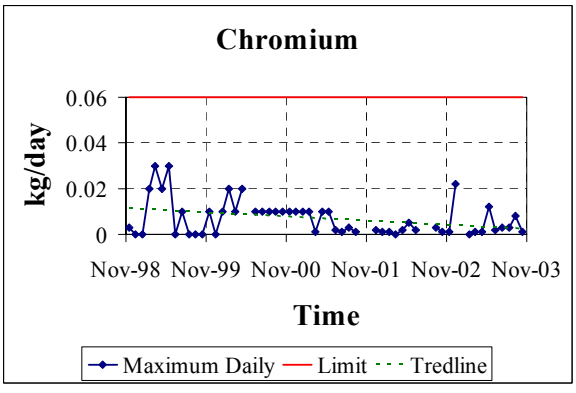


**Figure 12** Copper (Cu)—average monthly mass load

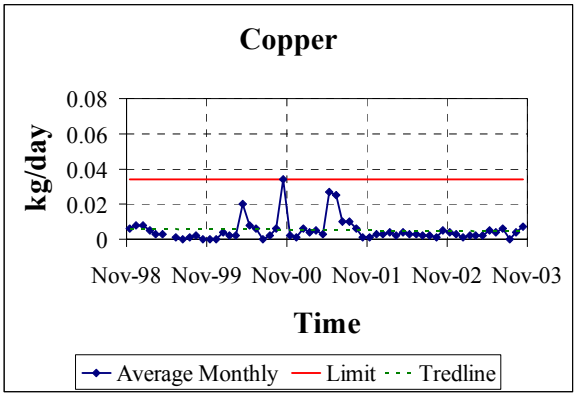



**Figure 13** Copper (Cu)—maximum daily mass load

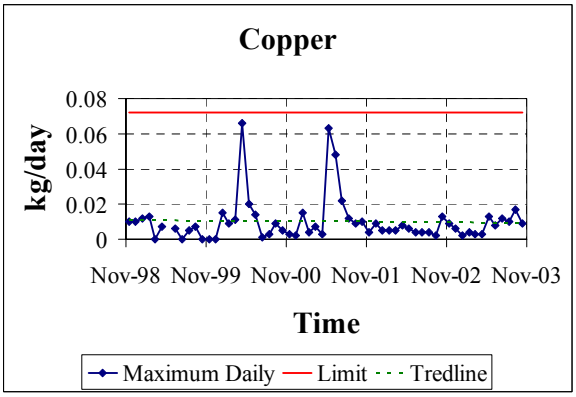



**Figure 14** Cyanide (CN)—average monthly mass load

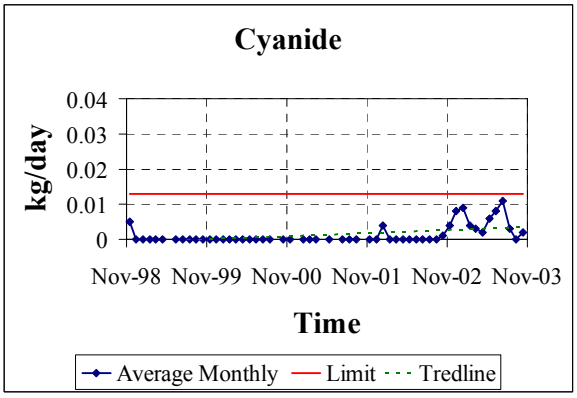



**Figure 15** Cyanide (CN)—maximum daily mass load

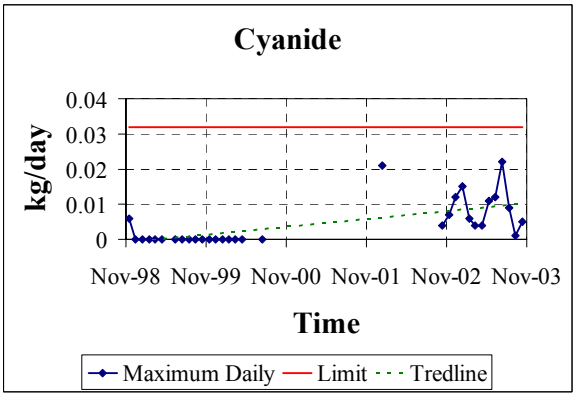



**Figure 16** Iron (Fe)—average monthly mass load

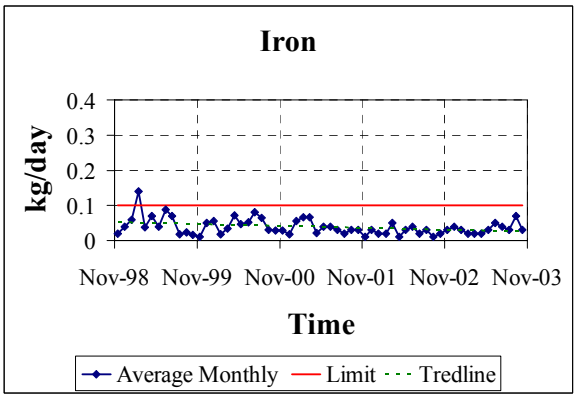



**Figure 17** Iron (Fe)—maximum daily mass load

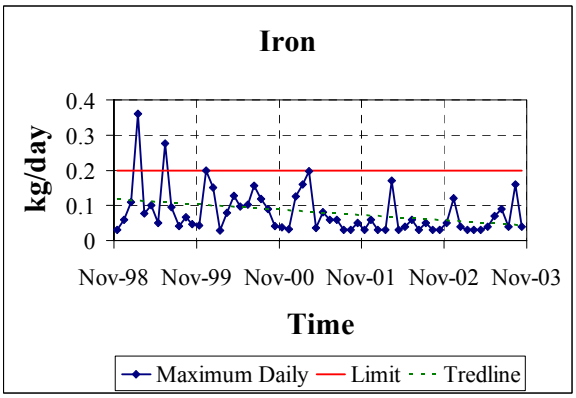


**Figure 18** Lead (Pb)—average monthly mass load

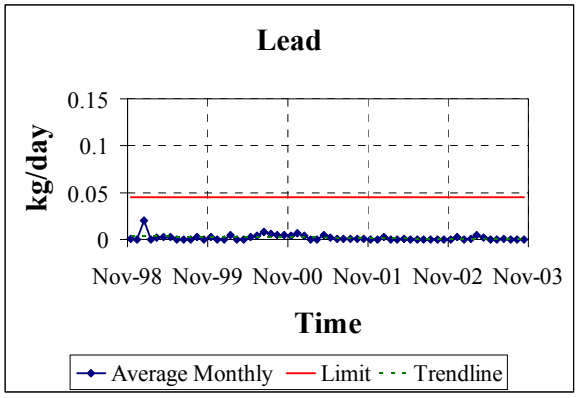



**Figure 19** Lead (Pb)—maximum daily mass load

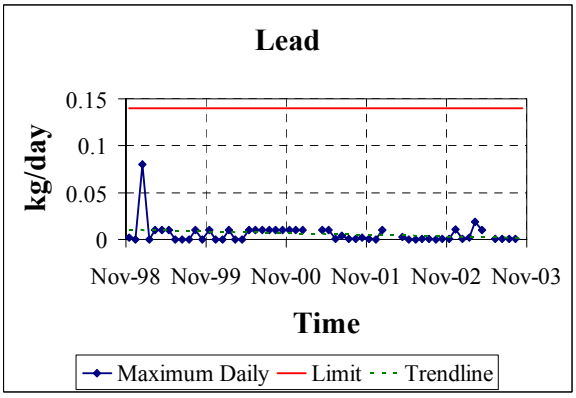



**Figure 20** Mercury (Hg)—average monthly mass load

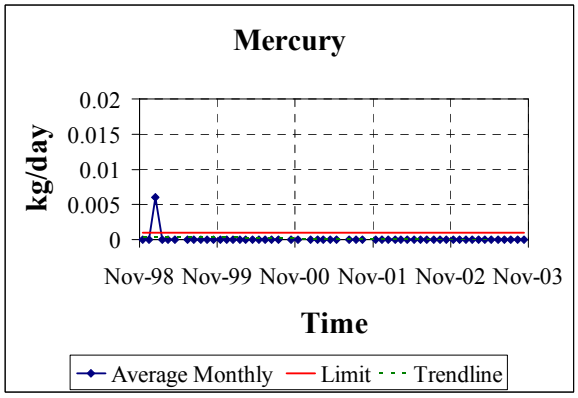



**Figure 21** Mercury (Hg)—maximum daily mass load

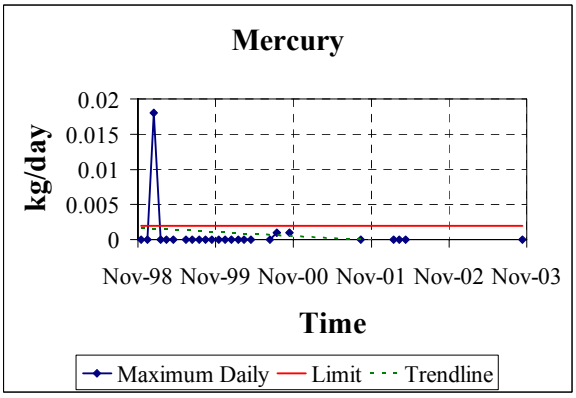



**Figure 22** Silver (Ag)—average monthly mass load

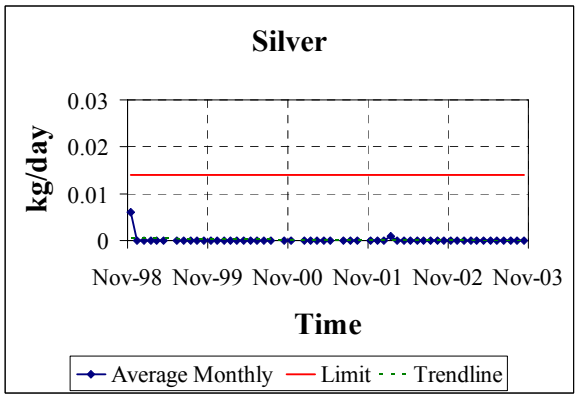



**Figure 23** Silver (Ag)—maximum daily mass load

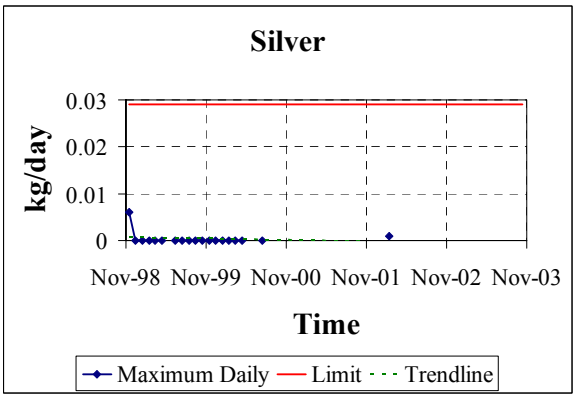


**Figure 24** Zinc (Zn)—average monthly mass load

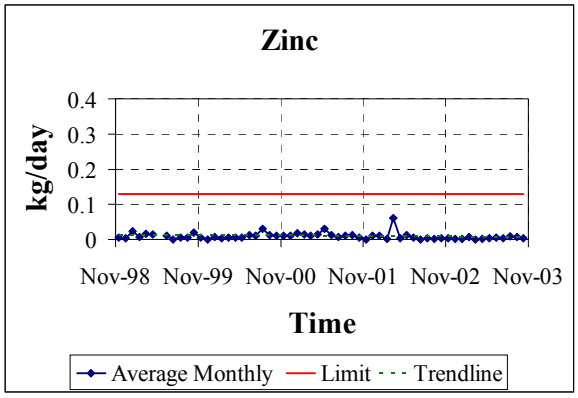



**Figure 25** Zinc (Zn)—maximum daily mass load

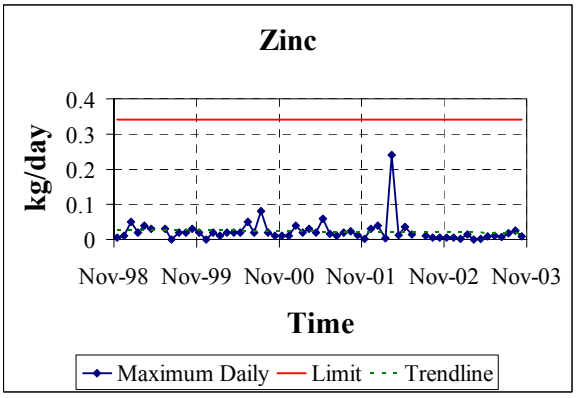



**Figure 26** **Naphthalene**—average monthly mass load

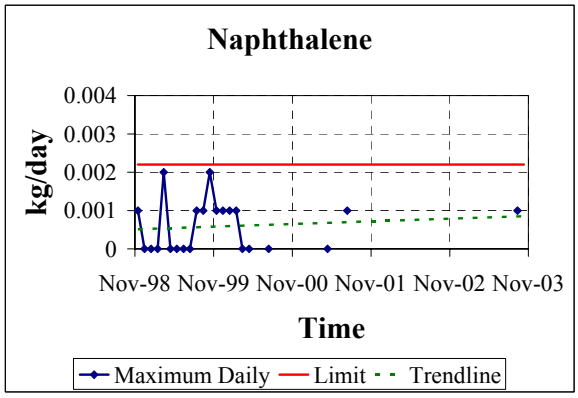
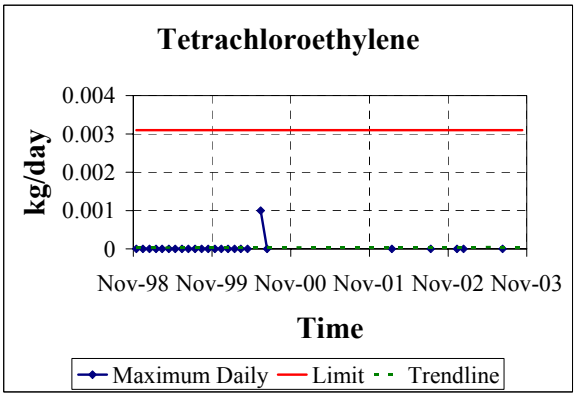



**Figure 27** **Tetrachloroethylene** —maximum daily mass load




## PROPOSED PERMIT LIMITATIONS

Federal and state regulations require that effluent limitations set forth in a NPDES permit must be either technology- or water quality-based. Technology-based limitations are based upon the treatment methods available to treat specific pollutants. Technology-based limitations are set by regulation or developed on a case-by-case basis (40 CFR 125.3, and Chapter 173-220 WAC). Water quality-based limitations are based upon compliance with the Surface Water Quality Standards (Chapter 173-201A WAC), Ground Water Standards (Chapter 173-200 WAC), Sediment Quality Standards (Chapter 173-204 WAC) or the National Toxics Rule (Federal Register, Volume 57, No. 246, Tuesday, December 22, 1992). The more stringent of these two limits must be chosen for each of the parameters of concern. Each of these types of limits is described in more detail below.

The limits in this permit are based in part on information received in the application. The effluent constituents in the application were evaluated on a technology- and water quality-basis. The limits necessary to meet the rules and regulations of the state of Washington were determined and included in this permit. The Department does not develop effluent limits for all pollutants that may be reported on the application as present in the effluent**.** Some pollutants are not treatable at the concentrations reported,

are not controllable at the source, are not listed in regulation, and do not have a reasonable potential to cause a water quality violation**.** Effluent limits are not always developed for pollutants that may be in the discharge but not reported as present in the application. In those circumstances the permit does not authorize discharge of the non-reported pollutants. Effluent discharge conditions may change from the conditions reported in the permit application. If significant changes occur in any constituent, as described in 40 CFR 122.42(a), the Permittee is required to notify the Department. The Permittee may be in violation of the permit until the permit is modified to reflect additional discharge of pollutants.

***DESIGN CRITERIA***

In accordance with WAC 173-220-150 (1)(g), flows or waste loadings shall not exceed approved design criteria.

The design criteria for this treatment facility are taken from updated December 2001 engineering report prepared by Raytheon Engineers and Constructors and are listed in *Table 4* and *Table 5*.

***TECHNOLOGY-BASED EFFLUENT LIMITATIONS***

The Pickle Line, Cold Rolling Mill, Metallic [Zinc] Coating Line, and the Paint Line all generate wastewater that must meet technology-based effluent limitations. Each production line is subject to a specific federal effluent limitation. All technology based limitations for the Steelscape facility are derived from the applicable New Source Performance Standards (NSPS), since the Steelscape facility was built after the standards were enacted. The federal effluent limitations are based on the amount of production from a particular process. With the exception of the fume scrubbers, the technology-based limitations that apply to the Steelscape facility are calculated by multiplying the federal limitation by the applicable production rate.

The following NSPSs were reviewed by the Department and found not applicable to the facility:

- ✓ 40 CFR 420.114(a) Alkaline cleaning subcategory— Steelscape has an alkaline cleaning section on the metallic [zinc] coating line that is presently not used. Because of the use of synthetic rolling oil on the cold mill line there is no need to use the alkaline cleaning section.

