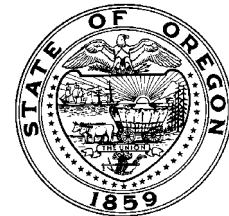


NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT Permit Evaluation Review Report

Oregon Department of Environmental Quality
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Public Notice Draft

Permittee: Oregon-Canadian Forest Products, Inc.	Facility Location: 31950 NW Commercial St. North Plains, Oregon
Sources Covered: Two boilers and two humidistats	Receiving Stream: McKay Creek
Source Category: Industrial minor	Proposed Action: To renew a National Pollutant Discharge Elimination System wastewater discharge permit
File Information: WQ-Washington County File No. 108025 EPA Reference No.: OR 003932-2 Application Date: 10 November 2005 Application No. 979588 Permit No. 101634	Source Contact: Chris Mackin 503/647-5011 PO Box 279 North Plains OR 97133
Preparer: Elliot Zais, PhD, PE Water Quality Source Control Section Northwest Region 503/229-5292	Date Prepared: 27 March 2007 Preparer Signature: _____

Fact sheets are required by EPA regulations to include the following items when applicable.

A brief description of the type of facility or activity which is the subject of the draft permit;

The type and quantity of wastes, fluids, or pollutants which are proposed to be or are being treated, stored, disposed of, injected, emitted, or discharged.

A brief summary of the basis for the draft permit conditions including references to applicable statutory or regulatory provisions and appropriate supporting references to the administrative record required by §124.9 (for EPA-issued permits);

Reasons why any requested variances or alternatives to required standards do or do not appear justified;

A description of the procedures for reaching a final decision on the draft permit including:

- (i) The beginning and ending dates of the comment period under §124.10 and the address where comments will be received;
- (ii) Procedures for requesting a hearing and the nature of that hearing; and
- (iii) Any other procedures by which the public may participate in the final decision.

Name and telephone number of a person to contact for additional information.

Justification for waiver of any application requirements under §122.21(j) or (q) of this chapter.

Any calculations or other necessary explanation of the derivation of specific effluent limitations and conditions or standards for sewage sludge use or disposal, including a citation to the applicable effluent limitation guideline, performance standard, or standard for sewage sludge use or disposal as required by §122.44 and reasons why they are applicable or an explanation of how the alternate effluent limitations were developed.

When the draft permit contains any of the following conditions, an explanation of the reasons that such conditions are applicable:

- (i) Limitations to control toxic pollutants under §122.44(e) of this chapter;
- (ii) Limitations on internal waste streams under §122.45(i) of this chapter;
- (iii) Limitations on indicator pollutants under §125.3(g) of this chapter;
- (iv) Limitations set on a case-by-case basis under §125.3 (c)(2) or (c)(3) of this chapter, or pursuant to Section 405(d)(4) of the CWA;
- (v) Limitations to meet the criteria for permit issuance under §122.4(i) of this chapter, or
- (vi) Waivers from monitoring requirements granted under §122.44(a) of this chapter.

INTRODUCTION

The applicant has applied for renewal of their NPDES permit to allow the discharge of process wastewater from remanufacturing operations, including humidistat blowdown and boiler blowdown. The Department has decided to include monitoring of lumber sprinkling water which had been excluded from the previous renewal. This is discussed below.

Oregon-Canadian's NPDES permit expired on 31 December 2005.

FACILITY DESCRIPTION AND UPDATE

Oregon-Canadian (O-C) operates a lumber remanufacturing facility in North Plains, Oregon. The facility is divided into four main sections. These include an almost entirely paved main office site covering about 5.5 acres, a mostly paved north operations site covering about 8 acres, an almost entirely paved southwest operations site covering about 3.7 acres, and an undeveloped farmland covering about 8.6 acres. City streets and McKay Creek subdivide the property. Facilities at the site include two office buildings and a variety of process and storage buildings as well as open storage areas.

Water is used at the site for both process and domestic purposes. Domestic uses include normal drinking water and sanitation requirements. Wastewaters resulting from domestic uses are collected and directed to the Clean Water Services (CWS) sanitary sewer system for treatment at their publicly owned treatment works (POTW).

Process water uses at the site include water supplies for both boiler and dry kiln wet bulb thermometers (humidistat) and wet storage of raw lumber products. Wastewaters generated by process operations are discharged either to the USA stormwater system and then to McKay Creek or directly to McKay Creek thru multiple discharge points.

Boiler and humidistat flows each occur from two locations. Boiler flow analysis indicates that these flows are essentially clean water which has been softened and treated with traditional boiler scale and pH control chemicals and have only trace contaminant levels of sulfate, alkalinity, and chlorine. Sulfate concentration is 5 mg/L and alkalinity is 600 mg/L. There is no limitation in the regulations for sulfate and the fresh water chronic limit for alkalinity is 20 mg/L. The Tualatin TMDL provides a zone of dilution of one-quarter of the 7Q10 for a temperature allocation. This same zone of dilution as a mixing zone would be more than sufficient to quickly dilute the alkalinity to below 20 mg/L. See further discussion below. Humidistat flows are softened water which has not been chemically treated and are used to supply moisture to the wet bulb thermometer wicks and is overflowed to prevent scale buildup. Both of these flows are small (a few hundred gallons per day) and are discharged at elevated temperatures, cooling ambiently prior to discharge to McKay Creek. This is discussed further below when temperature is addressed.

Wet storage of lumber products is required to prevent checking and splitting of raw lumber products prior to processing. Wet storage is presently accomplished at two of the three active sites, the north site and the southwest site, by use of sprinklers during the dry months and by natural precipitation during wet periods. Sprinkling usually starts when temperature reaches 70 °F. The sprinkling period is roughly from May through September and has averaged about 118 days per year from 2002 through 2006. The sprinklers distribute water over the stacked raw lumber. Sprinkler flows which

do not evaporate flow overland into the series of drains, ditches, and catch basins on and surrounding the sites and/or directly into McKay Creek. The wet storage flows are not well characterized because most of the flow is on the ground and not in any kind of channel or pipe. The sprinkler heads discharge about 21 000 gpd (0.06 cfs) in full operation. The operational cycle is typically sprinkling for 12 hours per day. Much of the water is absorbed by the stored lumber, some is evaporated, and some flows to ditches in the street and then into McKay Creek. We do not have temperature data from these flows. Additional monitoring will be required during summer months to determine whether any limitations are needed in the permit. Monitoring will be in McKay Creek upstream of the first sprinkling operations and downstream of the last operations.

