



STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

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June 19, 2012

12-NWP-090

Mr. Matthew S. McCormick, Manager
United States Department of Energy
Richland Operations Office
PO Box 550, MSIN: A7-50
Richland, Washington 99352

Re: *State Waste Discharge Permit ST0004502* (200 Area Treated Effluent Disposal Facility)

Dear Mr. McCormick:

The Department of Ecology is pleased to transmit the enclosed *State Waste Discharge Permit ST0004502* to the U.S. Department of Energy, Richland Operations Office. This permit provides the terms and conditions that will regulate the discharge of treated wastewater to the infiltration ponds at the 200 Area Treated Effluent Disposal Facility. The *Fact Sheet for State Waste Discharge Permit ST0004502* is also enclosed. This permit will remain in effect from July 1, 2012 to June 30, 2017.

If you or your staff has any questions, please contact Stacy Nichols at (509) 372-7917 or snic461@ecy.wa.gov.

Sincerely,

Jane A. Hedges
Program Manager,
Nuclear Waste Program

Enclosures (2)
sn/jvs

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Issuance Date: 06/25/2012
Effective Date: 07/01/2012
Expiration Date: 06/30/2017

State Waste Discharge Permit Number ST0004502

State of Washington
DEPARTMENT OF ECOLOGY
Olympia, Washington 98504-7600.

Nuclear Waste Program
3100 Port of Benton Blvd.
Richland, Washington 99352

In compliance with the provisions of the
State of Washington Water Pollution Control Law
Chapter 90.48 Revised Code of Washington, as amended,

United States Department of Energy
Richland Operations Office
P.O. Box 550
Richland, Washington 99352

is authorized to discharge wastewater in accordance with the special and general conditions which follow.

Facility Location: 200 East Area and 200 West Area	Discharge Location: 200 Area Treated Effluent Disposal Facility (TEDF), consisting of two adjacent five acre infiltration/disposal basins. Legal Description : S5, T12N, R27E
Treatment Type: System collects, conveys, and disposes of treated effluent from various facilities in the 200 Areas of the Hanford Site. Industry Type: Clean-up Site	SIC Code: 4959 NAICS Code: 562910


Jane A. Hedges
Program Manager
Nuclear Waste Program
Washington State Department of Ecology

The 200 Area Treated Effluent Disposal Facility (TEDF) provides a collection, conveyance, and disposal system for treated effluent from the Waste Treatment Plant and buildings in the 200 East and West Areas of the Hanford Site. It is located in the 200 East and West Areas and consists of a 12-mile-long pipeline, three lift stations, a sample station (Building 6653), and two adjacent five-acre infiltration ponds. All of the water is generated from facility activities that do not have direct contact with industrial processes. The permit provides the terms and conditions that regulate the discharge of treated wastewater, via infiltration through soils, into groundwater of the state.

This permit authorizes the following discharges to the 200 Area TEDF:

Facility	Uses Generating Effluent
Plutonium Finishing Plant	Ventilation heating/cooling, steam condensate, cooling water, compressed air production, process water, rainwater, potable water overflow, and miscellaneous water from deactivation, dismantling, and maintenance activities.
222-S Laboratory Complex	Potable water and rainwater
T Plant	Steam condensate, cooling water, heating coil water, and floor drains
242-A Evaporator	Cooling water and steam condensate
242-A-81 Water Services Building	Untreated Columbia river water and strainer backwash
Waste Encapsulation Storage Facility (WESF)	Cooling water, rainwater, raw water, and potable water
Package boilers (242-A Annex, 283E, and 283W)	Boiler blowdown, steam condensate, cooling water, and water softener regenerate flows
241-A Tank Farm Cooling Water	Cooling water
Miscellaneous waste streams permitted by ST-4511	Miscellaneous waste streams (hydrotest, maintenance, construction, and cooling water, industrial stormwater, etc.)
Waste Treatment Plant	Cooling water, steam condensate, boiler blowdown, reverse osmosis brine, non-dangerous, and non-radioactive water.

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Summary of Permit Report Submittals

Refer to the Special and General Conditions of this permit for additional submittal requirements.

Permit Section	Submittal	Frequency	First Submittal Date
S3.A	Discharge Monitoring Report	Quarterly	30 days after completion of monitoring period
S3.E	Permit Violation Reports	As necessary	Within 5 days upon discovery of a noncompliance, or such other time as may be agreed to by Ecology
S4.A	Operations and Maintenance Manual Update or Review Confirmation Letter	Annually	6/30/2012
S4.B	Bypasses Reports	As necessary	
S6	Application for Permit renewal	1/permit cycle	6/30/2016
S8	Non-Routine Discharge Report	As necessary	
S9	Sampling and Analysis Plan (SAP) and Statistical Evaluation Plan for Effluent Variability Study	Once per Significant New Source	March 1, 2013
S9	Effluent Variability Study Results	Quarterly	30 days after completion of monitoring period
S9	Effluent Variability Study Results Report	Once per Significant New Source	Within one year of completing sampling conducted under the SAP and Statistical Evaluation Plan for Effluent Variability Study
G1	Notice of Change in Authorization	As necessary	
G4	Permit Application for Substantive Changes to the Discharge	As necessary	
G5	Engineering Report for Construction or Modification Activities	As necessary	
G7	Notice of Permit Transfer	As necessary	
G8	Payment of Fees	As assessed	
G10	Duty to Provide Information	As necessary	

Special Conditions

S1. Discharge limits

S1.A. Effluent limits

All discharges and activities authorized by this permit must comply with the terms and conditions of this permit. The discharge of any of the following pollutants more frequently than or at a concentration in excess of that authorized by this permit violates the terms and conditions of this permit. Wastewater flows must not exceed the Design Criteria specified in Section S7.

Beginning on 07/01/2012 and lasting through 06/30/2017, the Permittee is authorized to discharge process wastewater to infiltration ponds at the permitted location subject to the following limits:

Effluent Limits: Sample Station # 6653		
Parameter	Average Monthly ^a	Maximum Daily ^b
Flow ^c	5.5 million gallons/day (MGD)	
Bis (2-ethylhexyl) phthalate	10 µg/l	---
Total Trihalomethane	20 µg/l	---
Carbon Tetrachloride	5 µg/l	---
Chloroform	7 µg/l	---
Methylene Chloride	5 µg/l	---
Arsenic (total)	15 µg/l	---
Cadmium (total)	5 µg/l	---
Chromium (total)	20 µg/l	---
Iron (total)	300 µg/l	---
Manganese (total)	50 µg/l	---
Mercury (total)	2 µg/l	---
Lead	10 µg/l	---
Chloride	58 mg/l	116 mg/l
Nitrate (as N)	0.62 mg/l	1.24 mg/l

Effluent Limits: Sample Station # 6653		
Total Dissolved Solids	500 mg/l	---
a	Average monthly effluent limit means the highest allowable average of daily discharges over a calendar month. To calculate the discharge value to compare to the limit, add the value of each daily discharge measured during a calendar month and divide this sum by the total number of daily discharges measured.	
b	Maximum daily effluent limit means the highest allowable daily discharge. The daily discharge means the discharge of a pollutant measured during a calendar day.	
c	Ecology uses the flow data submitted in the approved engineering report and as included in the Facility Loading Condition (S7) to set permit fees. (WAC 173-224-040(2)(h)).	

S2. Monitoring requirements

S2.A. Process wastewater monitoring

The Permittee must monitor the process wastewater when discharging to the infiltration basins. Samples are collected from Sample Station 6653.

The Permittee must monitor the wastewater according to the following schedule. The Permittee must use the specified analytical methods unless the method used produces measurable results in the sample and EPA has listed it as a Part 136 EPA-approved method or the method is accredited by the Department of Ecology. If the Permittee uses an alternative method, not specified in the permit and as allowed above, it must report the test method, DL, and QL on the discharge monitoring report or in the required report.

