

**FACT SHEET FOR NPDES PERMIT WA-004558-6**  
**LEHIGH CEMENT COMPANY**

**SUMMARY**

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## 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 of permits (NPDES 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 RCW defines the Department of Ecology's authority and obligations in administering the wastewater discharge permit program.

The regulations adopted by the State include procedures for issuing permits (Chapter 173-220 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 thirty 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.

<b>GENERAL INFORMATION</b>	
Applicant	Lehigh Cement Company
Facility Name and Address	Closed Cement Kiln Dust Pile Milepost 14.7 Washington State Route 31 Metaline Falls, Washington 99153
Type of Facility:	Closed Cement Kiln Dust Pile
SIC Code	Not Applicable
Discharge Location	Sullivan Creek Latitude: 48° 51' 40" N                      Longitude: 117° 22' 0" W.
Water Body ID Number	WA 62-SN79HL

## **BACKGROUND INFORMATION**

### *DESCRIPTION OF THE FACILITY*

#### **HISTORY**

From 1914 to 1989, Lehigh operated a cement plant in Meteline Falls, Washington. The plant utilized a dry processing kiln as part of the production process. The resulting kiln gases were routed through the plant's dust collection systems. Cement kiln dust (CKD), a by-product of Portland cement production, was produced and collected from the Lehigh plant. The CKD was transported from the dust collection systems to a ravine across Quarry Road, east of the plant. Approximately 544,000 tons of CKD were placed in the ravine to form the CKD landfill. Lehigh sold the cement production plant and specific land holdings to Lafarge Corporation in 1989. Lehigh retained ownership of the CKD landfill. In 1996, Lehigh capped the CKD Pile and installed other closure systems in accordance with an Ecology-approved Closure Plan. CKD-affected groundwater downgradient of the pile has persisted following closure of the CKD Pile. Since closure of the CKD Pile, Lehigh has conducted several groundwater investigations, and installed a pilot scale in situ treatment system.

#### **INDUSTRIAL PROCESS**

Contaminated groundwater will be captured by a subsurface hydraulic barrier wall and routed toward a groundwater treatment system. The subsurface hydraulic barrier will be located downgradient of the Closed CKD Pile in the Sullivan Creek floodplain. A gravel drainage layer located immediately upgradient and within the interior of the barrier wall would provide a higher permeability flow path for groundwater as it enters the funnel. The groundwater treatment system will consist of a treatment corridor that would consist of a series of permeable treatment zones. The treatment zones would contain perforated plastic pipes encasing silicone tubing. The tubing would be used to diffuse carbon dioxide into groundwater, resulting in carbonic acid production. The carbonic acid would neutralize the high pH water, which in turn would reduce the soluble arsenic concentrations in groundwater. The complexes formed by the pH adjustment would precipitate in the soil matrix. Based on computer modeling, the precipitates will remain stable. The treated groundwater would eventually discharge to Sullivan Creek in accordance with the NPDES permit.

#### **DISCHARGE OUTFALL**

The treated groundwater is discharged to Sullivan Creek along about 90 feet of streambank. The discharge will be continuous at about 0.1 to 0.2 cubic feet per second (cfs). The flow will fluctuate due to seasonal and temporal variations.

#### *PERMIT STATUS*

This is a new, previously unpermitted facility.

*SUMMARY OF COMPLIANCE WITH THE PERMIT ISSUED*

The facility does not currently have a permit.

*WASTEWATER CHARACTERIZATION*

The estimated influent concentrations and masses for the proposed wastewater discharge are based on groundwater data collected since June 1999. Table 1 includes estimates of potential maximum daily values that are based on data collected from on-site groundwater monitoring wells. The full list of parameters included in Part V of the application will not be necessary to include for the effluent discharge since background groundwater concentrations are equivalent or higher in some cases to the treated groundwater collected immediately downgradient of the pilot treatment system. The influent was characterized for the following regulated parameters:

**Table 1: Wastewater Characterization**

Parameter	Maximum Daily
Flow	130,000 gallons/day
Ammonia as N	0.46 mg/l
Arsenic	0.275 mg/l
BOD	2.3 mg/l
Chromium	0.010 mg/l
COD	49 mg/l
Iron	5.2 mg/l
Lead	0.200 mg/l
Magnesium	26 mg/l
Manganese	3.5 mg/l
pH	12.8 s.u.
Phosphorous total	0.11 mg/l
Sulfate	52 mg/l
Temperature (summer)	19.8 degrees C
Temperature (winter)	3.8 degrees C
TOC	14 mg/l
TSS	60 mg/l

### *SEPA COMPLIANCE*

Lehigh Cement Company prepared a SEPA checklist for the cleanup action at the Closed CKD Pile. Ecology issued a determination of non-significance (DNS) for the remedial action. The DNS determination was finalized after public comment on February 24, 2006.

### **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 (40 CFR 131.36). 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. Ecology 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 of Ecology. The Permittee may be in violation of the permit until the permit is modified to reflect additional discharge of pollutants.

### *TECHNOLOGY-BASED EFFLUENT LIMITATIONS*

The technology-based effluent limitations are set at the groundwater cleanup levels for the Site. Following an applicable or relevant and appropriate requirements (ARARs) analysis, Site specific Method B cleanup levels were developed and calculated from formulas provided in WAC 173-340-720 through WAC 173-340-760. Groundwater cleanup levels set under Method B for groundwater must be at least as stringent as the criteria in WAC 173-340-720(4)(b). Cleanup levels were established for arsenic, chromium, lead, manganese, and pH. Since treated groundwater at the Site will discharge to Sullivan Creek, groundwater cleanup levels are set to be protective of drinking water and surface water. For arsenic, the most stringent of these concentrations is the National Toxics Rule (NTR) 40 CFR 131 surface water concentration of 0.018 micrograms per liter (ug/L). However, this concentration is less than the natural background concentration of arsenic for the state of Washington. When a cleanup level is less than a natural background level, the cleanup level is established at a concentration equal to the natural background concentration, WAC 173-340-700(6)(d). Therefore, the groundwater cleanup level for arsenic for protection of surface water and drinking water will be 5 ug/L.

Chromium has a cleanup level of 10 ug/L, which is based on the National Toxics Rule (NTR) 40 CFR 131 and WAC 173-201A for a chronic exposure to aquatic life. This chromium concentration is based on the assumption that hexavalent chromium is present in the total chromium results. WAC 173-201A also establishes the Site cleanup level for lead at 1.85 ug/L. Similar to arsenic, this concentration is less than the natural background concentration for lead in the state of Washington. The cleanup level for lead will be set at the established background concentration of 5 ug/L. The manganese cleanup level will be established using the Method B cleanup level for non-carcinogenic contaminants, which sets the manganese concentration at 2,240 ug/l for protection of human health.

The pH cleanup level for the Site is based by reference on the water quality criteria set forth under WAC 173-201A. The surface water criteria establish a cleanup level range of 6.5 to 8.5 standard units. Each of the cleanup levels, and therefore, effluent limits are based on AKART.

#### *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 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 a receiving water shall not further degrade the existing water quality of the water body. In cases where the natural conditions of a 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 a 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 water body'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

A permit can authorize an acute and a chronic mixing zone around the point of discharge as allowed by Chapter 173-201A WAC, *Water Quality Standards for Surface Waters of the State of Washington*. The Water Quality Standards stipulate some criteria be met before a mixing zone is allowed. At this time a mixing zone, a mixing zone will not be granted. After a two-year treatment system optimization, Ecology will consider a mixing zone dependent on system performance.

#### DESCRIPTION OF THE RECEIVING WATER

The facility discharges to Sullivan Creek which is designated as freshwater Class AA receiving water in the vicinity of the outfall. The headwaters of Sullivan Creek begin as an outlet for Sullivan Lake and flows are regulated by Sullivan Dam. The Washington Department of Fish and Wildlife has established a minimum flow for Sullivan Creek below Mill Pond Dam. The minimum flows are set for the months of October through March at 75 cubic feet per second (cfs). These minimum flows are critical for fish egg incubation.