Precipitation or stormwater runoff impacting the site is in some cases exposed to raw, intermediate, or final products. The stormwater flows drain to the CWS stormwater system and then to McKay Creek or directly to McKay Creek thru multiple discharge points.

The distributed nature of the site, intermittent nature of wastewater flows, complexity of existing drainage systems and presence of McKay Creek transecting the property result in an extremely complex process and stormwater management system. Five discrete process wastewater discharge points and six stormwater discharge points were previously identified. The five discharges were reduced to two in 2003 but will be three for this renewal. The stormwater discharges will be regulated under a 1200-Z industrial stormwater permit. Additional complications have historically resulted from offsite sources of contamination which share these systems. The Dant & Russell wood treating site is directly north of O-C and has in the past contributed visibly to the drainage collection system. According to Jill Kiernan formerly of the Department's Land Quality Division, Dant & Russell is no longer causing any surface water impact.

UNIQUE OPERATING CONDITIONS AND PROBLEMS

O-C sprinkles water on lumber to prevent checking. The water runs off into McKay Creek and is difficult to trap and treat. The runoff water has a BOD load from the sugar in the lumber. This flow has been significantly reduced as described below under Outfalls.

STORMWATER

Stormwater flows will be regulated under the Department's 1200-Z general industrial stormwater permit.

GROUNDWATER

Groundwater is not an issue at this facility.

OUTFALLS

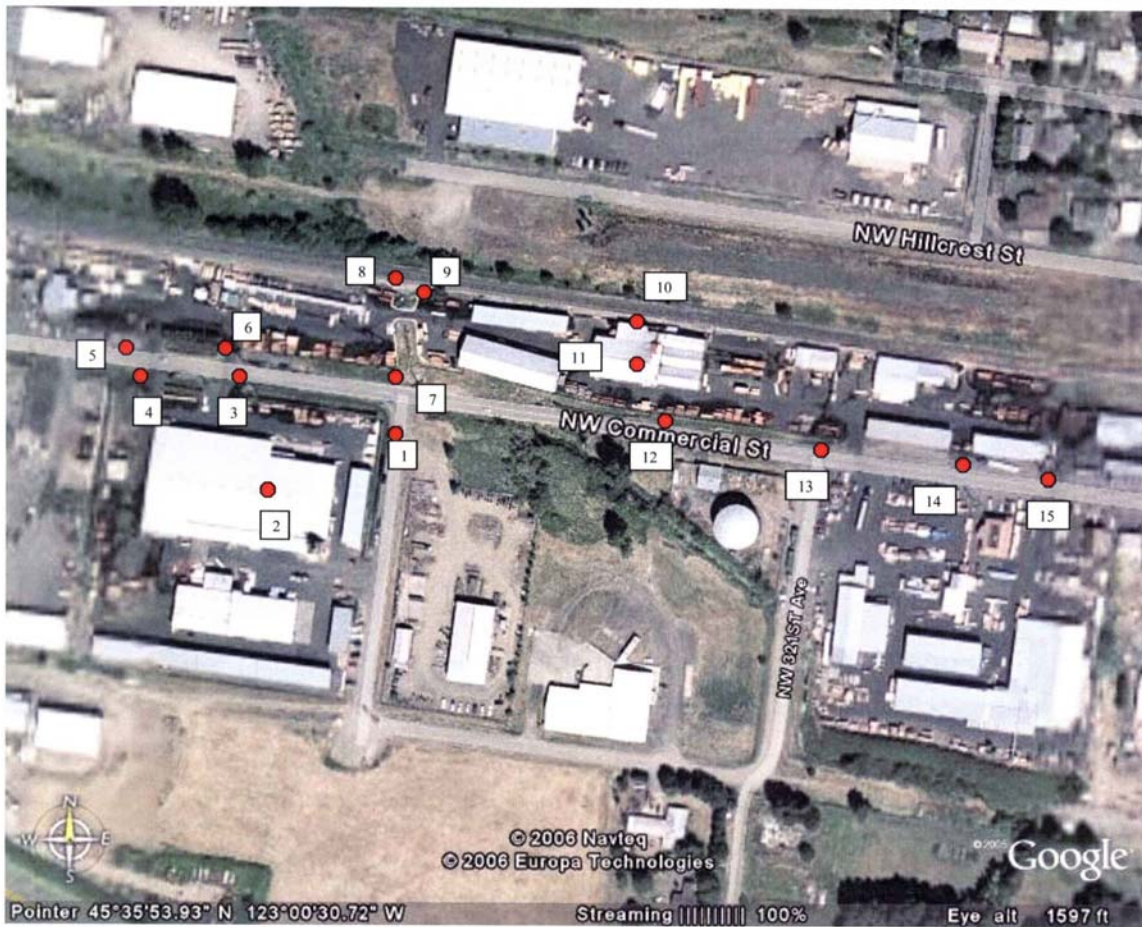
The permittee previously had five outfalls either on McKay Creek or draining to it. For the previous renewal the permittee requested that Outfalls #3 and #4 be eliminated because of new sprinkler heads. The previous 7 GPM Impact Heads have been replaced by 2.5 GPM Pop Up Heads. The permittee stated that “this has virtually eliminated the amount of water that drains from our yard and there is no longer enough to sample at the above outfalls.” For this renewal we have reconsidered the sprinkler water and found that it does need to be included, but with different monitoring conditions than previously.

The last renewal included only Outfalls #1 and #2. There has been confusion about sampling locations for some time which led to a site inspection in February 2006 and subsequent discussions of where and how sampling should be done. This renewal will include the following outfalls as shown on the photo below:

Outfall #1 (new boiler) At Location 1. This will capture flows from Locations 1, 3, and 4.
Outfall #2 At Location 14. This will capture flows from Locations 14 and 15.
Outfall #3 At Location 7. This will capture flows from Locations 5, 6, and 7.

These locations should provide representative samples for the entire site.

The evaporator which eliminated the wastewater from the new boiler and humidistat was up and running in December 2006.



THREATENED AND ENDANGERED SPECIES REVIEW

The following summary is from the Tualatin Subbasin TMDL, 2001.

The Tualatin River is home to Winter Steelhead, Coho Salmon, and resident Cutthroat Trout. Winter Steelhead are currently listed as threatened by the National Marine Fishery Service under the Endangered Species Act. These fish are generally in decline in the subbasin and have been lost from some tributaries due to a variety of factors that also include changes in habitat and water quality. In addition, the Tualatin River is receiving increasing use for water contact recreation (e.g. canoeing, fishing, and swimming) as the nearby population increases and access to the river through parks and boat ramps has increased.