Parameter	Units	Laboratory Method	Quantitation Level (QL)	Sampling Frequency	Sample Type
Final Wastewater Effluent					
Flow	Million Gallons per day (MGD)	Calibrated Devices	N/A	Continuous ^a	Continuous
Bis (2-ethyhexyl) phthalate	Micrograms per liter (µg/l)	SW-846 8270 or 625	5.0 µg/l	Quarterly ^d	Grab ^b
Total Trihalomethanes	µg/l	SW-846 8260	10 µg/l	Quarterly	Grab
Carbon Tetrachloride	µg/l	SW-846 8260,	5.0 µg/l	Quarterly	Grab
Chloroform	µg/l	SW-846 8260	5.0 µg/l	Quarterly	Grab
Methylene Chloride	µg/l	SW-846 8260	5 µg/l	Quarterly	Grab
Oil & Grease	mg/l (milligrams per liter)	EPA 1664	5 mg/l	Quarterly	Grab
Tritium	Picocuries per liter (pCi/l)	LA 218-413	N/A	Quarterly	Grab
Gross Alpha	pCi/l	LA 548-401	N/A	Monthly	Grab
Gross Beta	pCi/l	LA 548-401	N/A	Monthly	Grab
Arsenic (total)	µg/l	EPA 200.8	2.0 µg/l	Monthly	24-Hour Composite ^c
Cadmium (total)	µg/l	EPA 200.8	0.5 µg/l	Monthly	24-Hour Composite
Chromium (total)	µg/l	EPA 200.8	1.0 µg/l	Monthly	24-Hour Composite
Iron (total)	µg/l	SW-846 6010	100 µg/l	Monthly	24-Hour Composite
Lead (total)	µg/l	EPA 200.8	0.5 µg/l	Monthly	24-Hour Composite
Manganese (total)	µg/l	EPA 200.8	1.0 µg/l	Monthly	24-Hour Composite
Mercury (total)	µg/l	EPA 200.8	1.0 µg/l	Monthly	24-Hour Composite
Chloride	mg/l	EPA 300.0	1 mg/l	Monthly	24-Hour Composite
Nitrate (as N)	mg/l	EPA 300.0	0.1 mg/l	Monthly	24-Hour Composite
Sulfate	mg/l	EPA- 300.0	.50 mg/l	Monthly	24-Hour Composite

Parameter	Units	Laboratory Method	Quantitation Level (QL)	Sampling Frequency	Sample Type
Total Dissolved Solids	mg/l	SM-2540C (EPA-600 160.1)	10 mg/l	Monthly	24-Hour Composite
pH	Standard Units	SM4500-H ⁺ B	N/A	Continuous	Continuous ^e
Conductivity	µmhos/cm	SM 2510B (EPA 120.1)	N/A	Continuous	Continuous
a		Continuous means uninterrupted except for brief lengths of time for calibration, for power failure, or for unanticipated equipment repair or maintenance. Samples must be taken daily when continuous monitoring is not possible.			
b		Grab means an individual sample collected over a fifteen (15) minute, or less, period.			
c		24 Hour Composite means a 24-hour flow proportional composite. If the pump will not operate continuously for 24 hours due to low flow at the discharge, then a grab sample may be used in place of a composite sample for all parameters that normally require a composite.			
d		Quarterly sampling periods are January through March, April through June, July through September, and October through December.			
e		The Permittee must report the instantaneous maximum and minimum pH daily. Do not average pH values.			

Where the laboratory MDL meets the QL in the above table, the laboratory MDL may be used as a substitute for the QL.

Report single analytical values below detection as "< (detection level)".

Report single analytical values between the detection and quantitation levels with qualifier code of j following the value.

To calculate the average value (monthly average):

- Use the reported numeric value for all parameters measured between the detection value and the quantitation value.
- For values reported below detection, use one-half the detection value if the lab detected the parameter in another sample for the reporting period.
- For values reported below detection, use zero if the lab did not detect the parameter in another sample for the reporting period.

S2.C. Effluent Variability Study Monitoring

The Permittee will monitor the effluent variability new source discharges as identified in Special Condition S.9 and according to the following schedule. The Permittee must use the specified analytical methods unless the method used produces measurable results in the sample and EPA has listed it as a Part 136 EPA-approved method or the method is accredited by the Department of Ecology. If the Permittee uses an alternative method, not specified in the permit and as allowed above, it must report the test method, DL, and QL on the discharge monitoring report or in the required report.

Parameter	Units	Laboratory Method	Quantitation Level (QL)	Sampling Frequency	Sample Type
Oil and Grease	mg/l	EPA 1664	5.0 mg/l	5/month	Grab
Total Trihalomethanes	µg/l	SW-846 8260	10 µg/l	5/month	Grab
Carbon Tetrachloride	µg/l	SW-846 8260	5.0 µg/l	5/month	Grab
Chloroform	µg/l	SW-846 8260	5.0 µg/l	5/month	Grab
Methylene Chloride	µg/l	SW-846 8260	5 µg/l	5/month	Grab
Bis (2-ethylhexyl) phthalate	µg/l	SW-846-8270 or 625	5.0 µg/l	Weekly	Grab
Total Dissolved Solids	mg/l	SM-2540C (EPA-600 160.1)	10 mg/l	Weekly	Composite ^a
Chloride	mg/l	EPA 300.0	1.0 mg/l	Weekly	Composite ^a
Sulfate	mg/l	EPA 300.0	.500 mg/l	Weekly	Composite ^a
Nitrate (as N)	mg/l	EPA 300.0	.10 mg/l	Weekly	Composite ^a
Arsenic (total)	µg/l	EPA 200.8	2.0 µg/l	Weekly	Composite ^a
Cadmium (total)	µg/l	EPA200.8	0.5 µg/l	Weekly	Composite ^a

Parameter	Units	Laboratory Method	Quantitation Level (QL)	Sampling Frequency	Sample Type
Chromium (total)	µg/l	EPA200.8	1.0 µg/l	Weekly	Composite ^a
Iron (total)	µg/l	SW-846 6010	100 µg/l	Weekly	Composite ^a
Lead (total)	µg/l	EPA 200.8	0.5 µg/l	Weekly	Composite ^a
Manganese (total)	µg/l	EPA 200.8	1.0 µg/l	Weekly	Composite ^a
Mercury (total)	µg/l	EPA 200.8	1.0 µg/l	Weekly	Composite ^a
pH	Standard Units	SW-846 9040/EPA 150.1 or SM4500-H ⁺ B	N/A	Continuous	Continuous
Conductivity	µmhos/cm	SW-846 9050/EPA 120.1	N/A	Continuous	Continuous
Flow	million gallons per day (MGD)	N/A	N/A	Continuous	Continuous

a If the collection of flow-composited samples is not possible, grab samples may be substituted for composite samples.

Grab Sample Type means a sample collected in less than 15 minutes.

Composite Sample Type means a 24-hour flow proportional composite. If the pump will not operate continuously for 24 hours due to low flow at the discharge, then a grab sample may be used in place of a composite sample for all parameters that normally require a composite.

Continuous means uninterrupted except for brief lengths of time for calibration, for power failure, or for unanticipated equipment repair or maintenance. Samples must be taken daily when continuous monitoring is not possible.

5/month Frequency means 5 grab samples shall be collected during each calendar month.

Weekly Frequency means once per calendar week.

S2.D. Sampling and analytical procedures

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

Sampling and analytical methods used to meet the water and wastewater monitoring requirements specified in this permit must conform to the latest revision of the following rules and documents unless otherwise specified in this permit or approved in writing by the Department of Ecology (Ecology).

- Guidelines Establishing Test Procedures for the Analysis of Pollutants contained in 40 CFR Part 136
- Standard Methods for the Examination of Water and Wastewater (APHA).

S2.E. Flow measurement, field measurement and continuous monitoring devices

The Permittee must:

1. Select and use appropriate flow measurement, field measurement, and continuous monitoring devices and methods consistent with accepted scientific practices. Continuous monitoring devices include Flow Meter FE-68C-003, Flow Transmitter FT-68C-003, pH Meter AE-68C-012, pH Transmitter AIT-68C-012, Conductivity Meter AE-68C-011, and Conductivity Transmitter AIT-68C-011.
2. Install, calibrate, and maintain these devices to ensure the accuracy of the measurements is consistent with the accepted industry standard and the manufacturer's recommendation for that type of device.
3. Calibrate continuous pH and conductivity monitoring instruments weekly unless it can demonstrate a longer period is sufficient based on monitoring records.
4. Use field measurement devices as directed by the manufacturer and do not use reagents beyond their expiration dates unless the reagent is requalified.
5. Calibrate these devices at the frequency recommended by the manufacturer.
6. Calibrate flow monitoring devices at a minimum frequency of at least one calibration per year.
7. Maintain calibration records for at least three years.

S2.F. Laboratory accreditation

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

S2.G. Request for reduction in monitoring

The Permittee may request a reduction of the sampling frequency after twelve (12) months of monitoring. Ecology will review each request and at its discretion grant the request when it reissues the permit or by a permit modification.