- ✓ 40 CFR 420.124(c) Hot coating subcategory—fume scrubbers; 40 CFR 420.124(c) does not apply because a process that requires a scrubber is operated less than two weeks a year (none between January 1, 2004, and August 18, 2004).

- ✓ 40 CFR 465.13 Coil coating[4], steel basis material subcategory; 40 CFR 465.13 does not apply to the wastewater discharges from the metallic coating line. The metallic coating line discharges waste waters resulting from the operations in which steel is coated with zinc by the hot dip process; therefore 40 CFR 420.124(a)(1) applies to the wastewater discharges from the metallic coating line.

The following is a list of applicable NSPSs:

[4]"Coil coating " means the process of converting basis material strip into coated stock. Usually cleaning, conversion coating, and painting are performed on the basis material. This regulation covers processes which perform any two or more of the three operations.

- ✓ Pickle Line; 40 CFR 420.94(b)(2) and 40 CFR 420.94(b)(4) are applicable including limitations for O&G [oil and grease] because acid pickling waste waters are treated with cold rolling waste waters.

- ✓ Cold Rolling Mill; 40 CFR 420.104(a)(1) is applicable including limitations for chromium and nickel in lieu of those for lead and zinc because cold rolling waste waters are co-treated with acid pickling waste waters.

- ✓ Metallic (Zinc) Coating Line; 40 CFR 420.124(a)(1) is applicable including limitations for hexavalent chromium because Steelscape has galvanizing operations which discharge wastewaters from the chromate rinse step.

- ✓ Coil Paint Line; 40 CFR 465.23

The following tables present the applicable federal effluent limitations and the resultant production-based effluent limitations for each of the production lines.

PICKLE LINE: 40 CFR PART 420 - SUBPART I - ACID PICKLING SUBCATEGORY

Wastewater discharges from the hydrochloric acid pickling line must meet the technology-based effluent limitations as specified in 40 CFR Part 420 - Iron and Steel Manufacturing Point Source Category. The pickle line processes maximum of 1,340 tonne per day and is subject to the effluent limitations listed in *Table 12*.

**Table 12: 40 CFR 420.94(b)(2) - Hydrochloric acid pickling effluent limitations (strip, sheet, and plate).**

| Pollutant | Maximum Daily (kg/t[5] of product) | Average Monthly (kg/t of product) | Maximum Daily (kg/day[6]) | Average Monthly (kg/day) |
|---|---|---|---|---|
| **Total Suspended Solids (TSS)** | 1.17E-02 | 5.01E-03 | 1.57E+01 | 6.71E+00 |
| **Oil and Grease (O&G)** | 5.01E-03 | 1.67E-03 | 6.71E+00 | 2.24E+00 |
| **Lead** | 7.51E-05 | 2.50E-05 | 1.01E-01 | 3.35E-02 |
| **Zinc** | 1.00E-04 | 3.34E-05 | 1.34E-01 | 4.48E-02 |
| **pH** | within the range of 6.0 to 9.0 at all times | | | |

Wastewater discharges from any fume scrubber that supports a hydrochloric acid pickling line must meet the technology-based effluent limitations as specified in 40 CFR Part 420 - Iron and Steel Manufacturing Point Source Category. The effluent limitations for wastewater from the single fume scrubber in the pickle line are subject to the effluent limitations in *Table 13*.

[5] Kilograms per ton

[6] Kilograms per day

**Table 13: 40 CFR 420.94(b)(4) - Fume Scrubbers.**

| Pollutant | Maximum Daily (kg/scrubber) | Average Monthly (kg/scrubber) | Maximum Daily (kg/day[7]) | Average Monthly (kg/day) |
|---|---|---|---|---|
| **TSS** | 5.72E+00 | 2.45E+00 | 5.72E+00 | 2.45E+00 |
| **O&G** | 2.45E+00 | 8.19E-01 | 2.45E+00 | 8.19E-01 |
| **Lead** | 3.68E-02 | 1.23E-02 | 3.68E-02 | 1.23E-02 |
| **Zinc** | 4.91E-02 | 1.64E-02 | 4.91E-02 | 1.64E-02 |
| **pH** | within the range of 6.0 to 9.0 at all times | | | |

COLD-ROLLING LINE: 40 CFR PART 420 - SUBPART J - COLD FORMING SUBCATEGORY

Wastewater discharges from the cold-rolling line must meet the technology-based effluent limitations as specified in 40 CFR Part 420 - Iron and Steel Manufacturing Point Source Category. The cold-rolling line processes a maximum of 1,308 tonne per day and is subject to the effluent limitations listed in *Table 14*.

**Table 14: 40 CFR 420.104(a)(1) - Cold-rolling mills. Recirculation -- single stand.**

| Pollutant | Maximum Daily (kg/t[8] of product) | Average Monthly (kg/t of product) | Maximum Daily (kg/day[9]) | Average Monthly (kg/day) |
|---|---|---|---|---|
| **TSS** | 1.25E-03 | 6.26E-04 | 1.63E+00 | 8.19E-01 |
| **O&G** | 5.22E-04 | 2.09E-04 | 6.83E-01 | 2.73E-01 |
| **Chromium** | 2.09E-05 | 8.40E-06 | 2.73E-02 | 1.10E-02 |
| **Nickel, total recoverable** | 1.88E-05 | 6.30E-06 | 2.46E-02 | 8.24E-03 |
| **Naphthalene** | 2.10E-06 | N/A | 2.75E-03 | N/A |
| **Tetrachloroethylene** | 3.10E-06 | N/A | 4.05E-03 | N/A |
| **pH** | within the range of 6.0 to 9.0 at all times | | | |

METALLIC [ZINC] COATING LINE: 40 CFR 420 - SUBPART L – HOT COATING SUBCATEGORY

Wastewater discharges from the metallic coating line must meet the technology-based effluent limitations as specified in 40 CFR Part 420 - Iron and Steel Manufacturing Point Source Category. The metallic coating line processes a maximum of 724 tone per day and is subject to the effluent limitations listed in *Table 15*.