According to The Oregon Department of Fish and Wildlife, McKay Creek is a rearing area for cutthroat trout and occasionally steelhead. ODFW published a report in 2001 entitled Distribution and Abundance of Fish, and Measurement of Available Habitat in the Tualatin River Basin Outside of the Urban Growth Boundary. The report found abundant cutthroat trout, reticulate sculpin, and other fish upstream of O-C. At a sampling point a few

blocks downstream of O-C there were abundant sculpin but few other fish. This sampling point was in the middle reach of McKay Creek. The Discussion section of the report follows.

Species sensitive to habitat degradation (salmonids, torrent sculpin, and western brook lamprey) were found primarily in stream reaches above obvious signs of habitat degradation. Habitat characteristics associated with these reaches include higher gradient, swift water, rocky substrate, lower water temperatures and a higher percent of shade. Important salmonid spawning and rearing habitat is most likely to be found in upper reaches of all streams surveyed.

A few sunfish (unidentified *Lepomis* spp. and largemouth bass) were the only fish found that are extremely tolerant of warm temperatures, organic pollution and sedimentation (Hughes et al. 1998). These individuals were found only in the middle reaches of McKay, Christensen, and W. Dairy creeks. Excluding reticulate sculpin, which were found in all 24 stream reaches sampled, species moderately tolerant of habitat degradation were found predominantly in lower and middle reaches. These reaches also contained relatively few sensitive species such as salmonids, which may indicate the presence of factors limiting the production of these species.

Crayfish populations in tributaries of the Tualatin River appear to be healthy. Crayfish were found in all reaches, with the exception of upper Christensen. Observations of crayfish were highest during summer sampling then declined during fall and winter with a marginal increase during spring. The high variability of crayfish counts among seasons was most likely due to changes in flow and turbidity during fall and winter months. In addition, crayfish become completely inactive during winter (Oregon State University Extension Service 1978)

Historically, coho salmon were not found in the Tualatin River basin. However, with the addition of a fish ladder at Willamette falls, the possibility of strays from other basins entering the Tualatin River, and previous introduction of hatchery stocks, some natural production of coho salmon is now occurring in the basin. We observed juvenile coho salmon in reaches of Gales Creek, lower Roaring Creek and the upper Tualatin River.

Sustained water temperatures of above 12.8°C are considered too high for salmonid spawning and rearing, and temperatures above 20°C can have detrimental effects on other cold water species (DEQ 2000). None of the reaches sampled were found to have water temperatures above 20°C and only four reaches were above 12.8°C.

A biological assessment done at the facility by the Department in 1995 indicates impairment to the macroinvertebrate community at all three of the stations sampled, but the impacts are believed to have occurred before reaching Oregon Canadian property.

The Department believes that the requirements imposed by the NPDES permit are protective of water quality and habitat.

POLLUTANTS DISCHARGED AND PROPOSED LIMITS

Pollutants of Concern

The first step is to determine the pollutants of concern that need analyzing to conclude whether effluent limits are needed for those pollutants. The major sources of information for this step are the sampling data accumulated by the site.

Technology-Based Effluent Limits 40 CFR 122.44(a) and (e)

These limits are based on effluent limitations and standards promulgated under section 301 of the CWA, or new source performance standards promulgated under section 306 of the CWA, on case-by-case effluent limitations determined under section 402(a)(1) of the CWA, or a combination of the three in accordance with 40 CFR 125.3.

Water Quality-Based Effluent Limits 40 CFR 122.44(d)

These limits are any requirements in addition to or more stringent than promulgated effluent limitations guidelines or standards under sections 301, 304, 306, 307, 318 and 405 of the CWA necessary to achieve water quality standards established under section 303 of the CWA, including State narrative criteria for water quality.

The Department is required to set effluent limits for pollutants that may be discharged at levels that cause, or have the reasonable potential to cause, an excursion above any numeric or narrative state water quality standard [40 CFR 122.44(d)(1)(i)]. When determining whether a discharge causes or has the reasonable potential to cause an instream excursion above a narrative or numeric State water quality standard, the Department must account for existing controls on point sources, the variability of the pollutant, and the dilution of the effluent in the receiving water.

The following pollutant parameters are of concern for Oregon-Canadian: Total dissolved solids (TDS), oil and grease, five day biochemical oxygen demand (BOD₅), pH, dissolved oxygen, alkalinity, and temperature.

340-041-004 Antidegradation Review

In order to issue a permit, the Department must perform a review per the requirements of Oregon Administrative Rules, OAR 340-041-0004. The Department must determine that the discharge will not cause or contribute to any water quality violations before allowing a new mass load discharge. This is a not a new or increased load, but the review is still useful. Below is a listing of the required

findings and considerations, followed by the Department's conclusions. Numbered paragraphs are taken from the Oregon Administrative Rules.

(1) Purpose. The purpose of the Antidegradation Policy is to guide decisions that affect water quality such that unnecessary further degradation from new or increased point and nonpoint sources of pollution is prevented, and to protect, maintain, and enhance existing surface water quality to ensure the full protection of all existing beneficial uses. The standards and policies set forth in OAR 340-041-0007 through 340-041-0350 are intended to supplement the Antidegradation Policy.

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

(2) Growth Policy. In order to maintain the quality of waters in the State of Oregon, it is the general policy of the Commission to require that growth and development be accommodated by increased efficiency and effectiveness of waste treatment and control such that measurable future discharged waste loads from existing sources do not exceed presently allowed discharged loads except as provided in section (3) through (9) of this rule.

Conclusion. Runoff from log sprinkling has been significantly decreased.

(9)(a)(C) The new or increased discharged load will not unacceptably threaten or impair any recognized beneficial uses or adversely affect threatened or endangered species. In making this determination, the Commission or Department may rely upon the presumption that if the numeric criteria established to protect specific uses are met the beneficial uses they were designed to protect are protected. In making this determination the Commission or Department may also evaluate other State and federal agency data that would provide information on potential impacts to beneficial uses for which the numeric criteria have not been set.

Conclusion. The identified beneficial uses in the Tualatin River Subbasin are as follows:

- Public Domestic Water Supply
- Salmonid Fish Spawning (Trout)
- Private Domestic Water Supply
- Salmonid Fish Rearing (Trout)
- Industrial Water Supply
- Resident Fish and Aquatic Life

Irrigation
Anadromous Fish Passage
Livestock Watering
Wildlife and Hunting
Boating
Fishing
Hydro Power
Water Contact Recreation
Aesthetic Quality

There is no new or increased load.