The Permittee must:

1. Provide a written request.
2. Clearly state the parameters for which it is requesting reduced monitoring.
3. Clearly state the justification for the reduction.

S3. Reporting and recordkeeping requirements

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

S3.A. Reporting

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

1. Summarize, report, and submit monitoring data obtained during each monitoring period on a Discharge Monitoring Report (DMR) form provided, or otherwise approved, by Ecology. Include a summary listing daily results for the parameters tabulated in Special Condition S2, including MDLs and QLs (when applicable). If submitting DMRs electronically, report a value for each day sampling occurred and for the summary values (when applicable) included on the form.
2. Submit the form as required with the words "no discharge" entered in place of the monitoring results, if the facility did not discharge during a given monitoring period. If submitting DMRs electronically, you must enter "no discharge" for an entire DMR, for a specific monitoring point, or for a specific parameter as appropriate.
3. Report the test method, DL, and QL on the discharge monitoring report or in the required report, if the Permittee used an alternative method not specified in the permit.
4. Include the following information (for priority pollutant organic and metal parameters lab reports): sampling date, sample location, date of analysis, parameter name, CAS number, analytical method/number, method detection limit (MDL), laboratory practical quantitation limits (PQL), reporting units, and concentration detected. The Permittee must submit a copy of the contract laboratory report to provide this information. Analytical results from samples sent to a contract laboratory must also include information on the chain of custody, QA/QC results, and documentation of accreditation for the parameter. If the Permittee submits electronic DMRs, then it must attach an electronic file of the lab report to the electronic DMR.
5. Ensure that DMR forms are postmarked or received by Ecology no later than the dates specified below, unless otherwise specified in this permit. If submitting DMRs electronically, submit the DMR no later than the dates specified below, unless otherwise specified in this permit.

6. Submit DMRs for parameters with the monitoring frequencies specified in S2 (daily, monthly, quarterly, annually, etc.) at the reporting schedule identified below. The Permittee must:
 - a. Submit **DMRs**, unless otherwise specified in the permit, within 30 days of the completed monitoring period. Quarterly sampling periods are January through March, April through June, July through September, and October through December.
7. Submit reports to Ecology online using Ecology's electronic DMR submittal forms or send reports to Ecology at:

Water Quality Permit Coordinator
Department of Ecology
3100 Port of Benton Blvd.
Richland, Washington 99354

S3.B. Records retention

The Permittee must retain records of all monitoring information for a minimum of three (3) years. Such information must include all calibration and maintenance records and all original recordings and electronic data for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit. The Permittee must extend this period of retention during the course of any unresolved litigation regarding the discharge of pollutants by the Permittee or when requested by Ecology.

The Permittee must retain all records pertaining to the monitoring of sludge for a minimum of five (5) years.

S3.C. Recording of results

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

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

S3.D. Additional monitoring by the Permittee

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

S3.E. Reporting permit violations

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

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

a. Twenty-four-hour reporting

The Permittee must report the following occurrences of noncompliance by telephone, to Ecology at 509-372-7950, within twenty four (24) hours from the time the Permittee becomes aware of any of the following circumstances. The Permittee must report:

1. Any noncompliance that may endanger health or the environment, unless previously reported under immediate reporting requirements.
2. Any unanticipated bypass that causes an exceedance of an effluent limit in the permit (See Part S4.B., "Bypass Procedures").
3. Any upset that causes an exceedance of an effluent limit in the permit. Upset means an exceptional incident in which there is unintentional and temporary noncompliance with technology-based permit effluent limits 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, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.
4. Any violation of a maximum daily or instantaneous maximum discharge limit for any of the pollutants in Section S1.A of this permit.
5. Any overflow prior to the treatment works, whether or not such overflow endangers health or the environment or exceeds any effluent limit in the permit.
6. Any leak or failure of the wastewater transmission pipeline distribution system.

b. Report within five days

The Permittee must also provide a written submission within five (5) days of the time that the Permittee becomes aware of any event it must report under subpart a, above. The written submission must contain:

1. A description of the noncompliance and its cause.
2. Maps, drawings, aerial photographs, or pictures to show the location and cause(s) of the non-compliance.
3. The period of noncompliance, including exact dates and times.
4. The estimated time the Permittee expects the noncompliance to continue, if not yet corrected.
5. Steps taken or planned to reduce, eliminate, and prevent recurrence of the noncompliance.

6. If the noncompliance involves an overflow prior to the treatment works, an estimate of the quantity (in gallons) of untreated overflow.

c. Waiver of written reports

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

d. All other permit violation reporting

The Permittee must report all permit violations, which do not require immediate or within twenty four (24) hours reporting, when it submits monitoring reports for S3.A ("Reporting"). The reports must contain the information listed in subpart c, above. Compliance with these requirements does not relieve the Permittee from responsibility to maintain continuous compliance with the terms and conditions of this permit or the resulting liability for failure to comply.

e. Report submittal

The Permittee must submit reports to the address listed in S3A.

S3.F. Other reporting

The Permittee must report a spill of oil or hazardous materials in accordance with the requirements of RCW 90.56.280. Further instructions can be obtained at the following website: <http://www.ecy.wa.gov/programs/spills/other/reportaspill.htm> .

Where the Permittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application, or in any report to Ecology, it must submit such facts or information promptly.

S3.G. Maintaining a copy of this permit

The Permittee must keep a copy of this permit at the facility and make it available upon request to Ecology inspectors.

S4. Operation and maintenance

The Permittee must, at all times, properly operate and maintain all facilities or systems of treatment and control (and related appurtenances) which are installed to achieve compliance with the terms and conditions of this permit. Proper operation and maintenance includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems, which are installed by a Permittee only when the operation is necessary to achieve compliance with the conditions of this permit.

S4.A. Operations and maintenance (O&M) manual

a. O&M manual submittal and requirements

The Permittee must:

1. Review the O&M Manual at least annually and confirm this review by letter to Ecology by June 30 of each year.
2. Submit to Ecology substantial changes or updates to the O&M Manual whenever they incorporate them into the manual. The Permittee must submit a paper copy and an electronic copy (preferably as a PDF).
3. Keep the O&M Manual at the permitted facility.
4. Follow the instructions and procedures of this manual.

b. O&M manual components

In addition to the requirements of WAC 173-240-150 (1) through (2), the O&M Manual must include:

1. Emergency procedures for plant shutdown and cleanup in the event of a wastewater system upset or failure including pipeline leaks.
2. Wastewater system maintenance procedures that contribute to the generation of wastewater.
3. Any directions to maintenance staff when cleaning, or maintaining other equipment or performing other tasks which are necessary to protect the operation of the wastewater system (for example, defining maximum allowable discharge rate for draining a tank, blocking all floor drains before beginning the overhaul of a stationary engine).
4. Treatment plant process control monitoring schedule.
5. Wastewater sampling protocols and procedures for compliance with the sampling and reporting requirements in the wastewater discharge permit.
6. Minimum staffing adequate to operate and maintain the treatment processes and carry out compliance monitoring required by the permit.

S4.B. Bypass procedures

The Permittee must immediately notify Ecology of any spill, overflow, or bypass from any portion of the system.

In order to prevent possible problems in the collection system, the use of the overflow pipeline that discharges to the C lobe of the 216-B-3 Pond Complex is authorized by this permit. This overflow pipeline is for emergency overflow only, such as failure of the booster pumps.

Conditions for authorized overflows to the C lobe are as follows:

1. The overflow system must include an alarm that immediately notifies operators of an overflow condition. If an overflow occurs, then immediate action is required to reduce the flow in order to stop the overflow. This immediate action may include ordering the shutdown of the 242-A Evaporator or the shutdown of other major flow contributors.
2. The Permittee must collect a grab sample representative of the overflow for any overflow that continues for over one hour. The representative sample must be analyzed for the permit parameters listed in Special Condition S2. Any overflow that lasts over an hour and is not

sampled will be considered a violation of this permit for all permit parameters. The analytical results of an overflow must be reported to Ecology within 60 days of sample collection.

3. No overflow may last over five hours. Any overflows that exceed five (5) hours will be considered a violation of this permit.
4. No more than four overflows are authorized in any twelve (12) month period. Each overflow in excess of four (4) in a twelve (12) month period will be considered a violation of this permit.
5. The number of overflows per month must be reported on the Discharge Monitoring Reports.

Except for discharges to the C lobe of the 216-B-3 Pond Complex authorized by this Permit, a bypass is prohibited when it is the intentional diversion of waste streams from any portion of the treatment facility other than the overflow pipeline. Ecology may take enforcement action against a Permittee for such bypass unless one of the following circumstances (1, 2, or 3) applies.