[7] Kilograms per day

[8] Kilograms per ton

[9] Kilograms per day

**Table 15: 40 CFR 420.124(a)(1)- (a) Galvanizing, terne coating and other coatings—(1) Strip, sheet, and miscellaneous products.**

| Pollutant | Maximum Daily (kg/t of product) | Average Monthly (kg/t of product) | Maximum Daily (kg/day) | Average Monthly (kg/day) |
|---|---|---|---|---|
| **TSS** | 4.38E-02 | 1.88E-02 | 3.17E+01 | 1.36E+01 |
| **O&G** | 1.88E-02 | 6.26E-03 | 1.36E+01 | 4.53E+00 |
| **Lead** | 2.82E-04 | 9.39E-05 | 2.04E-01 | 6.79E-02 |
| **Zinc** | 3.76E-04 | 1.25E-04 | 2.72E-01 | 9.05E-02 |
| **Chromium +6** | 3.76E-05 | 1.25E-05 | 2.72E-02 | 9.05E-03 |
| **pH** | within the range of 6.0 to 9.0 at all times | | | |

PAINT LINE: 40 CFR PART 465 - SUBPART B - GALVANIZED BASIS MATERIAL SUBCATEGORY

Wastewater discharges from the paint line must meet the technology-based effluent limitations as specified in 40 CFR Part 465 - Coil Coating Point Source Category. The paint line processes an average of 74,000 $m^2$/day of coated steel strip and is subject to the effluent limitations listed in *Table 16*.

**Table 16: 40 CFR 465.23 - Coil coating, galvanized basis material subcategory.**

| Pollutant | Maximum Daily ($mg/m^2$ of product)[10] | Average Monthly ($mg/m^2$ of product) | Maximum Limit (kg/day[11]) | Average Monthly (kg/day) |
|---|---|---|---|---|
| **TSS** | 5.15E+00 | 4.12E+00 | 7.61E-01 | 6.09E-01 |
| **O&G** | 3.43E+00 | 3.43E+00 | 5.07E-01 | 5.07E-01 |
| **Chromium** | 1.30E-01 | 5.20E-02 | 1.92E-02 | 7.68E-03 |
| **Copper** | 4.40E-01 | 2.10E-01 | 6.50E-02 | 3.10E-02 |
| **Cyanide** | 7.00E-02 | 2.80E-02 | 1.03E-02 | 4.14E-03 |
| **Zinc** | 3.50E-01 | 1.50E-01 | 5.17E-02 | 2.22E-02 |
| **Iron** | 4.30E-01 | 2.20E-01 | 6.35E-02 | 3.25E-02 |
| **pH** | within the range of 7.5 to 10.0 at all times | | | |

COMBINED TECHNOLOGY-BASED EFFLUENT LIMITATIONS

*Table 12*, *Table 13*, *Table 14*, *Table 15*, and *Table 16* show the technology-based effluent limitations that apply to the individual production lines. Wastewater from the four production lines is combined and

[10] Milligrams per square meter of product

[11] Kilograms per day

treated in the industrial wastewater treatment plant. The effluent limitations that apply to the combined wastewater discharge are derived by summing the individual effluent limitations. *Table 17* gives the technology based effluent limitations for the combined industrial wastewater discharge. Limitations in µg/L[12] are calculated for the 0.180 mgd[13] flow.

**Table 17: Combined technology-based effluent limitations based .**

| Pollutant | Maximum Daily Limit | | Monthly Average Limit | |
|---|---|---|---|---|
| | kg/day[14] | µg/L | kg/day | µg/L |
| **Flow, millions of gallons per day (mgd)** | 1.80E-01 | | | |
| **pH** | within the range of 6.0 to 9.0 at all times | | | |
| **Total suspended solids (TSS)** | 5.55E+01 | 8.14E+04 | 2.42E+01 | 3.55E+04 |
| **Oil and grease (O&G)** | 2.40E+01 | 3.52E+04 | 8.37E+00 | 1.23E+04 |
| **Chromium, total recoverable** | 4.65E-02 | 6.83E+01 | 1.87E-02 | 2.74E+01 |
| **Hexavalent chromium, total recoverable** | 2.72E-02 | 3.99E+01 | 9.05E-03 | 1.33E+01 |
| **Copper, total recoverable** | 6.50E-02 | 9.54E+01 | 3.10E-02 | 4.55E+01 |
| **Cyanide** | 1.03E-02 | 1.52E+01 | 4.14E-03 | 6.07E+00 |
| **Iron, total recoverable** | 6.35E-02 | 9.32E+01 | 3.25E-02 | 4.77E+01 |
| **Lead, total recoverable** | 3.41E-01 | 5.01E+02 | 1.14E-01 | 1.67E+02 |
| **Nickel, total recoverable** | 2.46E-02 | 3.61E+01 | 8.24E-03 | 1.21E+01 |
| **Zinc, total recoverable** | 5.07E-01 | 7.44E+02 | 1.74E-01 | 2.55E+02 |
| **Naphthalene** | 2.75E-03 | 4.03E+00 | N/A | N/A |
| **Tetrachloroethylene** | 4.05E-03 | 5.95E+00 | N/A | N/A |

[12] Micrograms per liter

[13] Millions of gallons per day

[14] Kilograms per day

ARSENIC PERFORMANCE-BASED LIMITATIONS

The technology-based effluent limitations for arsenic (*Table 18*) are calculated based on Steelscape performance during most recent three years prior to drafting this permit.

**Table 18: Arsenic performance-based limitations**

| Pollutant | Maximum Daily Limit | Monthly Average Limit |
|---|---|---|
| | µg/L | |
| **Arsenic** | 4.8 | 2.4 |

OTHER TECHNOLOGY-BASED LIMITATIONS

The technology-based effluent limitation for temperature (*Table 19*) was established for the previous permit and is retained in this permit.

**Table 19: Other technology-based limitations**

| Pollutant | Maximum Daily Limit | Monthly Average Limit |
|---|---|---|
| | Degree Celsius (ºC) | |
| **Temperature** | 35 | N/A |

***SURFACE WATER QUALITY-BASED EFFLUENT LIMITATIONS***

In order to protect existing water quality and preserve the designated beneficial uses of Washington's surface waters, WAC 173-201A-060 states that waste discharge permits shall be conditioned such that the discharge will meet established Surface Water Quality Standards. The Washington State Surface Water Quality Standards (Chapter 173-201A WAC) is a state regulation designed to protect the beneficial uses of the surface waters of the state. Surface water quality-based effluent limitations may be based on an individual waste load allocation (WLA) or on a WLA developed during a basin wide total maximum daily loading study (TMDL).

NUMERICAL CRITERIA FOR THE PROTECTION OF AQUATIC LIFE

"Numerical" water quality criteria are numerical values set forth in the state of Washington's Water Quality Standards for Surface Waters (Chapter 173-201A WAC). They specify the levels of pollutants allowed in a receiving water while remaining protective of aquatic life. Numerical criteria set forth in the Water Quality Standards are used along with chemical and physical data for the wastewater and receiving water to derive the effluent limits in the discharge permit. When surface water quality-based limits are more stringent or potentially more stringent than technology-based limitations, they must be used in a permit.

NUMERICAL CRITERIA FOR THE PROTECTION OF HUMAN HEALTH

The U.S. EPA has promulgated 91 numeric water quality criteria for the protection of human health that are applicable to Washington State (EPA 1992). These criteria are designed to protect humans from

cancer and other disease and are primarily applicable to fish and shellfish consumption and drinking water from surface waters.

NARRATIVE CRITERIA

In addition to numerical criteria, "narrative" water quality criteria (WAC 173-201A-030) limit toxic, radioactive, or deleterious material concentrations below those which have the potential to adversely affect characteristic water uses, cause acute or chronic toxicity to biota, impair aesthetic values, or adversely affect human health. Narrative criteria protect the specific beneficial uses of all fresh (WAC 173-201A-130) and marine (WAC 173-201A-140) waters in the state of Washington.

ANTIDEGRADATION

The state of Washington's Antidegradation Policy requires that discharges into receiving water shall not further degrade the existing water quality of the water body. In cases where the natural conditions of receiving water are of lower quality than the criteria assigned, the natural conditions shall constitute the water quality criteria. Similarly, when the natural conditions of receiving water are of higher quality than the criteria assigned, the natural conditions shall be protected. More information on the State Antidegradation Policy can be obtained by referring to WAC 173-201A-070.

The Department has reviewed existing records and is unable to determine if ambient water quality is either higher or lower than the designated classification criteria given in Chapter 173-201A WAC; therefore, the Department will use the designated classification criteria for this water body in the proposed permit. The discharges authorized by this proposed permit should not cause a loss of beneficial uses.

CRITICAL CONDITIONS

Surface water quality-based limits are derived for the waterbody's critical condition, which represents the receiving water and waste discharge condition with the highest potential for adverse impact on the aquatic biota, human health, and existing or characteristic water body uses.

MIXING ZONES

The Water Quality Standards allow the Department to authorize mixing zones around a point of discharge in establishing surface water quality-based effluent limits. Both "acute" and "chronic" mixing zones may be authorized for pollutants that can have a toxic effect on the aquatic environment near the point of discharge. The concentration of pollutants at the boundary of these mixing zones may not exceed the numerical criteria for that type of zone. Mixing zones can only be authorized for discharges that are receiving all known, available, and reasonable methods of prevention, control and treatment (AKART) and in accordance with other mixing zone requirements of WAC 173-201A-100.

The National Toxics Rule (EPA, 1992) allows the chronic mixing zone to be used to meet human health criteria.

DESCRIPTION OF THE RECEIVING WATER

The facility discharges to Columbia River which is designated as a Class A receiving water in the vicinity of the outfall. Other nearby point source outfalls include Noveon Kalama and the City of Kalama sewage treatment plant. Characteristic uses include the following: water supply (domestic, industrial, agricultural); stock watering; fish migration; fish and shellfish rearing, spawning and harvesting; wildlife habitat; primary contact recreation; sport fishing; boating and aesthetic enjoyment; commerce and

navigation. Water quality of this class shall meet or exceed the requirements for all or substantially all uses.

A special condition for the Columbia River in the vicinity of the outfall is that the receiving water temperature shall not exceed 20°C due to human activities. This is above the Class A standard of 18°C. When natural conditions exceed 20.0°C, no temperature increase will be allowed which will raise the receiving water temperature by greater than 0.3°C; nor shall such temperature increases, at any time, exceed 0.3°C due to any single source.