(9)(b) The activity, expansion or growth necessitating a new or increased discharge load is consistent with the acknowledged local land use plans as evidenced by a statement of land use compatibility from the appropriate local planning agency.

Conclusion. O-C filed a land use compatibility statement with the City of North Plains. It was approved.

(9)(c) Oregon's water quality management policies and programs recognize that Oregon's water bodies have a finite capacity to assimilate waste. Unused assimilative capacity is an exceedingly valuable resource that enhances in-stream values and environmental quality in general. Allocation of any unused assimilative capacity should be based on explicit criteria. In addition to the conditions in subsection (a) of this section, the Commission or Department may consider the following:

(A) Environmental Effects Criteria:

(i) Adverse Out-of-Stream Effects. There may be instances where the discharge or limited discharge alternatives may cause greater adverse environmental effects than the increased discharge alternative.

Conclusion. Not applicable to this situation.

(ii) Instream Effects. Total stream loading may be reduced through elimination or reduction of other source discharges or through a reduction in seasonal discharge. A source that replaces other sources, accepts additional waste from less efficient treatment units or systems, or reduces discharge loadings during periods of low stream flow may be permitted an increased discharge load year-round or during seasons of high flow, so long as the loading has no adverse effect on threatened and endangered species;

Conclusion. The discharge from lumber sprinkling has been reduced by the installation of lower volume sprinkler heads and by the installation of shade cloth to reduce evaporation.

Humidistat and blowdown water from the new boiler are no longer being discharged to surface water. They are being evaporated.

(iii) Beneficial Effects. Land application, upland wetlands application, or other non-discharge alternatives for appropriately treated wastewater may replenish groundwater levels and increase streamflow and assimilative capacity during otherwise low streamflow periods.

Conclusion. Not applicable to this situation.

(9)(c)(B) Economic Effects Criteria:

(i) Value of Assimilative Capacity. The assimilative capacity of Oregon’s streams is finite, but the potential uses of this capacity are virtually unlimited. Thus it is important that priority be given to those beneficial uses that promise the greatest return (beneficial use) relative to the unused assimilative capacity that might be utilized. In-stream uses that benefit from reserve assimilative capacity, as well as potential future beneficial use, will be weighed against the economic benefit associated with increased loading.

Conclusion. O-C took over this facility in 1977. There has been a mill on the site since the early 1950s. The dry kilns were installed in the 1950s. DEQ conducted a study on McKay Creek in May 1995 with the objective of documenting instream effects on water quality. The study report concluded that “Biological assessment indicated impairment to the macroinvertebrate community at all three of the stations sampled.” As mentioned above, the impacts occurred before reaching O-C property.

The assimilative or loading capacity is defined as “the greatest amount of loading that a water body can receive without violating water quality standards.” The Tualatin Basin TMDL document lists the 7Q10 flowrate of McKay Creek as 0.2 cfs. The renewal application gives average flowrates as shown in the following table:

Operation	Average Flow	Days of Operation	Frequency	
			Days/week	Months/year
Old boiler blowdown	50 GPD	260	5	12
Old kiln Humidistat	117 GPD	260	7	12
All lumber sprinkling	21 000 GPD	118	7	6

The flows from the new boiler blowdown and new kiln humidistat have been eliminated. The boiler and humidistat discharges total 167 GPD or 0.00025 cfs or 0.13 percent of McKay Creek’s 7Q10 flowrate. The lumber sprinkling uses 21 000 gpd of well water. It is very difficult to get a reasonable estimate of how much of this water flows into McKay Creek. This discharge is not expected to use a significant portion of McKay Creek’s assimilative capacity.

(ii) Cost of Treatment Technology. The cost of improved treatment technology, nondischarge, and limited discharge alternatives may be evaluated.

Conclusion. New sprinkler heads have been installed which have significantly reduced the discharge from sprinkling lumber.

As with all NPDES permits issued for facilities that propose to discharge wastewater to waters of the state, the proposed draft permit for the O-C facility was drafted to ensure that all state wide water quality standards contained in OAR 340-041-0007 through 340-041-0053 and all basin-specific water quality standards would be achieved.

Each of the parameters listed is discussed below followed by the conclusions reached during this review.

340-041-0007

Statewide Narrative Criteria

(1) Notwithstanding the water quality standards contained in this Division, the highest and best practicable treatment and/or control of wastes, activities, and flows must in every case be provided so as to maintain dissolved oxygen and overall water quality at the highest possible levels and water temperatures, coliform bacteria concentrations, dissolved chemical substances, toxic materials, radioactivity, turbidities, color, odor, and other deleterious factors at the lowest possible levels.

Conclusion. The current water treatment is appropriate to meet this condition.

(2) Where a less stringent natural condition of a water of the State exceeds the numeric criteria set out in this Division, the natural condition supersedes the numeric criteria and becomes the standard for that water body. However, there are special restrictions, described in OAR 340-041-0004(9)(a)(C)(iii), that may apply to discharges that affect dissolved oxygen.

Conclusion. Not applicable in this situation. No less stringent natural condition has been identified. Therefore, the established numeric criteria will be used for this site.

(11) Fungi.

Conclusion. The O-C facility's discharge is not expected to contain fungi or to promote their growth.

(12) Tastes or odors.

Conclusion. Based on the known pollutants in the facility's process stream, the O-C facility's discharge is not expected to create tastes or odors or toxic or other conditions deleterious to aquatic life or to affect potability of drinking water or palatability of fish or shellfish.

(13) Deposits.

Conclusion. The O-C facility's discharge is not expected to contain material which would cause appreciable deposition in the river.

(14) and (15) Objectionable conditions and offensive aesthetic conditions.

Conclusion. Based on previous operation, the O-C facility's discharge is not expected to cause offensive aesthetic conditions.

(16) Radioisotopes.

Conclusion. No radioactive materials are used in the facility's processes. The O-C facility's discharge is not expected to contain radioisotopes.

340-041-0009

Bacteria

Conclusion. There is no sewage connected with this discharge. The O-C facility's discharge is not expected to contain bacteria.