1. Bypass for essential maintenance without the potential to cause violation of permit limits or conditions.
This permit authorizes a bypass if it allows for essential maintenance and does not have the potential to cause violations of limits or other conditions of this permit, or adversely impact public health as determined by Ecology prior to the bypass. The Permittee must submit prior notice, if possible, at least ten (10) days before the date of the bypass.
2. Bypass is unavoidable, unanticipated, and results in noncompliance of this permit.
This permit authorizes such a bypass only if:
 - a. Bypass is unavoidable to prevent loss of life, personal injury, or severe property damage. "Severe property damage" means substantial physical damage to property, damage to the treatment facilities which would cause them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass.
 - b. No feasible alternatives to the bypass exist, such as:
 - The use of auxiliary treatment facilities.
 - Retention of untreated wastes.
 - Stopping production.
 - Maintenance during normal periods of equipment downtime, but not if the Permittee should have installed adequate backup equipment in the exercise of reasonable engineering judgment to prevent a bypass.
 - Transport of untreated wastes to another treatment facility or preventative maintenance, or transport of untreated wastes to another treatment facility.
 - c. The Permittee has properly notified Ecology of the bypass as required in Condition S3.E of this permit.
3. If bypass is anticipated and has the potential to result in noncompliance of this permit.
 - a. The Permittee must notify Ecology at least thirty (30) days before the planned date of bypass. The notice must contain:

- A description of the bypass and its cause.
 - An analysis of all known alternatives which would eliminate, reduce, or mitigate the need for bypassing.
 - A cost-effectiveness analysis of alternatives including comparative resource damage assessment.
 - The minimum and maximum duration of bypass under each alternative.
 - A recommendation as to the preferred alternative for conducting the bypass.
 - The projected date of bypass initiation.
 - A statement of compliance with SEPA.
 - A request for modification of water quality standards as provided for in WAC 173-201A-410, if an exceedance of any water quality standard is anticipated.
 - Details of the steps taken or planned to reduce, eliminate, and prevent reoccurrence of the bypass.
- b. For probable construction bypasses, the Permittee must notify Ecology of the need to bypass as early in the planning process as possible. The Permittee must consider the analysis required above during preparation of the engineering report or facilities plan and plans and specifications and must include these to the extent practical. In cases where the Permittee determines the probable need to bypass early, the Permittee must continue to analyze conditions up to and including the construction period in an effort to minimize or eliminate the bypass.
- c. Ecology will consider the following prior to issuing an administrative order for this type of bypass:
- If the bypass is necessary to perform construction or maintenance-related activities essential to meet the requirements of this permit.
 - If feasible alternatives to bypass exist, such as the use of auxiliary treatment facilities, retention of untreated wastes, stopping production, maintenance during normal periods of equipment down time, or transport of untreated wastes to another treatment facility.
 - If the Permittee planned and scheduled the bypass to minimize adverse effects on the public and the environment.

After consideration of the above and the adverse effects of the proposed bypass and any other relevant factors, Ecology will approve or deny the request. Ecology will give the public an opportunity to comment on bypass incidents of significant duration, to the extent feasible. Ecology will approve a request to bypass by issuing an administrative order under RCW 90.48.120.

S4.C. Best management practices/pollution prevention program

The Permittee must comply with the following Best Management Practices to prevent pollution to waters of the State:

1. Do not comingle process wastewater streams with sanitary (domestic) sewage.
2. Do not discharge in excess of the hydraulic capacity of the evaporation/ infiltration ponds so that the pond overflows.

3. Do not discharge priority pollutants, dangerous wastes, or toxics in toxic amounts.
4. Wastewater from the infiltration basins must not run off into any surface waters of the state or to any land not owned by or under control of the Permittee.
5. The Permittee must use recognized good practices, and all available and reasonable procedures.
6. Do not apply wastewater to the infiltration basins in quantities that significantly reduce or destroy the long-term infiltration rate of the soil or that would alter groundwater quality in amounts that would affect current and future beneficial uses.

S5. Solid wastes

S5.A. Solid waste handling

The Permittee must handle and dispose of all solid waste material in such a manner as to prevent its entry into state ground or surface water.

S5.B. Leachate

The Permittee must not allow leachate from its solid waste material to enter state waters without providing all known, available, and reasonable methods of treatment, nor allow such leachate to cause violations of the State Surface Water Quality Standards, Chapter 173-201A WAC, or the State Ground Water Quality Standards, Chapter 173-200 WAC. The Permittee must apply for a permit or permit modification as may be required for such discharges to state ground or surface waters.

S6. Application for permit renewal or modification for facility changes

The Permittee must submit an application for renewal of this permit at least one (1) year prior to the expiration date of the current permit. The Permittee must submit a paper copy and an electronic copy (preferably as a PDF).

The Permittee must also submit a new application or supplement at least one hundred eighty (180) days prior to commencement of discharges which may result in permit violations. Activities which may result in such discharges include facility expansions, production increases, or other planned changes, such as process modifications in the permitted facility.

S7. Facility loading

S7.A. Design criteria

The flows or waste loads for the permitted facility must not exceed the following design criteria:

Average Monthly Flow 5.5 million gallons per day

Average Yearly Flow 1.7 million gallons per day

The average monthly flow is defined as the highest allowable average of the daily discharges over a calendar month, calculated as the total gallons discharged during a calendar month, divided by the number of days in that month. The average yearly flow is defined as the highest allowable average of

the daily discharges over a calendar year, calculated as the total gallons discharged during a calendar year, divided by the number of days in that year.

S8. Non-routine and unanticipated discharges

Beginning on the effective date of this permit, the Permittee is authorized to discharge non-routine wastewater on a case-by-case basis if approved by Ecology. Prior to any such discharge, the Permittee must contact Ecology and at a minimum provide the following information:

- a. The proposed discharge location
- b. The nature of the activity that will generate the discharge
- c. Any alternatives to the discharge, such as reuse, storage, or recycling of the water
- d. The total volume of water it expects to discharge
- e. The results of the chemical analysis of the water
- f. The date of proposed discharge
- g. The expected rate of discharge in gallons per minute

The Permittee must analyze the water for all constituents limited for the discharge and report them as required by S8.e. above. The Permittee must also analyze for hardness and any metals that are limited by water quality standards. The analysis must also include any parameter deemed necessary by Ecology. All discharges must comply with the effluent limits as established in Condition S1 of this permit, water quality standards, and any other limits imposed by Ecology.

The Permittee must limit the discharge rate, as referenced in S8.g. above, so it will not cause erosion of ditches or structural damage to culverts and their entrances or exits.

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

S9. Effluent Variability Study

Within sixty (60) days of the effective date of this permit, the Permittee must submit a proposed Sampling and Analysis Plan (SAP) and Statistical Evaluation Plan to determine the variability in the effluent resulting from the significant new source discharges from the Waste Treatment Plant (WTP) facility. The Permittee must determine such statistical evaluators (or their equivalent) as the average mean concentrations, upper 95% confidence intervals, standard deviations, and coefficients of variation. A variability study is required whenever there is a Significant New Source of discharge to the 200 Area TEDF. A Significant New Source is a new discharge to 200 Area TEDF, which may not be fully characterized through sample analysis or process knowledge and may have a measurable impact on the 200 Area TEDF effluent. The Permittee must contact Ecology when it identifies a significant new

source discharge. If the Permittee is not certain if a new discharge is a Significant New Source, contact Ecology for a determination.

The Permittee must conduct the variability study in at least two seasonal phases (winter and summer) during initial testing and the first year of WTP operational discharges to TEDF. In developing the study plan, the Permittee must also consider any facility operational changes that might contribute to waste stream variability. The Permittee must conduct the study during initial testing and for one (1) year or as long as needed to evaluate all WTP significant discharges to TEDF.

The Permittee must:

1. Collect at least five (5) randomly collected grab samples per month and analyze the samples as specified in Special Condition S2.C and its schedule.
2. Analyze weekly flow-composited samples as specified in Special Condition S2.C.
3. Conduct continuous monitoring for pH, conductivity, and flow.

The Permittee must report the monitoring results for any significant new source discharge quarterly on Discharge Monitoring Reports. It must provide a final summary report with the results of the evaluation and any relevant or new information or recommendations to Ecology within one (1) year of completion of the study. The Permittee may apply to Ecology for a permit modification if the results of the quarterly reporting of monitoring results and/or study provide new information, which it was not aware of when it submitted the original application.