SURFACE WATER QUALITY CRITERIA

Applicable criteria are defined in Chapter 173-201A WAC for aquatic biota. In addition, U.S. EPA has promulgated human health criteria for toxic pollutants (EPA 1992). The surface water quality criteria applicable to the combined discharge from Steelscape and the Port of Kalama are summarized below:

**Table 20: Surface Water Quality Criteria.**

| Parameter | Criteria |
|---|---|
| **Fecal Coliform** | 100 colonies/100 mL maximum geometric mean |
| **Dissolved Oxygen** | 8 mg/L minimum |
| **Temperature** | Shall not exceed 20.0°C due to human activities.<br>Note: Ambient temperature monitoring in the vicinity of the outfall has detected temperatures as high as 22.5°C. |
| **pH** | 6.5 to 8.5 standard units |
| **Turbidity** | Less than 5 NTU above background |
| **Toxics** | No toxics in toxic amounts (see Appendix C for numeric criteria for toxics of concern for this discharge)<br>Note: Ambient monitoring in the Columbia River has determined that arsenic is present at a concentration of 1 µg/L. This is above the human health standard of 0.018 µg/L, therefore, as is consistent with the state's policy, 1 µg/L will be the standard used to determine compliance with the human health standards. |

The Columbia River (WRIA[15] 27) is listed as impaired on the latest CWA[16] 303(d) list for the following parameters:

1. 4,4'-DDE (category 2[17]); Steelscape believes that 4,4'-DDE is absent and did not test for the pollutant; the permit requires Steelscape to test for 4,4'-DDE and submit the data with the permit renewal application

[15] Water Resource Inventory Area

[16] Clean Water Act

2. Ammonia-N (category 2); according to the permit application ammonia concentration in effluent is 4.4 milligrams per liter (mg/L); that's approximately on the level of the calculated acute water quality criteria and several times higher than the calculated chronic water quality criteria; the permit requires Steelscape to conduct receiving water and effluent study for ammonia, mixing zone study, AKART analysis for ammonia, and summarize findings in an engineering report

3. Arsenic, inorganic (category 2); performance-base limitations set in the permit

4. Bis(2-ethylehexyl) phthalate (category 2); Steelscape believes that bis(2-ethylehexyl) phthalate is absent; however Steelscape tested for the pollutant because testing was required; bis(2-ethylehexyl) phthalate was not found in one tested sample.

5. Dieldrin (category 5[18]); Steelscape believes that dieldrin is absent and did not test for the pollutant; the permit requires Steelscape to test for dieldrin and submit the data with the permit renewal application

6. Dioxin (category 4A[19]); Steelscape believes that dioxin is absent and did not test for the pollutant; the permit requires Steelscape to test for dioxin and submit the data with the permit renewal application

7. Total PCBs (category 5); Steelscape believes that PCBs are absent and did not test for PCBs; the permit requires Steelscape to test for total PCBs and submit the data with the permit renewal application

8. Temperature; the permit limit is based on an existing performance based limit and meets water quality criteria at the edge of chronic mixing zone

9. Total dissolved gas (category 4A); Steelscape is not a source that would contribute to the surface water quality criteria violation

The Columbia River TMDL[20] to assign waste load allocations for pollutants has not been done yet.

CONSIDERATION OF SURFACE WATER QUALITY-BASED LIMITS FOR NUMERIC CRITERIA

---

[17] Waters should be placed in Category 2 if there are data and information that meet the requirements of the State's assessment and listing methodology that support a determination that some, but not all, designated uses are attained and none are threatened. Attainment status of the remaining designated uses is unknown because data are insufficient to categorize water consistent with the State's listing methodology.

[18] This category constitutes the Section 303(d) list that EPA will approve or disapprove under the CWA. Waters should be placed in Category 5 when it is determined, in accordance with the State's assessment and listing methodology, that a pollutant has caused, is suspected of causing, or is projected to cause an impairment or threat. If that impairment or threat is due to a pollutant, the water should be placed in Category 5 and the pollutant causing the impairment identified. A water is considered impaired when one or more designated uses are not attained.

[19] Waters should only be placed in Category 4A when all TMDLs needed to result in attainment of all applicable WQSs have been approved or established by EPA. Once the TMDLs have been approved or established, the State should implement the TMDL as soon as practicable. Additionally, EPA encourages States to provide monitoring schedules for these waters to ensure that sufficient data are obtained to document progress of the implementation actions toward the attainment of WQSs, and that progress is reasonably consistent with the projected time of attainment included in the TMDL.

[20] Total Maximum Daily Load

Pollutant concentrations in the proposed discharge exceed water quality criteria with technology-based controls which the Department has determined to be AKART. A mixing zone was previously authorized by the Department. The mixing zone was authorized in accordance with the geometric configuration, flow restriction, and other restrictions for mixing zones in Chapter 173-201A WAC and are defined as follows:

The acute mixing zone will be to a maximum of 9.7 meters downstream of the diffuser. The chronic mixing zone will be a maximum of 97 meters downstream and 30 meters upstream of the diffuser.

The dilution factors of effluent to receiving water that occur within these zones have been determined at the critical condition by the use of the EPA computer program PLUMES. The dilution factors have been determined to be (Raytheon, 1996) and a listed in *Table 21*.

**Table 21: Dilution factors**

| | Acute | Chronic |
|---|---|---|
| **Aquatic Life** | 46 | 150 |
| **Human Health** | N/A | 150 |
| **Human Health; inorganic arsenic** | N/A | 1 |

The dilution factors were reviewed and approved by the Department before construction of facility was finished. The Department recognizes that revaluation of the factors is necessary and therefore the mixing zone study is required by the permit.

Pollutants in an effluent may affect the aquatic environment near the point of discharge (near field) or at a considerable distance from the point of discharge (far field). Toxic pollutants, for example, are near-field pollutants--their adverse effects diminish rapidly with mixing in the receiving water. Conversely, a pollutant such as BOD is a far-field pollutant whose adverse effect occurs away from the discharge even after dilution has occurred. Thus, the method of calculating surface water quality-based effluent limits varies with the point at which the pollutant has its maximum effect.

The derivation of surface water quality-based limits also takes into account the variability of the pollutant concentrations in both the effluent and the receiving water.

The critical condition for the Columbia River in the vicinity of the discharge is the seven-day average low river flow with a recurrence interval of ten years (7Q10). The receiving stream ambient data used for this permit includes the following from USGS data:

**Table 22: Ambient Data.**

| Parameter | Value used |
|---|---|
| **7Q10 low flow** | 2,300 $m^3/s$ |
| **Velocity** | 0.3 m/s and 0.1 m/s for acute and chronic respectively |
| **Depth** | 12.2 m |
| **Width** | 732 m |

| Parameter | Value used |
|---|---|
| **Temperature** | 22°C |
| **pH (high)** | 7.9 |
| **Total Ammonia-N** | 0.10 mg/L |
| **Hardness** | 46 mg/L as CaCO3 |
| **Arsenic (Total)** | 1.0 µg/L |
| **Copper** | 2.0 µg /L |
| **Iron** | 46 µg/L |
| **Zinc** | 2.0 µg /L |
| **All Other Metals** | 0.0 (below detection limits) |

The impacts of temperature, pH, ammonia, metals, and other toxics were determined as described below, using the dilution factors at critical conditions described above.

BOD[21]--This discharge with technology-based limitations results in a small amount of BOD loading relative to the large amount of dilution occurring in the receiving water at critical conditions. Technology-based limitations will be protective of dissolved oxygen criteria in the receiving water.

Temperature and pH--The impact of pH and temperature were modeled using the calculations from EPA, 1988. The input variables were dilution factor (chronic) of 150, upstream temperature 22.5°C, upstream pH 8.03, upstream alkalinity 46 (as mg CaCO3/L), effluent temperature 35°C, effluent pH of 6, effluent pH of 9, and effluent alkalinity 10 (as mg CaCO3/L).

Under critical conditions there is no predicted violation of the Water Quality Standards for Surface Waters. Therefore, the technology-based effluent limitations for temperature and pH are placed in the permit.

Turbidity-- Due to the large degree of dilution, it was anticipated that the turbidity criteria would not be violated outside the designated mixing zone.

Toxic Pollutants--Federal regulations (40 CFR 122.44) require NPDES permits to contain effluent limits for toxic chemicals in an effluent whenever there is a reasonable potential for those chemicals to exceed the surface water quality criteria. The process of evaluating reasonable potential occurs concurrently with the derivation of technology-based effluent limits. Facilities with technology-based effluent limits defined in regulation are not exempted from meeting the Water Quality Standards for Surface Waters or from having surface water quality-based effluent limits.

A determination of the discharge's potential to cause an exceedance of the water quality standards was conducted as required by 40 CFR 122.44(d). The reasonable potential determination was evaluated with procedures given in the Technical Support Document for Water Quality-Based Toxics Control

[21] Biochemical oxygen demand

(EPA/505/2-90-001) and the Department's Permit Writer's Manual (Ecology Publication 92-109, July, 1994).

The determination of the reasonable potential for parameters listed in *Table 23* and *Table 24*to exceed the water quality criteria was evaluated (see Appendix C) at the critical condition. The critical condition in this case occurs during the periods of low flow in the summer. The parameters used in the critical condition modeling are as follows: acute dilution factor of 46, chronic dilution factor of 150 and 1 for inorganic arsenic, and background concentration of pollutants listed in *Table 23* (aquatic life) and *Table 24* (human health).

**Table 23: Background concentration of pollutants used in the critical condition modeling (aquatic life)**

| Parameter | Ambient Concentration[22] |
|---|---|
| | µg/L[23] |
| **Aluminum, total recoverable** | 0[24] |
| **Ammonia, unionized** | 3.07E+01 |
| **Arsenic, dissolved** | 1.53E+00 |
| **Hexavalent chromium, dissolved** | 0[25] |
| **Trivalent chromium, dissolved** | 0[26] |
| **Copper, dissolved** | 1.29E+00 |
| **Cyanide** | 0[27] |
| **Iron, dissolved** | 8.00E+01[28] |
| **Lead, dissolved** | 7.06E-02 |
| **Mercury, dissolved** | 0[29] |
| **Nickel, dissolved** | 8.42E-01 |
| **Silver, dissolved** | 0[30] |
| **Zinc, dissolved** | 2.76E+00 |

[22] Calculated as a geometric mean of all detected values multiplied by 1.74 to estimate the 90th percentile for 1-20 data points.

[23] Micrograms per liter

[24] No valid ambient background data was available.

[25] No valid ambient background data was available.

[26] No valid ambient background data was available.

[27] No valid ambient background data was available.

[28] Background data obtained from the previous fact sheet with assumption that it represented dissolved iron.

[29] Not detected

[30] Not detected

| Parameter | Ambient Concentration[22] |
|---|---|
| | µg/L[23] |
| **Hardness** | 4.10E+04 |

**Table 24: Background concentration of pollutants used in the critical condition modeling (human health)**

| Parameter | Ambient Concentration[31] |
|---|---|
| | µg/L[32] |
| **Arsenic, inorganic** | 0[33] |
| **Bis(2 chloroisopropyl)ether** | 0[34] |
| **Cyanide** | 0[35] |
| **Iron, total recoverable** | 0[36] |
| **Mercury, total recoverable** | 0[37] |
| **Nickel, total recoverable** | 1.15E+00 |
| **Tetrachloroethylene** | 0[38] |

A determination of reasonable potential resulted in no reasonable potential for all parameters listed in *Table 23* and *Table 24* except inorganic arsenic. Since the reasonable potential determination indicated that the discharge has no reasonable potential to cause a violation of water quality standards, thus water quality-based effluent limitations are not warranted.