340-041-0016

Dissolved Oxygen

(1) Dissolved oxygen (DO): No wastes may be discharged and no activities must be conducted that either alone or in combination with other wastes or activities will cause violation of the following standards: The changes adopted by the Commission on January 11, 1996, become effective July 1, 1996. Until that time, the requirements of this rule that were in effect on January 10, 1996, apply:

(a) For water bodies identified as active spawning areas in the places and times indicated on the following Tables and Figures set out in OAR 340-041-0101 to OAR 340-041-0340: Tables 101B, 121B, 180B, 201B and 260B, and Figures 130B, 151B, 160B, 170B, 220B, 230B, 271B, 286B, 300B, 310B, 320B, and 340B, (as well as any active spawning area used by resident trout species), the following criteria apply during the applicable spawning through fry emergence periods set forth in the tables and figures:

- (A) The dissolved oxygen may not be less than 11.0 mg/l. However, if the minimum intergravel dissolved oxygen, measured as a spatial median, is 8.0 mg/l or greater, then the DO criterion is 9.0 mg/l;
- (B) Where conditions of barometric pressure, altitude, and temperature preclude attainment of the 11.0 mg/l or 9.0 mg/l criteria, dissolved oxygen levels must not be less than 95 percent of saturation;
- (C) The spatial median intergravel dissolved oxygen concentration must not fall below 8.0 mg/l.

Conclusion. McKay Creek is identified as a resident trout spawning creek from January 1 through May 15. Log sprinkling is normally done from May through September. The sprinkling could mobilize sugars and other chemicals from the lumber which could affect DO in the creek. DO considerations might be of concern during storm events also. The permit will require a full year of DO monitoring to determine whether DO is a concern.

For BOD₅, the permit has a daily maximum limit of 15 mg/L and a monthly average limit of 7.5 mg/L.

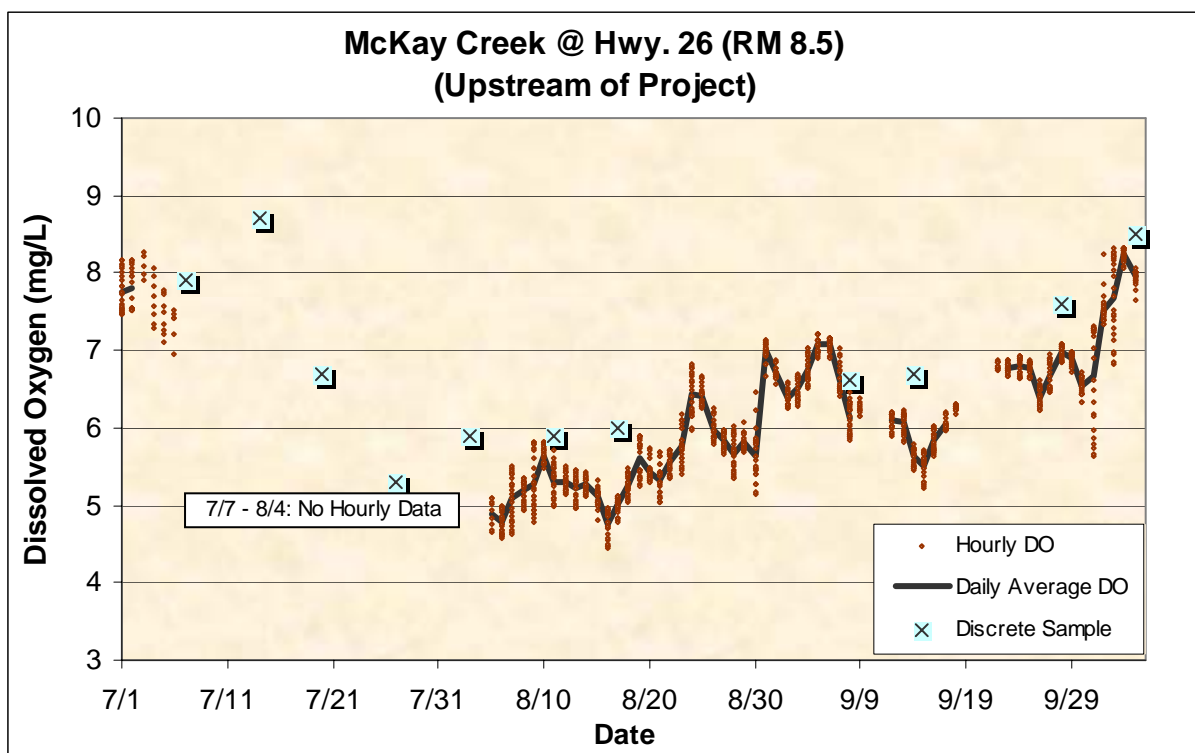
Clean Water Services has a monitoring station on McKay Creek at Highway 26. The following table and chart show that dissolved oxygen in the creek varies significantly. The data are from 2005. The average DO measured in May was 9.9 mg/L. The average DO percent saturation was 91.5 %. The average DO from May through September was 8.0 mg/L. The average DO percent saturation was 75.0 %. These results are below the standard quoted above. I performed a Streeter-Phelps analysis using available data, but it is difficult to draw conclusions from such sparse data. The spreadsheet is attached.

This permit will require monitoring of DO upstream and downstream of the facility for a full year from date of permit issuance. The Department will evaluate collected data to determine whether any DO limits need to be added to this permit.

McKay Creek @ Hwy. 26 (RM 8.5)

(Year 2005)