If upon study completion the Permittee believes the monitoring program requirements as required in Permit Special Condition S9 are unnecessarily redundant or too extensive, the Permittee may make a written request to Ecology to reduce the monitoring requirements as per Special Condition S2.G.

GENERAL CONDITIONS

G1. Signatory requirements

All applications, reports, or information submitted to Ecology must be signed as follows:

1. All permit applications must be signed by either a principal executive officer or ranking elected official.
2. All reports required by this permit and other information requested by Ecology must be signed by a person described above or by a duly authorized representative of that person. A person is a duly authorized representative only if:
 - a. The authorization is made in writing by the person described above and is submitted to Ecology at the time of authorization, and
 - b. The authorization specifies either a named individual or any individual occupying a named position.
3. Changes to authorization. If an authorization under paragraph 2.b. above is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization must be submitted to Ecology prior to or together with any reports, information, or applications to be signed by an authorized representative.

4. Certification. Any person signing a document under this section must make the following certification:

"I certify under penalty of law, that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

G2. Right of entry

Representatives of Ecology have the right to enter at all reasonable times in or upon any property, public or private, for the purpose of inspecting and investigating conditions relating to the pollution or the possible pollution of any waters of the state. Reasonable times include normal business hours; hours during which production, treatment, or discharge occurs; or times when Ecology suspects a violation requiring immediate inspection. Representatives of Ecology must be allowed to have access to, and copy at reasonable cost, any records required to be kept under terms and conditions of the permit; to inspect any monitoring equipment or method required in the permit; and to sample the discharge, waste treatment processes, or internal waste streams.

G3. Permit actions

This permit is subject to modification, suspension, or termination, in whole or in part by Ecology for any of the following causes:

1. Violation of any permit term or condition;
2. Obtaining a permit by misrepresentation or failure to disclose all relevant facts;
3. A material change in quantity or type of waste disposal;
4. A material change in the condition of the waters of the state; or
5. Nonpayment of fees assessed pursuant to RCW 90.48.465.

Ecology may also modify this permit, including the schedule of compliance or other conditions, if it determines good and valid cause exists, including promulgation or revisions of regulations or new information.

G4. Reporting a cause for modification

The Permittee must submit a new application at least sixty (60) days before it wants to discharge more of any pollutant, a new pollutant, or more flow than allowed under this permit. The Permittee should use the State Waste Discharge Permit application and submit required plans at the same time. Required plans include an Engineering Report, Plans and Specifications, and an Operations and Maintenance manual, (see Chapter 173-240 WAC). Ecology may waive these plan requirements for small changes. Please contact Ecology if they do not appear necessary. The Permittee must continue to comply with the existing permit until it is modified or reissued. Submitting a notice of dangerous waste discharge (to comply with Pretreatment or Dangerous Waste rules) will trigger this requirement as well.

G5. Plan review required

Prior to constructing or modifying any wastewater control facilities, an engineering report and detailed plans and specifications must be submitted to Ecology for approval in accordance with Chapter 173-240 WAC. Engineering reports, plans, and specifications should be submitted at least one hundred and eighty (180) days prior to the planned start of construction. Facilities must be constructed and operated in accordance with the approved plans.

G6. Compliance with other laws and statutes

Nothing in the permit excuses the Permittee from compliance with any applicable federal, state, or local statutes, ordinances, or regulations.

G7. Transfer of this permit

This permit is automatically transferred to a new owner or operator if:

1. A written agreement between the old and new owner or operator containing a specific date for transfer of permit responsibility, coverage, and liability is submitted to Ecology;
2. A copy of the permit is provided to the new owner and;
3. Ecology does not notify the Permittee of the need to modify the permit.

Unless this permit is automatically transferred according to Section A. above, this permit may be transferred only if it is modified to identify the new Permittee and to incorporate such other requirements as determined necessary by Ecology.

G8. Payment of fees

The Permittee must submit payment of fees associated with this permit as assessed by Ecology. Ecology may revoke this permit if the permit fees established under Chapter 173-224 WAC are not paid.

G9. Penalties for violating permit conditions

Any person who is found guilty of willfully violating the terms and conditions of this permit is guilty of a crime, and upon conviction thereof will be punished by a fine of up to ten thousand dollars and costs of prosecution, or by imprisonment at the discretion of the court. Each day upon which a willful violation occurs may be deemed a separate and additional violation.

Any person who violates the terms and conditions of a waste discharge permit will incur, in addition to any other penalty as provided by law, a civil penalty in the amount of up to ten thousand dollars for each violation. Each and every such violation is a separate and distinct offense, and in the case of a continuing violation, every day's continuance is a separate and distinct violation.

G10. Duty to provide information

The Permittee must submit to Ecology, within a reasonable time, all information which Ecology may request to determine whether cause exists for modifying, revoking, and reissuing, or terminating this permit or to determine compliance with this permit. The Permittee must also submit to Ecology upon request, copies of records required to be kept by this permit.

G11. Duty to comply

The Permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of chapter 90.48 RCW and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or denial of a permit renewal application.

Fact Sheet for State Waste Discharge Permit ST0004502

200 Area Treated Effluent Disposal Facility (TEDF)

October 18, 2011

Purpose of this Fact Sheet

This fact sheet explains and documents the decisions the Department of Ecology (Ecology) made in drafting the proposed State Waste Discharge permit for the 200 Area Treated Effluent Disposal Facility (TEDF) that will allow discharge of wastewater into two adjacent five acre infiltration ponds near the 200 Area of the United States Department of Energy Hanford Site.

State law requires any industrial facility to obtain a permit before discharging waste or chemicals to waters of the state, which includes groundwater.

Ecology makes the draft permit and fact sheet available for public review and comment at least thirty (30) days before issuing the final permit. Copies of the fact sheet and draft permit for the 200 Area TEDF, State Waste Discharge permit ST0004502, are available for public review and comment from October 31, 2011 until the close of business December 28, 2011. For more details on preparing and filing comments about these documents, please see **Appendix A - Public Involvement Information**.

The United States Department of Energy, Richland Operations Office (US DOE-RL) reviewed the draft permit and fact sheet for factual accuracy. Ecology corrected any errors or omissions about the facility's location, history, product type or production rate, discharges or receiving water prior to publishing this draft fact sheet for public notice.

After the public comment period closes, Ecology will summarize substantive comments and our responses to them. Ecology will include our summary and responses to comments to this fact sheet as **Appendix E - Response to Comments**, and publish it when we issue the final State Waste Discharge permit. Ecology will not revise the rest of the fact sheet, but the full document including all appendices will become part of the legal history contained in the facility's permit file.

Summary

Ecology proposes to renew a State Waste Discharge Permit, which will continue to allow discharge of wastewater via infiltration through soils to the groundwater of the state. The Applicant is the United States Department of Energy, Richland Operations Office (USDOE-RL). The disposal facility is called the 200 Area Treated Effluent Disposal Facility. The TEDF is a piped collection system that does not have any treatment or retention capacity. Strict controls at the generating facilities are essential to operate in compliance with the Permit. Requirements and responsibilities for operation of TEDF generators discharging liquid effluents to TEDF are controlled by interface control procedure documents. The facility is located in and near the 200 East and West Areas and consists of a twelve (12)-mile-long pipeline, three lift stations, a sample station (Building 6653), and two adjacent five-acre infiltration ponds. Water in close proximity to the ponds is found as groundwater at a depth of about 140 feet below the surface. The disposal site was selected to avoid potential mobilization of contaminants from historical disposal practices or potential impacts to historical, archaeological, and cultural

resources. Computer modeling of groundwater flow provides an estimated travel time of approximately 120 to 300 years for the effluent to reach the Columbia River.

The public had the opportunity to review the permitting of the disposal facility's effluent under the Washington State Environmental Policy Act (SEPA) in November 1993 and in December 2011. Environmental Checklists were completed. Ecology made determinations of Nonsignificance under SEPA after receiving no comments during the public comment periods.

The effluent consists of individual waste streams from several Hanford facilities. All of these individual waste streams are generated from uses that do not involve direct contact of the water with industrial processes. These uses are primarily those associated with ventilation, heating, and cooling systems for the buildings; steam condensate from heating potable (drinkable) water; condensate of pressurized potable water; rainwater; and untreated Columbia River water. USDOE-RL operates an extensive program of source controls (pollution prevention) to eliminate or reduce approximately 85% of prior contaminant loadings. It has also constructed effluent treatment systems at some of the facilities that discharge to the 200 Area TEDF.