The Permittee is required in section 9 of the proposed permit to collect background concentrations near the point of discharge for all parameters limited in the permit plus ammonia. This information may result in a permit modification or modification of the permit limitations in the next renewal.

Water quality criteria for metals in Chapter 173-201A WAC are based on the dissolved fraction of the metal.

The Permittee may provide data clearly demonstrating the seasonal partitioning of the dissolved metal in the ambient water in relation to an effluent discharge. Metals criteria may be adjusted on a site-specific

[31] Calculated as a geometric mean of all detected values multiplied by 1.74 to estimate the 90th percentile for 1-20 data points.

[32] Micrograms per liter

[33] No valid ambient background data was available.

[34] No valid ambient background data was available.

[35] No valid ambient background data was available.

[36] No valid ambient background data was available.

[37] Not detected

[38] No valid ambient background data was available.

basis when data is available clearly demonstrating the seasonal partitioning in the ambient water in relation to an effluent discharge.

Metals criteria may also be adjusted using the water effects ratio approach established by USEPA, as generally guided by the procedures in USEPA Water Quality Standards Handbook, December 1983, as supplemented or replaced.

Water quality limits were calculated (see Appendix C) for comparison purposes for parameters listed in *Table 25*.

**Table 25: Surface water quality-based effluent limitations**

| PARAMETER | Aquatic life | Human health | Aquatic life | Human health |
|---|---|---|---|---|
| | Average Monthly Limit (AML) | | Maximum Daily Limit (MDL) | |
| | Micrograms per liter (µg/L) | | | |
| **Arsenic, total recoverable** | 8,220 | | 16,491 | |
| **Hexavalent chromium, total recoverable** | 350 | | 703 | |
| **Copper, total recoverable** | 140 | | 281 | |
| **Cyanide** | 504 | 105,000 | 1012 | 286,239 |
| **Iron, total recoverable** | 113,055 | 45,000 | 226,810 | 122,674 |
| **Lead, total recoverable** | 230 | | 461 | |
| **Mercury, total recoverable** | 2.0 | 21 | 3.0 | 52 |
| **Nickel, total recoverable** | 9,005 | 91,328 | 18,066 | 158,227 |
| **Silver, total recoverable** | 28 | | 40 | |
| **Zinc, total recoverable** | 1,176 | | 2,359 | |
| **Tetrachloroethylene** | | 120 | | 327 |
| **Aluminum, total recoverable** | 17,197 | | 34,500 | |
| **Ammonia, unionized** | 83,496 | | 167,508 | |
| **Arsenic, inorganic** | | 0.018 | | 0.018 |
| **Bis(2 chloroisopropyl)ether** | | 210,000 | | 306,351 |
| **Trivalent chromium, total recoverable** | 19,184 | | 38,486 | |

The following parameters are not evaluated beyond this point:

1. Mercury, total recoverable
2. Silver, total recoverable
3. Aluminum, total recoverable

4. Ammonia, unionized

5. Arsenic, total recoverable

6. Bis(2 chloroisopropyl)ether

7. Trivalent chromium, total recoverable

In 1992 the USEPA adopted risk-based arsenic criteria for the protection of human health for the state of Washington. The criterion for marine waters is 0.14 µg/L inorganic arsenic, and is based on exposure from fish and shellfish tissue ingestion. The freshwater criterion is 0.018 µg/L, and is based on exposure from fish and shellfish tissue and water ingestion. These criteria have caused confusion in implementation because they differ from the drinking water maximum contaminant level (MCL) of 50 µg/L, which is not risk-based, and because the human health criteria are sometimes exceeded by natural background concentrations of arsenic in surface water and ground water.

In Washington, when a natural background concentration exceeds the criterion, the natural background concentration becomes the criterion, and no dilution zone is allowed. This could result in a situation where natural groundwater or surface water used as a municipal or industrial source-water would need additional treatment to meet numeric effluent limits even though no arsenic was added as waste. Although this is not the case for all dischargers, we do not have data at this time to quantify the extent of the problem.

A regulatory mechanism to deal with the issues associated with natural background concentrations of arsenic in groundwater-derived drinking waters is currently lacking. Consequently, the Water Quality Program, at this time, has decided to use a three-pronged strategy to address the issues associated with the arsenic criteria. The three strategy elements are:

1. **Pursue, at the national level, a solution to the regulatory issue of groundwater sources with high arsenic concentrations causing municipal treatment plant effluent to exceed criteria.** The upcoming revision of the MCL for arsenic offers a national opportunity to discuss how drinking water sources can affect NPDES wastewater dischargers. This discussion should focus on developing a national policy for arsenic regulation that acknowledges the risks and costs associated with management of the public exposure to natural background concentrations of arsenic through water sources.

2. **Additional and more focused data collection**. The Water Quality Program will in some cases require additional and more focused arsenic data collection, will encourage or require dischargers to test for source water arsenic concentrations, and will pursue development of a proposal to have the Department's Environmental Assessment Program conduct drinking water source monitoring as well as some additional ambient monitoring data. At this time, Washington NPDES permits will contain numeric effluent limits for arsenic based only on treatment technology and aquatic life protection as appropriate.

3. **Data sharing**. The Department will share data with USEPA as they work to develop new risk-based criteria for arsenic and as they develop a strategy to regulate arsenic.

This permit sets performance based limits for inorganic arsenic.

WHOLE EFFLUENT TOXICITY

The Water Quality Standards for Surface Waters require that the effluent not cause toxic effects in the receiving waters. Many toxic pollutants cannot be detected by commonly available detection methods. However, toxicity can be measured directly by exposing living organisms to the wastewater in laboratory tests and measuring the response of the organisms. Toxicity tests measure the aggregate toxicity of the whole effluent, and therefore this approach is called whole effluent toxicity (WET) testing. Some WET tests measure acute toxicity and other WET tests measure chronic toxicity.

Acute toxicity tests measure mortality as the significant response to the toxicity of the effluent. Dischargers who monitor their wastewater with acute toxicity tests are providing an indication of the potential lethal effect of the effluent to organisms in the receiving environment.

Chronic toxicity tests measure various sub lethal toxic responses such as retarded growth or reduced reproduction. Chronic toxicity tests often involve either a complete life cycle test of an organism with an extremely short life cycle or a partial life cycle test on a critical stage of one of a test organism's life cycles. Organism survival is also measured in some chronic toxicity tests.

Accredited WET testing laboratories have the proper WET testing protocols, data requirements, and reporting format. Accredited laboratories are knowledgeable about WET testing and capable of calculating an NOEC, $LC_{50}$, $EC_{50,}$ IC25, etc. All accredited labs have been provided the most recent version of the Department of Ecology Publication # WQ-R-95-80, *Laboratory Guidance and Whole Effluent Toxicity Test Review Criteria* which is referenced in the permit. Any Permittee interested in receiving a copy of this publication may call the Department Publications Distribution Center (360) 407-7472 for a copy. The Department recommends that Permittees send a copy of the acute or chronic toxicity sections(s) of their permits to their laboratory of choice.

An effluent characterization for acute and chronic toxicity was conducted during the previous permit term (Appendix C). In accordance with WAC 173-205-060, the Permittee must repeat chronic effluent characterization for the following reason:

Chronic WET testing in February 2002[39] was not conducted on samples handled as required in WAC 173-205-080. The results of this WET testing cannot be used to characterize effluent toxicity or make the regulatory determination required in Chapter 173-205 WAC. Therefore, the Permittee is required to conduct another effluent characterization for chronic whole effluent toxicity.

Acute toxicity was measured during effluent characterization in the previous permit term (Appendix C). Acute toxicity was found to be at levels that, in accordance with WAC 173-205-050(2)(a), have a reasonable potential to cause receiving water toxicity. An acute toxicity limit is therefore required. The acute toxicity limit is no statistically significant difference in test organism survival between the acute critical effluent concentration (ACEC), 2.2 percent of the effluent, and the control.

The acute toxicity limit is set relative to the zone of acute criteria exceedance (acute mixing zone) established in accordance with WAC 173-201A-100. The acute critical effluent concentration (ACEC) is the concentration of effluent existing at the boundary of the acute mixing zone during critical conditions.

[39] Steelscape might have had chronic toxicity at 2.2% effluent in February 2002, but the ACEC was not included in the test. The NOEC was 1.6% effluent in this test and the LOEC was 3.7% effluent. It is impossible to know if 2.2% effluent would have been toxic when 3.7% was toxic and 1.6% wasn't toxic.

Monitoring for compliance with an acute toxicity limit is accomplished by conducting an acute toxicity test using a sample of effluent diluted to equal the ACEC, 2.2 percent of the effluent, and comparing test organism survival in the ACEC to survival in nontoxic control water. The Permittee is in compliance with the acute toxicity limit if there is no statistically significant difference in test organism survival between the ACEC and the control.

Steelscape was ranked #4 (Washington State Department of Ecology, 1994). The ranking requires the Permittee to characterize effluent for acute toxicity quarterly and for chronic toxicity semiannually (Appendix C). Monitoring shall be conducted using each of the species listed below on a rotating basis:

- One fish
- One invertebrate

HUMAN HEALTH

Washington's water quality standards now include 91 numeric health-based criteria that must be considered in NPDES permits. These criteria were promulgated for the state by the U.S. EPA in its National Toxics Rule (Federal Register, Volume 57, No. 246, Tuesday, December 22, 1992).

The Department has determined that the effluent is likely to have chemicals of concern for human health. The chemicals of concern for human health are listed in *Table 24*. The discharger's high priority status is based on the following:

1. The discharger's status as a major discharger,

2. Knowledge of data or process information indicating regulated chemicals occur in the discharge, and

3. The applicant discharges to a waterbody that is 303(d) listed for a regulated chemical, and that chemical is known or expected to be in the effluent.

A determination of the discharge's potential to cause an exceedance of the water quality standards was conducted as required by 40 CFR 122.44(d). The reasonable potential determination was evaluated with procedures given in the Technical Support Document for Water Quality-Based Toxics Control (EPA/505/2-90-001) and the Department's Permit Writer's Manual (Ecology Publication 92-109, July, 1994). The determination indicated that the discharge has no reasonable potential to cause a violation of water quality standards, thus effluent limitations based on human health health-based criteria are not warranted. However, the limitations were calculated for comparison purposes and they are listed in *Table 25*. None of them became the permit limitation.

SEDIMENT QUALITY

The Department has promulgated aquatic sediment standards (Chapter 173-204 WAC) to protect aquatic biota and human health. These standards state that the Department may require Permittees to evaluate the potential for the discharge to cause a violation of applicable standards (WAC 173-204-400).

The Department has determined, for the previous permit, through a review of the discharger characteristics and effluent characteristics that this discharge has no reasonable potential to violate the Sediment Management Standards.

***GROUND WATER QUALITY LIMITATIONS***

The Department has promulgated Ground Water Quality Standards (Chapter 173-200 WAC) to protect beneficial uses of ground water. Permits issued by the Department shall be conditioned in such a manner so as not to allow violations of those standards (WAC 173-200-100).