Sullivan Creek joins the Pend Oreille River approximately 1,700 feet to the west downstream from the Site. The Pend Oreille River, one of the major sub-basins of the Columbia River, drains headwater basins in Montana and Idaho and flows through the northeast corner of Washington. The Pend Oreille River joins the Columbia River in southern British Columbia. The Pend

Oreille River watershed is comprised of nineteen sub-basins and drains an area of about 25,200 square miles. The Site is located within the Sullivan sub-basin, the largest sub-basin in the watershed, draining 142 square miles.

Characteristic uses include the following: water supply (domestic, industrial, agricultural); stock watering; fish migration; fish 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.

#### SURFACE WATER QUALITY CRITERIA

Applicable criteria are defined in Chapter 173-201A WAC for aquatic biota. In addition, Method B groundwater cleanup levels, which evaluated surface water cleanup criteria based on human health as well as aquatic health criteria, were established for Site. The most stringent criteria were used to establish the cleanup concentration. The discharge limits are set at the cleanup levels. Criteria for this discharge are summarized below:

pH	<u>6.5</u> to <u>8.5</u> standard units
Arsenic	5 micrograms per liter
Chromium	10 micrograms per liter
Lead	5 micrograms per liter
Manganese	2,240 micrograms per liter

A temperature total maximum daily limit (TMDL) was established for Sullivan Creek by the United States Forest Service (USFS). The temperature TMDL was established at 16 degrees Celsius, but encompasses only USFS property and therefore does not apply to the Site. Based on the current influent conditions, water quality criteria should not be exceeded after treatment.

#### 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.

Toxicity caused by unidentified pollutants is not expected in the effluent from this discharge as determined by the screening criteria given in Chapter 173-205 WAC. Therefore, no whole effluent toxicity testing is required in this permit. The Department may require effluent toxicity testing in the future if it receives information that toxicity may be present in this effluent.

## 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 determination is based on the Department's knowledge of data or process information indicating regulated chemicals occur in the discharge.

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 discharger has a reasonable potential to cause a violation of water quality standards for arsenic and manganese, thus effluent limits for those chemicals will be placed in the permit. The resultant effluent limits are as follows:

PARAMETER	MAXIMUM DAILY LIMITATION
Arsenic	0.018 micrograms per liter
Manganese	50 micrograms per liter

As discussed, the National Toxics Rule was identified as an applicable regulation for establishing cleanup levels at the Site. However, the area background arsenic concentration of 5 micrograms per liter was established as the site cleanup level since a cleanup level cannot be set below area background concentrations. In the case of manganese, the 50 micrograms per liter concentration is based on aesthetics and not toxicological criteria that directly affect human health. A human health derived cleanup level was established for the Site at 2,240 micrograms per liter. Since the two constituents that have human health criteria established under the NTR are not appropriate concentrations for the Site for reasons described above, the discharge limits will be set at Site cleanup levels and are considered protective of human health.

## 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 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).

This Permittee has no discharge to ground and therefore no limitations are required based on potential effects to ground water.

### **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.2. 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.

### *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 S3. are based on the authority to specify any appropriate reporting and recordkeeping requirements to prevent and control waste discharges (WAC 173-220-210).

### *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 will be submitted as 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

### *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 for 5 years.

### 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.

#### GeoSyntec Consultants, Inc.

Engineering Report and NPDES Application – Lehigh Cement Company Closed Cement Kiln Dust Pile, Metaline Falls, Washington submitted on March 15, 2006.

#### 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(E2). (Cited in EPA 1985 op.cit.)

## **APPENDIX A--PUBLIC INVOLVEMENT INFORMATION**

The Department has tentatively determined to issue 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.

The Department will publish a Public Notice of Draft (PNOD) on August 9, 2006 in The Newport Miner 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:

Water Quality Permit Coordinator  
Department of Ecology  
Eastern Regional Office  
4601 North Monroe  
Spokane, WA 99205

Any interested party may comment on the draft permit or request a public hearing on this draft permit within the thirty (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 thirty (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 thirty (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, (509) 329-3589, or by writing to the address listed above.

This permit and fact sheet was written by William J. Fees, 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<sub>5</sub>**--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<sub>5</sub> 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>.

**APPENDIX D--RESPONSE TO COMMENTS**

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