The draft permit complies with the regulatory requirements of Chapter 173-200 of the Washington Administrative Code (WAC) - Water Quality Standards for Ground Waters of the State of Washington. This regulation is premised on the fact that all contaminants should be regulated to protect all existing and future beneficial uses of the groundwater. Since the use of drinking water is the most restrictive and protective, this regulation and the draft permit protects the groundwater for drinking water purposes. The draft permit establishes enforcement limits for nonradioactive contaminants or maximum allowable concentration levels in the effluent and/or groundwater that are essentially drinking water standards. Hence, the permit requires that the effluent meet drinking water standards for nonradioactive contaminants before discharge to the infiltration ponds.

This proposed permit does not cover any radioactivity or radionuclide parameters which are considered to be a source, a byproduct, or special nuclear materials that are controlled by the Department of Energy (DOE) under the Atomic Energy Act (AEA) in accordance with provisions of DOE Order 458.1, "Radiation Protection of the Public and the Environment." DOE-RL will regulate and monitor the release of radionuclides to the environment pursuant to the AEA. DOE-RL plans to meet the intent of 40 CFR Part 141, "National Primary Drinking Water Regulations," in regards to radioactive contaminants, and plans to take investigative and mitigating steps if the discharge exceeds drinking water standards. The facility monitors and reports radionuclide concentrations in the effluent to Ecology. Therefore, gross alpha, gross beta, and tritium are not assigned enforcement limits but are monitored and reported for informational purposes. Proposed changes to this draft permit include:

- Raising the monthly average effluent limit for Total Dissolved Solids from 250 mg/l to 500 mg/l,
- Adding a major waste stream contributor from the Hanford Balance of Facilities/Waste Treatment Plant, and
- Moving the point of compliance for lead and cadmium from the groundwater to the effluent.
- Discontinuing monitoring of the groundwater wells.

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200 Area Treated Effluent Disposal Facility

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I. Introduction

The legislature defined Ecology's authority and obligations for the wastewater discharge permit program in the Water Pollution Control law, chapter 90.48 RCW (Revised Code of Washington).

Ecology adopted rules describing how it exercises its authority:

- State waste discharge program (chapter 173-216 WAC)
- Water quality standards for groundwaters of the state of Washington (chapter 173-200 WAC)
- Submission of plans and reports for construction of wastewater facilities (chapter 173-240 WAC).

These rules require any industrial facility owner/operator to obtain a State Waste Discharge permit before discharging wastewater to state waters. They also help define the basis for limits on each discharge and for performance requirements imposed by the permit.

Under the State Waste Discharge permit program and in response to a complete and accepted permit application, Ecology must prepare a draft permit and accompanying fact sheet, and make it available for public review before final issuance. Ecology must also publish an announcement (public notice) telling people where they can read the draft permit, and where to send their comments, during a period of thirty days. (See **Appendix A-Public Involvement Information** for more detail about the public notice and comment procedures). After the public comment period ends, Ecology may make changes to the draft State Waste Discharge permit in response to comment(s). Ecology will summarize the responses to comments and any changes to the permit in **Appendix E**.

II. Background Information

Table 1 General Facility Information

Facility Information	
Applicant	United States Department of Energy, Richland Operations Office
Facility Name and Address	200 Area Treated Effluent Disposal Facility 200 East Area on the Hanford Site P.O. Box 550 Richland, Washington 99352
Contact at Facility	Name: Mark W. Bowman Telephone #: (509) 376-7395

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Facility Information	
Responsible Official	Name: Matthew S. McCormick Title: Manager, U.S. Department of Energy/Richland Operations Office Address: P.O. Box 550 Richland, Washington 99352 Telephone #: (509) 376-7395 FAX # (509) 376-4789
Industry Type	Clean-up Site
Type of Treatment	System collects, conveys, and disposes of treated effluent from various facilities in the 200 Areas of the Hanford Site.
SIC Codes	4959
NAIC Codes	562910
Facility Location	200 Area of the Hanford Site
Legal Description of Application Area	Section, township, range S5, T12N, R27E

Permit Status	
Renewal Date of Previous Permit	05/18/2000
Application for Permit Renewal Submittal Date	10/08/2003
Date of Ecology Acceptance of Application	12/16/2003

Inspection Status	
Date of Last Sampling Inspection	N/A
Date of Last Non-sampling Inspection Date	06/15/2011

Figure 1 Facility Location Map

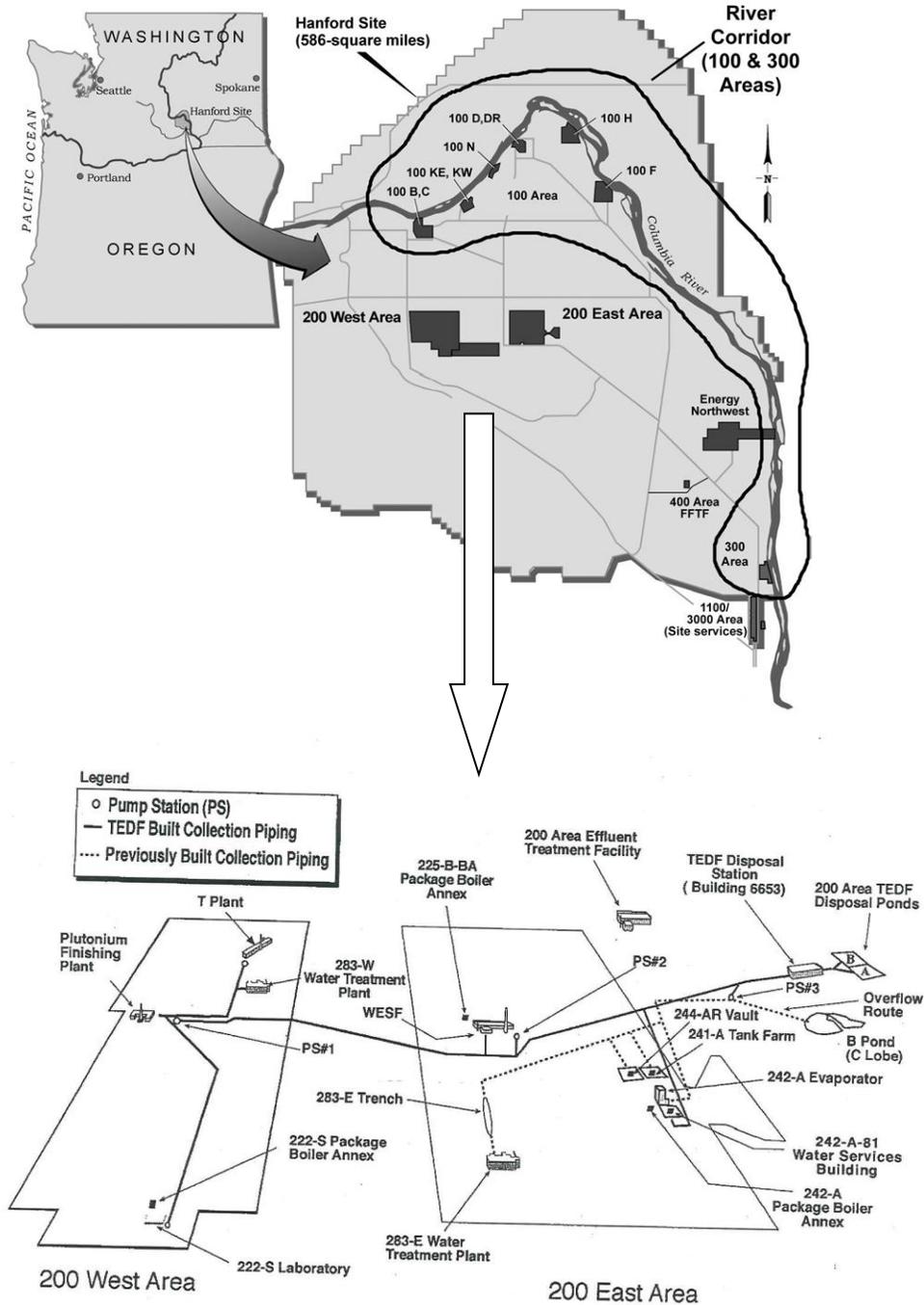


Figure 2 Facility Photos



A Pond
200 Area Treated Effluent Disposal Facility



B Pond
200 Area Treated Effluent Disposal Facility

A. Facility Description

History

As a requirement for obtaining the original State Waste Discharge Permit, the DOE-RL had to eliminate or reduce the contaminant loading in the effluent by applying all known, available, and reasonable methods (AKART) of prevention, control, and treatment prior to its discharge to the environment. In addition, the facility applied AKART to reduce the volume of the effluent. DOE-RL also incorporated this program of pollution prevention, effluent treatment prior to discharge into the 200 Area TEDF system, and facility construction and operation as a portion of Milestone 17 in the 1989 Hanford Federal Facility Agreement and Consent Order (Tri-Party Agreement) between the Department of Energy, the U.S. Environmental Protection Agency, and Ecology. The Tri-Party Agreement further requires that the Best Available Technology (BAT) that is economically achievable be applied to the effluent. An extensive engineering report (WHC-SD-W049H-ER-003, Volumes 1 and 2 as listed in the References) describes all of the source controls, technology improvements, operational changes, and treatment technologies applied at all of the original facilities discharging to the 200 Area TEDF to clean up the effluent and reduce its volume. Compliance inspections conducted by Ecology officials documented the implementation of the required improvements by the facility.