Steelscape applied to discharge an average of 29,000 gallons per day (gpd) of wastewater as a dust suppressant over 24 acres of their site. Currently Steelscape applies City of Kalama water as a dust suppressant.

The Department believes the discharge of wastewater as a dust suppressant has the potential to cause a violation of the Ground Water Quality Standards and therefore the Department imposes the following conditions in the proposed permit:

1. Steelscape may discharge wastewater at an average of 1500 gpd as a dust suppressant from June through September as long as the total discharge does not exceed 183,000 gallons for an application season. Steelscape would not be subject to the requirements of the ground water quality standards but the following conditions should apply:

   a. the volume of the discharge should be measured, recorded and reported

   b. the discharge should be applied uniformly over 24 acres

   c. chloride and TDS concentrations in the wastewater should be determined monthly during times of discharge

2. If Steelscape wants to discharge wastewater to ground at higher rates than 1500 gpd or greater than 183,000 gallons per year, they will need to provide site-specific hydrogeologic information that demonstrates that the discharge will be in compliance with the Washington State's ground water quality standards (Chapter 173-200 WAC).

Bases for the above conditions is explained in details in Appendix E.

***COMPARISON OF EFFLUENT LIMITS WITH THE EXISTING PERMIT ISSUED SEPTEMBER 14, 1998***

**Table 26: Comparison of effluent limits with the existing permit**

| PARAMETER | Existing Limits | | Proposed Limits | | | |
|---|---|---|---|---|---|---|
| | Average Monthly Limit (AML) | Maximum Daily Limit (MDL) | Units[40] | Average Monthly Limit (AML) | Maximum Daily Limit (MDL) | Limit Origin |
| | kg/day[41] | | | | | |
| **Flow, millions of gallons per day (mgd)** | ---- | 0.18 | mgd | N/A | 0.18 | Existing from the engineering report |

[40] Units in this column are for values in two columns to the right from the units column.

[41] In kilograms per day unless otherwise defined in the parameter column.

| PARAMETER | Existing Limits | | Proposed Limits | | | |
|---|---|---|---|---|---|---|
| | Average Monthly Limit (AML) | Maximum Daily Limit (MDL) | Units[40] | Average Monthly Limit (AML) | Maximum Daily Limit (MDL) | Limit Origin |
| | kg/day[41] | | | | | |
| **pH, S.U.**[42] | Between 6.0 and 9.0 | | S.U. | Within the range of 6.0 to 9.0 | | Existing, 40 CFR |
| **Total suspended solids (TSS)** | 11 | 23 | kg/day | 11 | 23 | Existing, 40 CFR |
| **Oil and grease (O&G)** | 4.6 | 11 | kg/day | 4.6 | 11 | Existing, 40 CFR |
| **Temperature, ºC**[43] | ---- | 35 | ºC | N/A | 35 | Existing, water quality-based |
| **Arsenic, total recoverable** | N/A | N/A | µg/L | 2.4 | 4.8 | New, performance-based |
| **Chromium, total recoverable** | 0.024 | 0.060 | kg/day | 0.019 | 0.047 | Changed, 40 CFR |
| **Hexavalent chromium, total recoverable** | N/A | N/A | kg/day | 0.0090 | 0.027 | New, 40 CFR |
| **Copper, total recoverable** | 0.034 | 0.072 | kg/day | 0.031 | 0.065 | Changed, 40 CFR |
| **Cyanide** | 0.013 | 0.032 | kg/day | 0.004 | 0.010 | Changed, 40 CFR |
| **Iron, total recoverable** | 0.10 | 0.20 | kg/day | 0.03 | 0.06 | Changed, 40 CFR |
| **Lead, total recoverable** | 0.045 | 0.14 | kg/day | 0.045 | 0.14 | Existing, 40 CFR |
| **Mercury, total recoverable** | 0.0010 | 0.0020 | µg/L | None | None | Removed, no reasonable potential |
| **Nickel, total recoverable** | N/A | N/A | kg/day | 0.0082 | 0.025 | New, 40 CFR |
| **Silver, total recoverable** | 0.014 | 0.029 | µg/L | None | None | Removed, no reasonable potential |
| **Zinc, total recoverable** | 0.13 | 0.34 | kg/day | 0.13 | 0.34 | Existing, 40 CFR |
| **Naphthalene** | ---- | 0.0022 | kg/day | N/A | 0.0022 | Existing, 40 CFR |

[42] Standard units

[43] Degree Celsius

| PARAMETER | Existing Limits | | Proposed Limits | | | |
|---|---|---|---|---|---|---|
| | Average Monthly Limit (AML) | Maximum Daily Limit (MDL) | Units[40] | Average Monthly Limit (AML) | Maximum Daily Limit (MDL) | Limit Origin |
| | kg/day[41] | | | | | |
| **Tetrachloroethylene** | ---- | 0.0031 | kg/day | N/A | 0.0031 | Existing, 40 CFR |

## MONITORING REQUIREMENTS

Monitoring, recording, and reporting are required (WAC 173-220-210 and 40 CFR 122.41) to verify that the treatment process is functioning correctly and the effluent limitations are being achieved.

The monitoring schedule is detailed in the proposed permit under Condition S.1. Specified monitoring frequencies take into account the quantity and variability of the discharge, the treatment method, past compliance, significance of pollutants, and cost of monitoring. The monitoring frequencies of parameters required to be monitored by the existing permit are retained in this permit.

### *EFFLUENT LIMITS BELOW QUANTITATION*

The Quantitation Level (QL) is the level at which concentrations can be reliably reported with a specified level of error. For maximum daily effluent limits, if the measured effluent concentration is below the QL, the Permittee reports NQ for non-quantifiable in addition to the QL numerical value. For average monthly effluent limits, all effluent concentrations below the Quantitation Level but above the Method Detection Level are used as reported for calculating the average monthly value.

### *EFFLUENT LIMITS BELOW DETECTION*

The Method Detection Level (MDL) is the minimum concentration of an analyte that can be measured and reported with a 99 percent confidence that it's concentration is greater than zero as determined by a specific laboratory method. For maximum daily limits, if the concentrations are below the MDL the Permittee reports ND for non-detectable in addition to the MDL numerical value. For average monthly limits, all values above the MDL are used as reported and all values below the MDL are calculated as zero.

### *LAB ACCREDITATION*

With the exception of certain parameters the permit requires all monitoring data to be prepared by a laboratory registered or accredited under the provisions of Chapter 173-50 WAC, *Accreditation of Environmental Laboratories.*

## OTHER PERMIT CONDITIONS

### *REPORTING AND RECORDKEEPING*

The conditions of S2 are based on the authority to specify any appropriate reporting and recordkeeping requirements to prevent and control waste discharges (WAC 173-220-210).

***NON-ROUTINE AND UNANTICIPATED DISCHARGES***

Occasionally, this facility may generate wastewater which is not characterized in their permit application because it is not a routine discharge and was not anticipated at the time of application. These typically are waters used to pressure test storage tanks or fire water systems or leaks from drinking water systems. These are typically clean waste waters but may be contaminated with pollutants. The permit contains an authorization for non-routine and unanticipated discharges. The permit requires a characterization of these waste waters for pollutants and examination of the opportunities for reuse. Depending on the nature and extent of pollutants in this wastewater and opportunities for reuse, the Department may authorize a direct discharge via the process wastewater outfall or through a stormwater outfall for clean water, require the wastewater to be placed through the facilities wastewater treatment process or require the water to be reused.

***SPILL PLAN***

The Department has determined that the Permittee stores a quantity of chemicals that have the potential to cause water pollution if accidentally released. The Department has the authority to require the Permittee to develop best management plans to prevent this accidental release under section 402(a)(1) of the Federal Water Pollution Control Act (FWPCA) and RCW 90.48.080.

The Permittee has developed a plan for preventing the accidental release of pollutants to state waters and for minimizing damages if such a spill occurs. The proposed permit requires the Permittee to review and update the Spill Plan, as needed, at least annually. Changes to the plan shall be sent to the Department.

***SOLID WASTE PLAN***

The Department has determined that the Permittee has a potential to cause pollution of the waters of the state from leachate of solid waste.

This proposed permit requires, under the authority of RCW 90.48.080, that the Permittee update, if necessary, the solid waste plan designed to prevent solid waste from causing pollution of the waters of the state. The plan must be submitted to the local permitting agency for approval, if necessary, and to the Department.

***EFFLUENT MIXING STUDY***

The Department has estimated the amount of mixing of the discharge within the authorized mixing zone to determine the potential for violations of the Water Quality Standards for Surface Waters (Chapter 173-201A WAC). Condition S7 of this permit requires the Permittee to more accurately determine the mixing characteristics of the discharge. Mixing will be measured or modeled under conditions specified in the permit to assess whether assumptions made about dilution will protect the receiving water quality outside the allotted dilution zone boundary.

***OUTFALL EVALUATION***

Proposed permit Condition S11 requires the Permittee to conduct an outfall inspection and submit a report detailing the findings of that inspection. The purpose of the inspection is to determine the condition of the discharge pipe and diffusers and to evaluate the extent of sediment accumulations in the vicinity of the outfall.

### *TREATMENT SYSTEM OPERATING PLAN*

In accordance with state and federal regulations, the Permittee is required to take all reasonable steps to properly operate and maintain the treatment system (40 CFR 122.41(e)) and WAC 173-220-150 (1)(g). An operation and maintenance manual is required by state regulation for the construction of wastewater treatment facilities (WAC 173-240-150). It has been determined that the implementation of the procedures in the Treatment System Operating Plan is a reasonable measure to ensure compliance with the terms and limitations in the permit.

### *GENERAL CONDITIONS*

General Conditions are based directly on state and federal law and regulations and have been standardized for all individual industrial NPDES permits issued by the Department.

## PERMIT ISSUANCE PROCEDURES

### *PERMIT MODIFICATIONS*

The Department may modify this permit to impose numerical limitations, if necessary to meet Water Quality Standards for Surface Waters, Sediment Quality Standards, or Water Quality Standards for Ground Waters, based on new information obtained from sources such as inspections, effluent monitoring, outfall studies, and effluent mixing studies.

The Department may also modify this permit as a result of new or amended state or federal regulations.

### *RECOMMENDATION FOR PERMIT ISSUANCE*

This proposed permit meets all statutory requirements for authorizing a wastewater discharge, including those limitations and conditions believed necessary to control toxics, protect human health, aquatic life, and the beneficial uses of waters of the state of Washington. The Department proposes that this proposed permit be issued according to the Columbia Gorge Basin (Basin 5) schedule with expiration day of June 30, 2008.

## REFERENCES FOR TEXT AND APPENDICES

Environmental Protection Agency (EPA)

1992. National Toxics Rule. Federal Register, V. 57, No. 246, Tuesday, December 22, 1992.

1991. Technical Support Document for Water Quality-based Toxics Control. EPA/505/2-90-001.

1988. Technical Guidance on Supplementary Stream Design Conditions for Steady State Modeling. USEPA Office of Water, Washington, D.C.

1985. Water Quality Assessment: A Screening Procedure for Toxic and Conventional Pollutants in Surface and Ground Water. EPA/600/6-85/002a.