Parameter	Unit	4-May	11-May	19-May	25-May	1-Jun	8-Jun	15-Jun	22-Jun	29-Jun	7-Jul	14-Jul	20-Jul	27-Jul	3-Aug	11-Aug	17-Aug	8-Sep	14-Sep	28-Sep	5-Oct
DEPTH	ft	2.2																			
TEMP, C	deg C	13.3	10.9	11.4	11.7	13.2	12.1	12.8	16	14.6	17.1	15.7	17.1	18	16.9	17.4	17.8	15.33	13.6	11.4	11.4
Conductivity (field)	uS/cm	84	60	67	66	79	77	84	88	94	97	96	107	112	120	128	127	125	127	112	96
Conductivity (lab)	uS/cm	83	62	66	68	78	80	84	92	95	93	96	106	112	114	134	126	125	126	111	94
DO (field)	mg/L	8.9	10.7	9.8	10.2	9.4	10	9	7.7	8.6	7.9	8.7	6.7	5.3	5.9	5.9	6	6.62	6.7	7.6	8.5
DO-%SAT	%	85	97	90	94	90	93	85	78	84	81	88		56	61	61	64	66.2	64	70	78
COD (total)	mg/L	< 2.5	10.6	12.3	11.7	10.9	8.9	13.1	16.1	E 3.8	6.3	E 4.3	5.8	9.5	8.9	E 4.3	8.3	8.2	6.5	6.9	6.9
PH (field)	S.U.	7.1	7.5	6.9	7.5	7.1	7.7	7.3	7.5	7.3	7.6	7.3	7.2	7	7.3	7.4	7	7.18	7.2	7.3	7.3
PH (lab)	S.U.	7.27	7.04	7.07	7.14	7.25	7.3	7.37	7.29	7.41	7.41	7.4	7.49	7.24	7.45	7.36	7.4	7.36	7.3	7.29	7.28
Alkalinity (total)	mg/L	34.5																			
TS	mg/L	78	112	124	78	70	78	76	86	80	92	86	98	88	98	110	114	108	112	100	84
TDS	mg/L	70	75	45	62	63	71	70	77	73	83	78	90	81	91	102	107	99	105	94	80
TSS	mg/L	7.6	37.2	79.2	16	6.8	7.2	5.6	9.2	7.2	9.2	7.6	7.6	6.8	7.2	8	7.2	9.2	7.2	5.6	3.6
NH3-N (sol)	mg/L	.044	.054	.038	.022	.029	.025	.026	.035	.033	.033	.035	.038	.04	.05	.052	.054	.047	.054	.038	.045
TKN	mg/L	.242	.458	.353	.178	.173	.187	.271	.354	.274	.259	.265	.233	.328	.336	.388	.39	.362	.341	.31	.358
NO2/NO3-N (sol)	mg/L	.81	1.5	1.33	1.24	.88	.692	.575	.466	.397	.357	.282	.3	.266	.246	.249	.243	.146	.183	.097	.332
Total Phosphorus	mg/L	E .048	.094	.118	.061	E .085	E .031	.052	.073	.056	.057	.063	.065	.082	.082	.102	.112	.113	.113	.094	.075
Ortho P (sol)	mg/L	.013	.018	.018	.013	.018	.016	.018	.023	.026	.028	.025	.023	.036	.033	.032	.05	.054	.036	.03	.036
Chloride (sol)	mg/L	3.4	2.39	2.67	2.8	3.13	3.41	3.54	3.74	4.04	4.08	3.52	3.9	4.25	4.52	5.69	4.55	4.9	5.31	4.33	4.59
TURBIDITY	NTU	6.2	26	30	9.5	6.3	6.4	6.4	9.6	8.6	8.7	8.9	9.4	8.8	7.9	9	9.7	11	10	7.7	6.9



340-041-0021

pH

(1) Unless otherwise specified in OAR 340-041-0101 through 340-041-0350, pH values (Hydrogen ion concentrations) may not fall outside the following ranges:

- (a) Marine waters: 7.0 – 8.5;
- (b) Estuarine and fresh waters: 6.5 – 8.5.

(2) Waters impounded by dams existing on January 1, 1996, which have pHs that exceed the criteria are not in violation of the standard, if the Department determines that the exceedance would not occur without the impoundment and that all practicable measures have been taken to bring the pH in the impounded waters into compliance with the criteria.

Willamette Basin

(1) pH (hydrogen ion concentration). pH values may not fall outside the following ranges:

- (a) All basin waters (except main stem Columbia River and Cascade lakes): 6.5 to 8.5;

Conclusion. Based on a review of the discharge monitoring report data collected during the previous permit term, the proposed discharge from the O-C facility is not expected to have a pH outside the range 6.5 - 8.5. O-C monitors pH weekly. The pH is normally within the required range.

340-041-0028

Temperature

(4) Biologically Based Numeric Criteria. Unless superseded by the natural conditions criteria described in section (8) of this rule, or by subsequently adopted site-specific criteria approved by EPA, the temperature criteria for State waters supporting salmonid fishes are as follows:

(c) The seven-day-average maximum temperature of a stream identified as having salmon and trout rearing and migration use on subbasin maps set out at OAR 340-041-0101 to 340-041-0340: Figures 130A, 151A, 160A, 170A, 220A, 230A, 271A, 286A, 300A, 310A, 320A, and 340A may not exceed 18.0 degrees Celsius (64.4 degrees Fahrenheit);

(8) Natural Conditions Criteria. Where the department determines that the natural thermal potential of all or a portion of a water body exceeds the biologically-based criteria in section (4) of this rule, the natural thermal potential temperatures supersede the biologically-based criteria, and are deemed to be the applicable temperature criteria for that water body.

Conclusion. As mentioned above, according to ODF&W, McKay Creek is a rearing area for cutthroat trout and occasionally steelhead. O-C's heated boiler discharge is of the order of a few hundred gallons per day. Boiler water moves slowly over rocks for about 200 meters before it discharges into McKay Creek. This is unlikely to have an effect on the creek.

O-C's Steve Getsiv conducted a temperature test on February 27, 1997. He measured the temperature of water leaving the boiler, along the flow path and at the outfall. The results are shown below:

<u>Distance from Boiler, Meters</u>	<u>Temperature, Degrees Celsius</u>
Boiler outlet	100
3	51.7
12	29.4
30	22.2
200, at stream	11.1

Stream temperature above and below the point of entry was 8.9 °C while the ambient temperature was 15.6 °C. Using the stream 7Q10 flowrate of 0.2 cfs and boiler flows of 350 gpd or 0.00054 cfs, the calculated temperature elevation assuming complete mixing is 0.006 °C calculated as follows:

$$T_{\text{mix}} = (T_{\text{eff}} \times Q_{\text{eff}} + T_{\text{stream}} \times Q_{\text{stream}}) / (Q_{\text{eff}} + Q_{\text{stream}}) =$$

$$8.906 \text{ } ^\circ\text{C} = (11.1 \text{ } ^\circ\text{C} \times 0.00054 \text{ cfs} + 8.9 \text{ } ^\circ\text{C} \times 0.2 \text{ cfs}) / (0.20054 \text{ cfs})$$

The boiler flows currently would be about 170 gpd causing even less temperature impact. McKay Creek is water quality limited for temperature during Summer. A temperature

TMDL has been developed. O-C was given a maximum allowable effluent temperature of 58.1 °F based on an incorrect estimate of discharge flowrate (0.33 cfs) which probably included log sprinkling water. Because of numerous plant improvements in the past few years, the log sprinkling water amounts to about 21 000 gpd or 0.06 cfs sprinkled during 12-hour days from May through September. A more realistic flowrate for heated process water (0.00026 cfs, 170 gpd) gives a maximum allowable effluent temperature greater than 80 °F. A Temperature Management Plan was not developed because the discharge water is well below this temperature when it enters the stream. The low flowrate from the boilers suggests little likelihood of exceeding temperature standards. O-C has monitored the temperature above and below their outfalls for the full term of the current permit. They have never had a measurable increase from upstream to downstream. This has been reported on their monthly discharge monitoring reports. Based on 8 years worth of temperature data, the Department concludes that there is no reasonable potential for the boiler discharge to affect stream temperature.