Because of this multi-year effort, the facility reduced the toxic mass of contaminants in the effluent from the original facilities by approximately 85%. It projected a total cost of pollution prevention and disposal of \$20 million. When the TEDF became operational in 1995, the original contributing effluent streams no longer discharged to their prior disposal sites. The TEDF project combined the individual effluent streams from several Hanford facilities, which then discharged to the disposal facility. The facilities originally included were Plutonium Finishing Plant, T Plant, 222-S Laboratory, 284-W Power Plant, B Plant, 242-A-81 Water Services Building, and the PUREX facility. The original permit provided for the addition of a limited quantity of future potential effluent streams, provided they did not contain new contaminants and the discharge met all permit conditions.

During the early years of the operation, the facility added new streams including the W-252 streams in 1997. The W-252 streams included discharges from the 242-A Evaporator, the 241-A Tank Farm Complex, the 284-E Power Plant, the B Plant, and the 244-AR Vault. Controls on the W-252 streams are discussed in the engineering report, "Phase II Liquid Effluent Program (Project W-252) Wastewater Engineering Report and BAT/AKART Studies" (WHC-SD-W252-ER-001, Rev. 0) and in subsequent engineering change notices to the report.

The current lists of facilities, authorized by the existing permit to discharge to 200 Area TEDF, include the following:

- Plutonium Finishing Plant Wastewater
- T Plant Wastewater

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200 Area Treated Effluent Disposal Facility

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- 222-S Laboratory Complex Wastewater
- Waste Encapsulation Storage Facility (WESF) Liquid Effluent and Cooling Water
- 242-A-81 Water Services Wastewater
- 242-A Evaporator Cooling Water
- 242-A Package Boiler Annex Wastewater
- 242-A Evaporator Steam Condensate
- 241-A Tank Farm Cooling Water
- miscellaneous streams covered by State Waste Discharge Permit ST 4511
- Package Boiler locations 283E and 283W
- Discharges from the Hanford Tank Waste Treatment and Immobilization Plant (WTP) located in the 200 East Area

The addition of wastewater from the WTP to 200 Area TEDF is a major new waste stream. Discharges from testing may start as soon as 2012. Startup from cooling towers and discharges from actual operations of the facility may begin in 2015.

Discharges from the WTP include discharges from the:

- Pretreatment Facility
- Water Treatment Building, Analytical Laboratory
- High Level Waste and Low Level Waste Facilities
- Steam Plant Facility, Chiller/Compressor Plant
- Wet Chemical Storage Facility
- Maintenance Shop
- PTF Chiller Plant and Cooling Tower

DOE prepared and submitted a Best Available Technology/All Known and reasonable treatments (BAT/AKART) engineering study specific to the WTP to Ecology in October 2003 (24590-CM-HC4-KKYP-00001-01-02A) as part of the permit application for ST0004502 and to complement the 1992 engineering study (WHC-SD-W049H-ER-003) for the other 200 Area facilities. The WTP study recommended a source control that included the use of a reverse osmosis (RO) unit for production of demineralized water for steam production and other plant processes, as well as operation of the cooling towers at an average of five cycles of concentration. The WTP study concluded that the treatment facility will meet the effluent limits of the ST0004502 permit with the exception of total dissolved solids (TDS). The report recommended that Ecology increase the monthly average limit for TDS in the ST0004502 permit from 250 mg/l to 500 mg/l. Ecology reviewed the WTP study and made a determination to increase the monthly average limit for TDS in the permit to 500 mg/l, which is the maximum allowable limit under WAC 173-

200 (Water Quality Standards for Groundwater). Ecology also determined a need to evaluate performance on discharges generated by WTP during this permit cycle. The variability study described in Special Condition S9 serves this purpose. Ecology will evaluate performance of the system at the next permit issuance and determine performance-based permit limits.

The WTP BAT/AKART Addendum #1 (04-RCA-0017) identified three changes to the original study; it:

1. Added biocides and added a process to treat the increased concentrations of total trihalomethanes (THMs), which would exceed the ST0004502 effluent limit.
2. Changed the source water from raw water to potable water as the primary source for WTP. Potable water would eliminate the need for on-site treatment of corrosion products in raw water piping.
3. Identified the WTP start date for full operation.

WTP BAT/AKART Addendum #2 (04-AMCP-0184) described the selection of air stripping as the technology for removing THMs. It also provided revised source water composition and the non-radioactive liquid waste (NLD) effluent flow rates and composition.

WTP BAT/AKART Addendum #3 (11-EMD-0040) submitted in December 2010, provided updated WTP design information affecting the WTP NLD to the TEDF which included expansion of the WTP Water Treatment Facility and planned construction of a new Chiller Plan/Cooling Tower supporting the Pretreatment Facility. DOE-RL estimated a total flow rate of the NLD effluent discharged from WTP to TEDF of a maximum of 396 gpm. It expects that the composition of the effluent will meet the permit effluent limits of ST0004502.

Because this is a significant new waste stream from a newly constructed facility, Ecology included a study of effluent variability in the proposed permit to evaluate the listed constituents in the effluent. Part VI, section G of this fact sheet discusses the TEDF Variability Study required under Special Condition S9.

Industrial Process(s)

The facility generates most of the effluent streams from uses that do not involve direct contact of the water with industrial processes. No manufacturing processes or products are associated with the individual effluent streams. Uses that generate the effluent are primarily those associated with the following:

- Ventilation, heating, and cooling systems for the buildings
- Steam condensate from heating potable (drinkable) water
- Condensate of pressurized softened or deionized potable water
- Rainwater from parking lots and exterior paved areas
- Potable (treated) water
- Untreated Columbia River water
- Boiler blowdown
- Floor drains with limited and strictly controlled usage

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- Hydrotest, maintenance, construction, cooling water, condensate, and stormwater discharges that are covered by Hanford State Waste Discharge Permit ST0004511
- Reverse Osmosis brine
- Air Stripping

III. SOURCES OF EFFLUENT

A. Uses Generating Effluent

The following table summarizes the major sources of effluent generated at the facilities permitted to discharge to the 200 Area TEDF.

Table 2 Major Sources Discharging to the 200 Area TEDF

Facility	Uses Generating Effluent
Plutonium finishing plant	Ventilation heating/cooling, steam condensate, cooling water, compressed air production, process water, rainwater, and potable water overflow, and miscellaneous water from deactivation, dismantling, and maintenance activities.
222-S Laboratory complex	Rainwater and potable water
T Plant	Steam condensate, cooling water, heating coil water, and floor drains located in non-contaminated areas
242-A Evaporator	Cooling water and steam condensate
242-A-81 Water services building	Untreated Columbia river water, and strainer backwash
Waste Encapsulation Storage Facility (WESF)	Cooling water, rainwater collected from outdoor storm drains from non-radiation areas, raw water, and potable water
Package boilers (242-A Annex, 283E, and 283W)	Boiler blowdown, steam condensate, cooling water, and water softener regenerate flows
241-A Tank Farm Cooling Water	Cooling Water
Streams permitted by ST-4511	Miscellaneous waste streams (hydrotest, maintenance, construction, cooling water, etc.)
Waste Treatment Plant	Cooling/chilled water, steam condensate, boiler blowdown, reverse osmosis brine, air stripping, compressors, heating, ventilation, air conditioning, pretreatment, non-dangerous, non-radioactive water from sumps.