1983. Water Quality Standards Handbook. USEPA Office of Water, Washington, D.C.

Raytheon Engineers and Constructors, Philadelphia, Pennsylvania

1996. Engineering Report for Industrial Wastewater Treatment Facility. Prepared for BHP Coated Steel Corporation, Kalama, Washington; approved by the Department on April 19, 1996; updated by Steelscape on December 2001 and August 2004

Tsivoglou, E.C., and J.R. Wallace.

1972. Characterization of Stream Reaeration Capacity. EPA-R3-72-012. (Cited in EPA 1985 op.cit.)

Washington State Department of Ecology.

1994. Permit Writer's Manual. Publication Number 92-109

Washington State Department of Ecology.

Laws and Regulations( http://www.ecy.wa.gov/laws-rules/index.html )

Permit and Wastewater Related Information
(http://www.ecy.wa.gov/programs/wq/wastewater/index.html

Wright, R.M., and A.J. McDonnell.

1979. In-stream Deoxygenation Rate Prediction. Journal Environmental Engineering Division, ASCE. 105(EE2). (Cited in EPA 1985 op.cit.)

## APPENDIX A--PUBLIC INVOLVEMENT INFORMATION

The Department has tentatively determined to reissue a permit to the applicant listed on page 1 of this fact sheet. The permit contains conditions and effluent limitations which are described in the rest of this fact sheet.

Public notice of application was published on May 15, 2004, and May 23, 2004, in *The Daily News* to inform the public that an application had been submitted and to invite comment on the reissuance of this permit.

The Department will publish a Public Notice of Draft (PNOD) on _____ ,in *The Daily News* to inform the public that a draft permit and fact sheet are available for review. Interested persons are invited to submit written comments regarding the draft permit. The draft permit, fact sheet, and related documents are available for inspection and copying between the hours of 8:00 a.m. and 5:00 p.m. weekdays, by appointment, at the regional office listed below. Written comments should be mailed to:

Industrial Unit Permit Coordinator
Department of Ecology
Southwest Region - Water Quality
P.O. Box 47775
Olympia, WA 98504-7775

Any interested party may comment on the draft permit or request a public hearing on this draft permit within the 30-day comment period to the address above. The request for a hearing shall indicate the interest of the party and reasons why the hearing is warranted. The Department will hold a hearing if it determines there is a significant public interest in the draft permit (WAC 173-220-090). Public notice regarding any hearing will be circulated at least 30 days in advance of the hearing. People expressing an interest in this permit will be mailed an individual notice of hearing (WAC 173-220-100).

Comments should reference specific text followed by proposed modification or concern when possible. Comments may address technical issues, accuracy and completeness of information, the scope of the facility's proposed coverage, adequacy of environmental protection, permit conditions, or any other concern that would result from issuance of this permit.

The Department will consider all comments received within 30 days from the date of public notice of draft indicated above, in formulating a final determination to issue, revise, or deny the permit. The Department's response to all significant comments is available upon request and will be mailed directly to people expressing an interest in this permit.

Further information may be obtained from the Department by telephone, (360) 407-6280, or by writing to the address listed above.

This permit and fact sheet were written by Jacek Anuszewski, P.E.

## APPENDIX B--GLOSSARY

**Acute Toxicity**--The lethal effect of a compound on an organism that occurs in a short period of time, usually 48 to 96 hours.

**AKART**-- An acronym for "all known, available, and reasonable methods of treatment".

**Ambient Water Quality**--The existing environmental condition of the water in a receiving water body.

**Ammonia**--Ammonia is produced by the breakdown of nitrogenous materials in wastewater. Ammonia is toxic to aquatic organisms, exerts an oxygen demand, and contributes to eutrophication. It also increases the amount of chlorine needed to disinfect wastewater.

**Average Monthly Discharge Limitation** --The average of the measured values obtained over a calendar month's time.

**Best Management Practices (BMPs)**--Schedules of activities, prohibitions of practices, maintenance procedures, and other physical, structural and/or managerial practices to prevent or reduce the pollution of waters of the State. BMPs include treatment systems, operating procedures, and practices to control: plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage. BMPs may be further categorized as operational, source control, erosion and sediment control, and treatment BMPs.

**$BOD_5$**--Determining the Biochemical Oxygen Demand of an effluent is an indirect way of measuring the quantity of organic material present in an effluent that is utilized by bacteria. The $BOD_5$ is used in modeling to measure the reduction of dissolved oxygen in a receiving water after effluent is discharged. Stress caused by reduced dissolved oxygen levels makes organisms less competitive and less able to sustain their species in the aquatic environment. Although BOD is not a specific compound, it is defined as a conventional pollutant under the federal Clean Water Act.

**Bypass**--The intentional diversion of waste streams from any portion of a treatment facility.

**Chlorine**--Chlorine is used to disinfect wastewaters of pathogens harmful to human health. It is also extremely toxic to aquatic life.

**Chronic Toxicity**--The effect of a compound on an organism over a relatively long time, often 1/10 of an organism's lifespan or more. Chronic toxicity can measure survival, reproduction or growth rates, or other parameters to measure the toxic effects of a compound or combination of compounds.

**Clean Water Act (CWA)**--The Federal Water Pollution Control Act enacted by Public Law 92-500, as amended by Public Laws 95-217, 95-576, 96-483, 97-117; USC 1251 et seq.

**Compliance Inspection - Without Sampling**--A site visit for the purpose of determining the compliance of a facility with the terms and conditions of its permit or with applicable statutes and regulations.

**Compliance Inspection - With Sampling**--A site visit to accomplish the purpose of a Compliance Inspection - Without Sampling and as a minimum, sampling and analysis for all parameters with limits in the permit to ascertain compliance with those limits; and, for municipal facilities, sampling of influent to ascertain compliance with the 85 percent removal requirement. Additional sampling may be conducted.

**Composite Sample**--A mixture of grab samples collected at the same sampling point at different times, formed either by continuous sampling or by mixing discrete samples. May be "time-composite"(collected at constant time intervals) or "flow-proportional" (collected either as a constant sample volume at time intervals proportional to stream flow, or collected by increasing the volume of each aliquot as the flow increased while maintaining a constant time interval between the aliquots.

**Construction Activity**--Clearing, grading, excavation and any other activity which disturbs the surface of the land. Such activities may include road building, construction of residential houses, office buildings, or industrial buildings, and demolition activity.

**Continuous Monitoring** –Uninterrupted, unless otherwise noted in the permit.

**Critical Condition**--The time during which the combination of receiving water and waste discharge conditions have the highest potential for causing toxicity in the receiving water environment. This situation usually occurs when the flow within a water body is low, thus, its ability to dilute effluent is reduced.

**Dilution Factor**--A measure of the amount of mixing of effluent and receiving water that occurs at the boundary of the mixing zone. Expressed as the inverse of the percent effluent fraction e.g., a dilution factor of 10 means the effluent comprises 10% by volume and the receiving water 90%.

**Engineering Report**--A document which thoroughly examines the engineering and administrative aspects of a particular domestic or industrial wastewater facility. The report shall contain the appropriate information required in WAC 173-240-060 or 173-240-130.

**Fecal Coliform Bacteria**--Fecal coliform bacteria are used as indicators of pathogenic bacteria in the effluent that are harmful to humans. Pathogenic bacteria in wastewater discharges are controlled by disinfecting the wastewater. The presence of high numbers of fecal coliform bacteria in a water body can indicate the recent release of untreated wastewater and/or the presence of animal feces.

**Grab Sample**--A single sample or measurement taken at a specific time or over as short period of time as is feasible.

**Industrial Wastewater**--Water or liquid-carried waste from industrial or commercial processes, as distinct from domestic wastewater. These wastes may result from any process or activity of industry, manufacture, trade or business, from the development of any natural resource, or from animal operations such as feed lots, poultry houses, or dairies. The term includes contaminated storm water and, also, leachate from solid waste facilities.

**Major Facility--**A facility discharging to surface water with an EPA rating score of $> 80$ points based on such factors as flow volume, toxic pollutant potential, and public health impact.

**Maximum Daily Discharge Limitation**--The highest allowable daily discharge of a pollutant measured during a calendar day or any 24-hour period that reasonably represents the calendar day for purposes of sampling. The daily discharge is calculated as the average measurement of the pollutant over the day.

**Method Detection Level (MDL)--**The minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is above zero and is determined from analysis of a sample in a given matrix containing the analyte.

**Minor Facility--**A facility discharging to surface water with an EPA rating score of < 80 points based on such factors as flow volume, toxic pollutant potential, and public health impact.

**Mixing Zone**--An area that surrounds an effluent discharge within which water quality criteria may be exceeded. The area of the authorized mixing zone is specified in a facility's permit and follows procedures outlined in state regulations (Chapter 173-201A WAC).

**National Pollutant Discharge Elimination System (NPDES)**--The NPDES (Section 402 of the Clean Water Act) is the Federal wastewater permitting system for discharges to navigable waters of the United States. Many states, including the State of Washington, have been delegated the authority to issue these permits. NPDES permits issued by Washington State permit writers are joint NPDES/State permits issued under both State and Federal laws.

**pH**--The pH of a liquid measures its acidity or alkalinity. A pH of 7 is defined as neutral, and large variations above or below this value are considered harmful to most aquatic life.

**Quantitation Level (QL)--** A calculated value five times the MDL (method detection level).

**Responsible Corporate Officer**-- A president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy- or decision-making functions for the corporation, or the manager of one or more manufacturing, production, or operating facilities employing more than 250 persons or have gross annual sales or expenditures exceeding $25 million (in second quarter 1980 dollars), if authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures (40 CFR 122.22).

**Technology-based Effluent Limit**--A permit limit that is based on the ability of a treatment method to reduce the pollutant.

**Total Suspended Solids (TSS)**--Total suspended solids is the particulate material in an effluent. Large quantities of TSS discharged to a receiving water may result in solids accumulation. Apart from any toxic effects attributable to substances leached out by water, suspended solids may kill fish, shellfish, and other aquatic organisms by causing abrasive injuries and by clogging the gills and respiratory passages of various aquatic fauna. Indirectly, suspended solids can screen out light and can promote and maintain the development of noxious conditions through oxygen depletion.

**State Waters**--Lakes, rivers, ponds, streams, inland waters, underground waters, salt waters, and all other surface waters and watercourses within the jurisdiction of the state of Washington.

**Stormwater**--That portion of precipitation that does not naturally percolate into the ground or evaporate, but flows via overland flow, interflow, pipes, and other features of a storm water drainage system into a defined surface water body, or a constructed infiltration facility.

**Upset**--An exceptional incident in which there is unintentional and temporary noncompliance with technology-based permit effluent limitations because of factors beyond the reasonable control of the Permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, lack of preventative maintenance, or careless or improper operation.

**Water Quality-based Effluent Limit**--A limit on the concentration of an effluent parameter that is intended to prevent the concentration of that parameter from exceeding its water quality criterion after it is discharged into a receiving water.

## APPENDIX C--TECHNICAL CALCULATIONS

Several of the Excel® spreadsheet tools used to evaluate a discharger's ability to meet Washington State water quality standards can be found on the Department's homepage at http://www.ecy.wa.gov.