However, the water which is used for log sprinkling between May and September can pick up heat from solar radiation and from contact with pavement. As mentioned above the Department does not have good estimates of the flow magnitudes or effect on McKay Creek. For this reason, the permit will require temperature monitoring in McKay Creek at the north and south ends of the facility to determine whether O-C's activities add detrimental amounts of heat to the creek.

Total Dissolved Gas.

(1) Waters will be free from dissolved gases, such as carbon dioxide hydrogen sulfide, or other gases, in sufficient quantities to cause objectionable odors or to be deleterious to fish or other aquatic life, navigation, recreation, or other reasonable uses made of such water

Conclusion. Water cascading over dams commonly entrains air to a supersaturated level. Elevated TDG can cause gas bubble disease in aquatic organisms. There is no gas used or generated at this facility. The O-C facility's discharge is not expected to cause increases of dissolved gases in sufficient quantities to cause objectionable odors or to be deleterious to fish or other aquatic life, navigation, recreation, or other reasonable uses made of the receiving water.

340-041-0032

Total Dissolved Solids

The concentrations listed below may not be exceeded unless otherwise specifically authorized by DEQ upon such conditions as it may deem necessary: All Fresh Water Streams and Tributaries - 100 mg/L.

Willamette Basin. 340-041-0345 (2) Total Dissolved Solids. Guide concentrations listed may not be exceeded unless otherwise specifically authorized by DEQ upon such conditions as it may

deem necessary to carry out the general intent of this plan and to protect the beneficial uses set forth in OAR 340-041-0340: Willamette River and Tributaries —100.0 mg/l.

Conclusion. Chemical analysis of O-C's boiler effluent shows approximate TDS levels as high as 2800 mg/L. The boiler and humidistat blowdown flowrates specified in the permit application are about 0.00026 cfs. At the 7Q10 stream flowrate of 0.2 cfs, the dilution ratio is about 770. With a ratio of 770, the TDS meets the guidance value of 100 mg/L.

McKay Creek has TDS concentrations above the 100 mg/L guidance value both above and below O-C's facility. O-C's discharge is not expected to cause a measurable change in TDS.

340-041-0033

Toxic Substances

(1) Toxic substances may not be introduced above natural background levels in the waters of the State in amounts, concentrations, or combinations that may be harmful, may chemically change to harmful forms in the environment, or may accumulate in sediments or bioaccumulate in aquatic life or wildlife to levels that adversely affect public health, safety or welfare, aquatic life, wildlife, or other designated beneficial uses;

(2) Levels of toxic substances may not exceed the criteria listed in Table 20 which were based on criteria established by EPA and published in *Quality Criteria for Water* (1986), unless otherwise noted

Many toxic substances have limits set in OAR 340-041-Table 20. When appropriate, these limits are explicitly stated in NPDES permits. Some toxics are explicitly dealt with in promulgated TMDLs. See discussion below.

Conclusion. The discharge from boiler and humidistat blowdown is not expected to contain toxic substances exceeding applicable water quality standards. The discharge is periodic and of very short duration (two 40-second blasts per day on weekdays) so it is not likely to ever cause a chronic problem from alkalinity.

Based on knowledge of the facility's operations, the discharge is not expected to contain toxic substances exceeding applicable water quality standards.

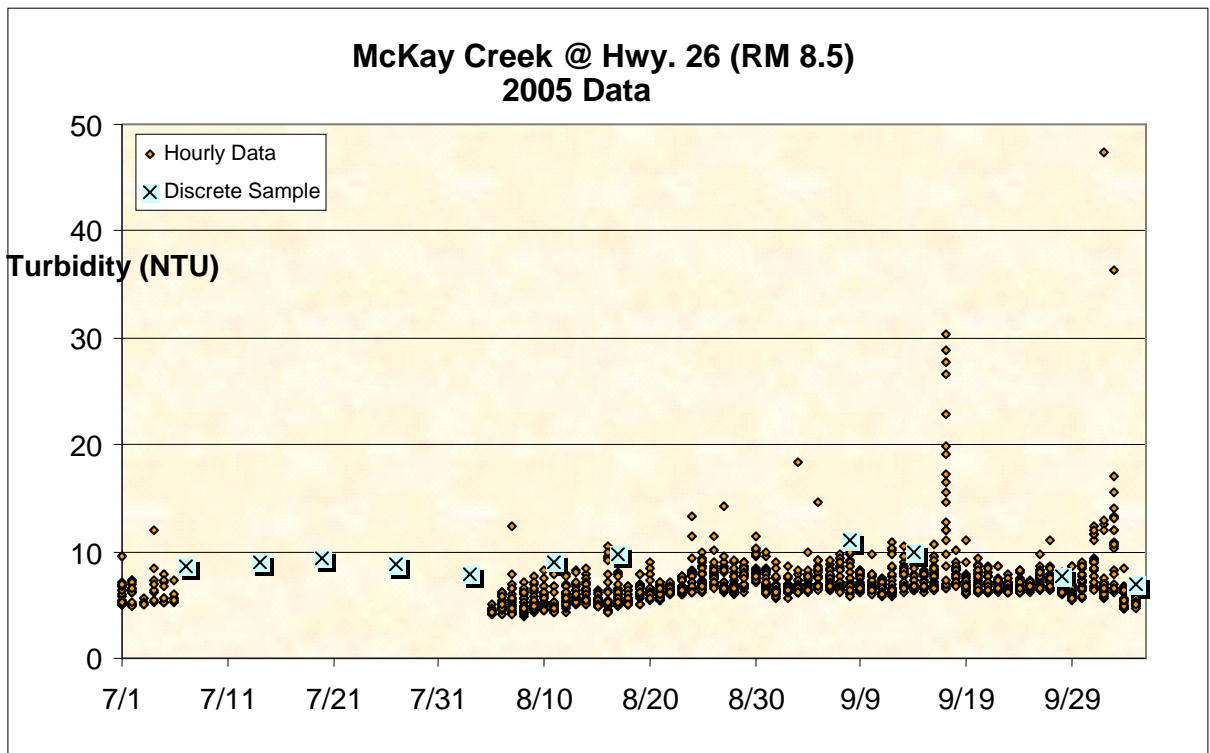
340-041-0036

Turbidity

Turbidity (Nephelometric Turbidity Units, NTU): No more than a ten percent cumulative increase in natural stream turbidities shall be allowed, as measured relative to a control point immediately upstream of the turbidity causing activity.

Conclusion. O-C's discharge does not go directly to McKay Creek. Rather, it goes into a shallow ditch which drains to McKay Creek. Water in the ditch is often turbid when it is raining. Boiler blowoff water is not expected to be turbid. The discharge from the O-C facility is not expected to affect instream turbidity. The Department does not believe it is necessary to require O-C to monitor for turbidity.

Clean Water Services has a monitoring station on McKay Creek at Highway 26. The following chart shows that turbidity during 2005 was on average below 10 NTU. This is clear water.



340-041-0046

Water Quality Limited Waters

(5) For water bodies designated as water quality limited under OAR 340-041-0002(62)(b), requests for load increases may be considered using the process set out in OAR 340-041-0004(9)(a)

Conclusion: The receiving stream is WQL for phosphorus, ammonia, temperature and e. coli. TMDLs have been developed for these parameters.

340-041-0344

Approved TMDLs in the Basin:

The following TMDLs have been approved by EPA:

Phosphorus	Spring/Summer/Fall
Ammonia	Spring/Summer/Fall
Temperature	Summer
E Coli	Year around

O-C's discharge is not expected to affect either e.coli or temperature in McKay Creek. O-C does not discharge any sanitary wastes to McKay Creek. Ammonia is not present in the discharge. The calculations described above indicate that there would be no measurable temperature increase from O-C's activities.

For the original permit, I performed a mass balance calculation on total phosphorus using the following assumptions:

1. Boiler blowdown flow of 7500 L/day = 7.5 cubic meters/day = 2000 gpd
2. Average stream flowrate of 6000 cubic meters/day = 2.5 cfs
3. Instream concentration of 40 µg/L
4. Measurable difference of 5 µg/L

All the flowrates were different for the 2003 renewal. The flows from the boilers and humidistats averaged about 1.283 m³/day. The 7Q10 low flowrate was 490 m³/day = 0.2 cfs. Also the instream concentration was determined to be 90 µg/L.

Solving for the effluent concentration required to make a measurable difference in the instream concentration gave an effluent concentration of 2 mg/L. This led to a waste load allocation of 3 g/day. O-C has met the previous WLA of 30 g/day consistently during the first permit term.

For this renewal we have revisited the whole phosphorus question. The stream flowrate used in 2003 is still relevant. The background concentration is still 90 µg/L. The effluent flowrate is lower. It is 350 gpd. The mass balance calculation is as follows:

The assumptions are:

1. Boiler and humidistat blowdown flowrate = 350 gpd = 0.000542 cfs = 1.324 m³/d = Q_e
2. Average stream flowrate of 0.2 cfs = Q_r
3. Instream concentration of 90 µg/L = C_r
4. Measurable difference of 5 µg/L
5. Combined concentration = 95 µg/L = C_t

$$C_t = (Q_e C_e + Q_r C_r) / (Q_r + Q_e)$$

$$C_e = [C_t(Q_r + Q_e) - Q_r C_r] / Q_e = [95 \mu\text{g/L}(0.2 \text{ cfs} + 0.000542 \text{ cfs}) - 0.2 \text{ cfs} \times 90 \mu\text{g/L}] / 0.000542 \text{ cfs} = 1.9 \text{ mg/L}$$

The wasteload allocation = 1.9 mg/L x 1324 L/d = 2.52 g/d. Round up to 3 g/d.

The 2001 Tualatin Basin TMDL did not give O-C a wasteload allocation. This suggests that their discharge of phosphorus could be considered de minimus. This discussion has become moot because O-C changed their boiler conditioning chemical to one which does not contain phosphate. They are now phosphate free as of the end of December 2006. In addition, they have installed an evaporator which went on line in December 2006. A full wood-fired biomass system which will evaporate all the process wastewater generated by the boiler system is scheduled to be operational in late summer of 2007. Once it is operational, the old boiler and new boiler will be decommissioned. That should eliminate the need for some of the currently required monitoring. The old boiler humidistat will still be operational.

340-041-0053

Mixing Zones

(1) The Department may allow a designated portion of a receiving water to serve as a zone of dilution for wastewaters and receiving waters to mix thoroughly and this zone will be defined as a mixing zone;

Conclusion. This permit continues a regulatory mixing zone (RMZ) with the following dimensions:

The Tualatin TMDL assumes a zone of dilution for temperature using one-quarter of the 7Q10 flowrate for McKay Creek. The Department modeled the fate of alkalinity using ambient mixing methods described in the Technical Support Document for Water Quality-Based Toxics Control (1993). Even with low flow conditions, the flow in McKay Creek provides sufficient dilution with a small mixing zone. The mixing zone for alkalinity will also use one-quarter of the 7Q10 flowrate but will terminate 10 feet downstream of the points where discharges enter McKay Creek. No mixing zone is necessary for other pollutants.

COMPLIANCE HISTORY

As stated above a Notice of Noncompliance was issued in February 2005 and a Warning Letter in June 2005. There have been several reported instances of non-compliances in

2006. I inspected the facility on 15 February 2006, discussed sampling with Chris Mackin, Purchasing Manager, and concluded the following:

1. Sampling for chemical parameters has been done since the permit was first issued at sampling ports on the two boilers.
2. Temperature and pH sampling have always been done at the locations called out in the permit as Outfall 001 and Outfall 004 in the original permit.
3. Because of a change in personnel about a year ago, the chemical parameters have since then been sampled at the same location as the temperature. I believe that this has led to erroneous exceedances for which I issued a Notice of Noncompliance in February 2005 and a Warning Letter in June 2005.

For this renewal, the outfall locations have been reconsidered and agreed upon and are described above and in Schedule A.

PROPOSED PERMIT

The proposed permit is attached. The Tualatin TMDL includes a zone of dilution for temperature. This was incorporated into the permit as well as a mixing zone for alkalinity. The sampling compliance points have been clarified.