All calculations of permit limits are in a spreadsheet named *application_data.xls*. The spreadsheet is available upon request from:

Industrial Unit Permit Coordinator
Department of Ecology
Southwest Region - Water Quality
P.O. Box 47775
Olympia, WA 98504-7775

## APPENDIX D--RESPONSE TO COMMENTS

## APPENDIX E-- TECHNICAL MEMORANDUM

WASHINGTON STATE DEPARTMENT OF ECOLOGY
Water Quality Program
Southwest Regional Office

Technical Memorandum

January 28, 2004

To: Jacek Anuszewski, Permit Manager

From: Denis Erickson, Hydrogeologist

Subject: Steelscape Inc. Permit Application, NPDES Permit No. WA004085 - Request to Use Wastewater for Dust Suppressant

At your request I reviewed the Steelscape permit application regarding their proposal to discharge an average of 29,000 gallons per day (gpd) of wastewater as a dust suppressant over 24 acres of their site. Currently Steelscape applies City of Kalama water as a dust suppressant. This memorandum is my response to your request.

**Wastewater Quality**

Three analyses of the wastewater are included in the permit application. Based on these analyses the constituents of concern in the effluent are total dissolved solids (TDS) and chloride. The average concentrations and ground water quality standard criteria for the constituents of concern are listed in Table 1.

**Table 1. Constituents of Concern, Concentrations and Criteria.**

| Sampling Date / Parameter | Effluent Sample 1 11/3/98 | Effluent Sample 2 8/8/00 | Effluent Sample 3 8/14/01 | Average Concentration | Ground Water Quality Criteria |
|---|---|---|---|---|---|
| Chloride | 980 | 1400 | 860 | 1080 | 250 |
| Total Dissolved Solids | 1900 | 2300 | 1448 | 1883 | 500 |

Note: Concentrations in mg/L.

The average concentrations for chloride and TDS concentrations are 1080 mg/L and 1883 mg/L, respectively, however the samples show considerable variation, and there is some concern about the representative ness of these average values. As you will see later in this memorandum I rely fairly heavily on these average values to evaluate the potential for ground water contamination.

The permit application does not describe the site hydrogeology or soil conditions at the facility and there is no evaluation of the potential effects of the discharge on ground water quality.

To understand the site hydrogeologic conditions, at least in a general way, and to evaluate the susceptibility of the site to ground water contamination I reviewed the following:

- the soil survey for the Cowlitz survey
- regional geologic reports for the area, and
- well logs for wells in the site vicinity in Ecology Well Log Database (Ecology, 2003).

These sources are readily available on the Department's website and as GIS coverages. The site conditions are summarized below.

**Geology, Soils, and Hydrogeology**

The site is underlain by floodplain alluvial deposits of the Columbia River that consist of sand, gravel and silt (Meyers, 1970 and Walsh, et al, 1987). The soils consist mostly of silt loam and silty clay loam (Call, 1970). All soils are subject to seasonal high water tables of 1 to 3 feet below the ground surface. A well log for two resource protection wells drilled on the "BHP Steel" site to a depth of 20 feet showed 18 feet of sand overlying two feet of silt. The water level was not recorded on the log. One generalized log for 20 cone penetrometer tests at the "BHP" site encountered sand and silty sand to 90 feet with an organic silt and clay layer at a depth interval of 9 to 19 feet. The regional water table was logged at a depth of 13 feet and water perched about the organic silt and clay layer at a depth of seven feet. Two wells near the facility were test wells drilled by the Port of Kalama to depths of 67 and 101.5 feet. The wells encountered sand and silty sand with occasional silt layers. Generally below a depth of 50 feet the material consisted of fine-medium and coarse sand. The water level in the 67-foot well was about 23 feet but was not recorded for the 101.5-foot well.

Regional ground-water flow beneath the site is likely toward the Columbia River. The local flow pattern in the uppermost water-bearing zone will be influenced by discharge activities at the ground surface and infiltration variability and may be complex. Because of the flat-lying topography the hydraulic gradient is likely to be low.

**Estimated Effects on Ground Water Quality**

Based on hydrogeologic conditions at the site, the proposed discharge of wastewater will likely affect ground water quality. To estimate this effect I used a water balance model combined with a simple mass balance model. The water balance model estimates the amount of recharge to ground water. For this model, evapotranspiration was estimated using the method by Thornthwaite and Mather (1957) and Palmer and Havens (1958) using normal monthly temperature data for the City of Kalama. The monthly recharge was estimated using the method described by Fenn (1985). The amount of runoff from the site was assumed to be negligible. The climatological data and estimated ground water recharge rate are summarized as follows:

| | |
|---|---|
| Annual Precipitation | 56.3[44] inches |
| Annual Evapotranspiration | 25.9 inches |
| Annual Estimated Recharge | 30.4 inches |

The mass balance model is used to calculate an average ground water concentration for selected loading rates and site-specific aquifer conditions. The basic characteristics of this model are described in the

[44] 45.7 inches

Appendix[45] VIII in the Permit Writers Manual. I modified the model so that the water component of the wastewater did not contribute to the concentration calculation. This is based on the assumption that the water component of the wastewater being applied as a dust suppressant under dry conditions would be evaporated and not infiltrated. I also modified the model to account for seasonal applications. The original model assumed annual loading only.

Other model assumptions are listed as follows:

- Wastewater is applied uniformly over 24 acres
- Infiltrated water and ground water mix instantaneously
- Contaminants were not attenuated by sorption or losses from biodegradation or volatilization
- Hydrodynamic dispersion and diffusion are disregarded.

Assumed aquifer properties are listed as follows:

- Hydraulic Conductivity 3 feet/day
- Hydraulic Gradient 0.0020 feet/feet
- Aquifer and Depth of Mixing Thickness 20 feet
- Porosity 0.30
- Site width perpendicular to ground-water flow 1600 feet
- Background concentration for TDS 100 mg/L
- Background concentration for chloride 10 mg/L

In my opinion, these input values are fairly conservative for the site conditions. The estimated concentrations for chloride and TDS for three discharge scenarios are shown in Table 2.

**Table 2. Estimated Chloride and TDS Concentrations for Three Discharge Scenarios.**

| Discharge Scenarios | Discharge (gpd) | Number of Discharge Days | Chloride Estimated Aquifer Concentration (mg/L) | Total Dissolved Solids Estimated Aquifer Concentration (mg/L) |
|---|---|---|---|---|
| Background (Assumed) | ---- | ---- | 10 | 100 |
| 1. Steelscape Permit Request | 29000 | 365 | 562 | 1006 |
| 2. Steelscape Summer Discharge Only | 29000 | 122 | 188 | 336 |
| 3. Steelscape Summer Discharge Only | 1500 | 122 | 10 | 20 |

From Table 2, an annual discharge of 29,000 gpd would exceed ground water quality criteria for both chloride and TDS (Scenario 1). The estimated average concentration in ground water is 562 mg/L for chloride and 1006 mg/L for TDS, over two times the ground water quality criteria. This discharge would violate the ground water quality standards (Chapter 173-200) and is not allowable.

**Ground Water Quality Standards**

[45] Chapter

The goal of the ground water quality standards is to maintain a high quality of ground water and to protect existing and future beneficial uses. This goal is achieved by three mechanisms:

1. AKART- all known, available and reasonable methods of prevention, control and treatment
2. An antidegradation policy which mandates the protection of background water quality and prevents degradation of ground water quality that would harm beneficial use.
3. Numerical and narrative standards.

Assuming that AKART has been achieved for the wastewater, the mechanism to establish enforcement limits under the antidegradation policy is to determine background concentrations for the constituents of concern. This requires a ground water monitoring program. The process to define enforcement limits is described in the Implementation Guidance for Ground Water Quality Standards (Ecology, 1996). Basically, we must know background concentrations before we can determine ground water limits.

**Additional Discharge Scenarios**

It seems unlikely that dust suppression would be needed at the facility on a year round basis as requested by the Steelscape. Most likely the discharge would only be needed during the summer. The estimated effects of discharging 29,000 gpd of wastewater from June through September, 122 days, are shown in scenario 2 in Table 2. Again the estimated concentrations in ground water for chloride (188 mg/L) and TDS (336 mg/L) are much greater than assumed background levels. However, as shown in Scenario 3, if the discharge to ground is about 1500 gpd during June through September, the chloride concentration is equal to the assumed background level. Because chloride is the limiting water quality parameter, the TDS concentration is reduced to below the background level.

**Conclusions**

1. The Steelscape site is underlain by alluvial deposits consisting mostly of sand and silty sand with a shallow water table. The uppermost aquifer is susceptible to contamination from surface activities.

2. The constituents of concern in the wastewater are chloride and TDS with average concentrations of 1080 mg/L and 1883 mg/L, respectively. These averages are based on three samples that show considerable variation and additional testing should be considered to provide a better estimate of the average.

3. The proposed discharge of 29,000 gpd to ground as a dust suppressant would exceed the ground water quality criteria for chloride and TDS and is not allowable under the ground water quality standards (Chapter 173-200 WAC).

4. Steelscape may discharge wastewater an average of 1500 gpd as a dust suppressant from June through September as long as the total discharge does not exceed 183,000 gallons for an application season. Steelscape would not be subject to the requirements of the ground water quality standards but the following conditions should apply:

    - the volume of the discharge should be measured, recorded and reported
    - the discharge should be applied uniformly over 24 acres
    - chloride and TDS concentrations in the wastewater should be determined monthly during times of discharge

5. If Steelscape wants to discharge wastewater to ground at higher rates than 1500 gpd or greater than 183,000 gallons per year, they will need to provide site-specific hydrogeologic information that demonstrates that the discharge will be in compliance with the Washington State's ground water quality standards (Chapter 173-200 WAC).

**References**

Call, W.A., 1974. Soil Survey of the Cowlitz Area, Washington. US Department of Agriculture Soil Conservation Service. 112p +maps

Ecology, 1990. Water Quality Standards for Ground Waters of the State of Washington, Chapter 173-200 WAC. 8p.

Ecology, 1996. Implementation Guidance for the Ground Water Quality Standards, Ecology publication #96-02, http//www.ecy.wa.gov/pubs/96002.pdf.

Ecology, 1999. Permit Writer's Manual, Appendix VIII, July 1999

Ecology Well Log Home Page, 2003. November 19, 2003

Fenn, D.G. et al., 1975. Use of the Water Balance Method for Predicting Leachate Generation from Solid Waste Disposal Sites. US EPA/530/SW-168. 40p.

Myers, D.A., 1970. Availability of Ground Water in Western Cowlitz County, Washington. Washington Department of Ecology Water-Supply Bulletin No.35.
63 p.

Palmer, W.C. and A.V. Havens, 1958. A Graphical Technique for Determining Evapotranspiration by the Thornthwaite Method. Monthly Weather Review, pp. 123-128.

Walsh, T.J., M.A. Korosec, W.M. Phillips, R.L. Logan, H.W. Schasse, 1987. Geologic Map of Washington -- Southwest Quadrant. Division of Geology and Earth Resources Geologic Map GM-34.

Thornthwaite, C.W. and J.R. Mather, 1957. Instructions and Tables for Computing Potential Evapotranspiration and the Water Balance. Drexel Institute of Technology, Publications in Climatology, Volume X, Number 3.