Wastewater Treatment Processes

The 200 Area TEDF is a pipeline with three pump stations that conveys effluent from several generating facilities to disposal/infiltration ponds, and does not provide any treatment. The effluent will discharge into A Pond or B Pond that the facility plans to rotate on a monthly basis. Ecology reviewed and approved engineering specifications and plans before construction. A summary of the major activities conducted at some of the generating facilities is included below. However, note that the effluent discharged under this draft permit is generated from the limited activities listed in the preceding table. Hence, it is not subject to contamination from all activities at these facilities.

- **Plutonium Finishing Plant Effluent**

The Plutonium Finishing Plant (PFP) wastewater stream consists of potentially contaminated wastewater and uncontaminated wastewater. The uncontaminated discharges include ventilation heating/cooling, steam condensate, potable water, and storm water runoff. The potentially contaminated wastewater includes noncontact process cooling water, miscellaneous wastewater from deactivation, dismantling and maintenance activities, steam condensate, and air conditioning condensate.

BAT/AKART for the effluent from the Plutonium Finishing Plant is implemented in the form of source controls and/or treatment. The facility has either eliminated contaminated wastewater sources or replaced them with closed loop cooling systems. Remaining wastewater sources that may potentially be contaminated are sent to the 243-Z Low Level Waste Treatment Facility. At 243-Z wastewater is filtered to remove suspended solids, activated carbon is used to trap organics, bone char is used to absorb transuranic (chemical elements with atomic numbers greater than 92) particles, and ion exchange resin is used to capture ionic salts. This treated water is released into the collection system for PFP's uncontaminated discharges. Monitoring and effluent water sampling is conducted at the point of PFP's discharge into the Treated Effluent Disposal Facility collection system.

- **222-S Laboratory Effluent**

The 222-S Laboratory's primary function is to provide chemical and radiological analyses of samples associated with ongoing Hanford Site operations and research programs. Source controls were implemented as BAT/AKART for the 222-S Laboratory's effluent. Improvements included piping and equipment changes to reduce the potential for contamination; adding new retention tanks; eliminating steam cell heaters to avoid condensate generation; and replacing heating, ventilation, and air conditioning air washers with electric chillers to eliminate blowdown effluent. The laboratory sends spent reagents to both onsite and offsite Transfer, Storage, and Disposal Facilities and does not discharge them to 200 Area TEDF.

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- T Plant Effluent

The T Plant provides decontamination services, waste verification, and other waste handling activities for the Hanford Site. Source controls with retention/diversion capabilities were implemented as BAT/AKART for the T Plant's effluent. DOE-RL replaced water-cooled air compressors with air-cooled units. It replaced the water-cooled pressurized water reactor chiller with an air-cooled, refrigerant cooling system. Stored chemicals were removed and sumps and drains were sealed. The associated laboratory is no longer active and is not a source of wastewater.

- WESF

Currently, the Waste Encapsulation Storage Facility (WESF) ensures safe storage and management of radiological and chemical waste inventories. WESF also stores chemicals and discharges cooling water, rainwater, raw water, and potable water to 200 Area TEDF.

- 242-A-81 Water Services Building Effluent

The 242-A-81 Water Services Building houses equipment that strains coarse, suspended solids from untreated Columbia River water. Periodic flushing (backwashing) of the filtering media is required to cleanse the material, and results in an effluent. Ecology determined that prior pollution prevention controls were adequate at the 242-A-81 Water Services Building.

- 242-A Evaporator

The Evaporator is used to reduce the volume of waste stored in underground tanks on Hanford. The Evaporator discharges a large volume of non-contact cooling water to 200 Area TEDF when the facility is supporting tank farm operations. Typically these evaporator campaigns will operate a few weeks per year.

- 241-A Tank Farm Cooling Water

DOE-RL has reduced the 241-A Tank Farm Cooling Water System from eight sources to one. The remaining source is made up of four 702-AZ Cooling Towers. Each cooling tower is part of a tertiary cooling system for a ventilation system used for cooling hazardous and radioactive wastes stored in underground storage tanks. Heat is removed via heat exchanger from a closed loop chilled water system, which in turn removes heat from tank vapor via a shell and tube heat exchanger. Due to the systems arrangement, it is unlikely that radioactive or hazardous material would contaminate this stream.

- Tank Waste Treatment and Immobilization Plant (WTP)

Construction of the WTP initiated in 2001 and full operation for dangerous waste/mixed waste treatment is scheduled to begin in 2019. The WTP mission is to vitrify tank waste stored in the 200 Area tanks. WTP generates a non-radioactive liquid waste (NLD) effluent stream which discharges to the 200 Area TEDF. Cooling tower blowdown and reverse osmosis brine are the primary WTP

wastewater contributions to TEDF. Other minor sources include non-dangerous, non-radioactive wastewater from sumps, steam condensate, and boiler blowdown. Source controls and end-of-pipe treatment are BAT/AKART for the WTP effluent. DOE plans to install an end-of-pipe treatment system consisting of air-stripping to remove Trihalomethanes, primarily chloroform. These Trihalomethanes are a by-product of treating source water with chlorine.

Collection System Status

The 12 mile-long pipeline, constructed to collect and convey the effluent to the disposal ponds was tested for integrity prior to use. Older, pre-existing ancillary pipelines at individual facilities have been cleaned or replaced if determined to be a potential source of contamination from deposition of contaminants that were the result of past practices. The collection system also includes three pump stations. Pump Station #1 is located in the 200 West Area near the Plutonium Finishing Plant. Pump Station #2 is located in the 200 East Area near B Plant. Pump Station #3 is in the 200 East Area near the TEDF Sample Station, and serves the 242-A Evaporator. Inputs to the system are limited in nature, documented, and strictly controlled. All access points to the system are strictly controlled and operated by trained personnel.

Land Treatment and Distribution System (Infiltration Basin)

The 200 Area TEDF is a collection system and two infiltration/disposal basins of approximately five acres in size. The infiltration/ disposal basins are called A Pond and B Pond. The infiltration systems are capable of handling the planned design flows. These basins are located on the Hanford Site, east of the 200 East Area. The Hanford Site is located within the semiarid Pasco Basin of the Columbia Plateau in south-central Washington State. The Hanford Site occupies an area of about 560 square miles northwest of the confluence of the Snake and Yakima rivers with the Columbia River. It comprises an area of about 30 miles north to south, and 24 miles east to west. Public access is restricted and the large area provides a buffer for the smaller areas currently used for storage of nuclear materials, waste storage, and waste disposal. DOE actively uses or has disturbed about 6% of the total land area.

The Columbia River flows through the northern part of the Hanford Site. It then turns south and forms part of the Site's eastern boundary (see Figure 1). The Yakima River runs along part of the southern boundary and joins the Columbia River below the City of Richland. Richland borders the Hanford Site on the southeast. Rattlesnake Mountain, the Yakima Ridge, and Umtanum Ridge form the southwestern and western boundaries of the Hanford Site. The Saddle Mountains form the northern boundary. Two small east-west ridges, Gable Butte and Gable Mountain, rise above the plateau of the central part of the Hanford Site. Adjoining lands to the west, north, and east are principally range and agricultural lands. The cities of Richland, Kennewick, and Pasco constitute the nearest population centers and are located southeast of the Hanford Site.

The Hanford Site encompasses more than 3000 waste management units and four groundwater contamination plumes that have been grouped into 44 operable units. The 200 Area TEDF is located near the center of the Hanford Site, approximately two miles east of the eastern boundary of the 200 East Area. DOE chose this site because area soils were essentially uncontaminated. Modeling indicates that additional infiltration would not mobilize contaminants or contribute to contamination plume migration originating from other locations.

B. Description of the Groundwater

The 200 Area TEDF is underlain by geologically young sediments that, in turn, are underlain by bedrock. The bedrock is Columbia River Basalt, at a depth of about 250 feet below the surface. The bedrock slopes gently (approximately one-half of a degree) toward the south-southwest. The sediments that lie immediately above the basalt are called the Ringold Formation. The Hanford Formation lies above the Ringold Formation. Alluvium and dune sand cover part of the surface of the site.

The upper part of the Hanford Formation consists of highly permeable, unconsolidated gravel. The lower part of the formation consists of silt and sandy gravel. The thickness of the formation varies from 90 to 100 feet. The hydraulic conductivity (permeability) of this formation is very high.

The Ringold Formation at the disposal site consists of lenses (localized pockets) composed of partially consolidated sand and gravel, fine-grained sand, and silt and clay locally cemented by caliche. The Ringold Formation contacts the Hanford Formation at approximately 90 to 110 feet beneath the surface. The uppermost part of the Ringold Formation in this area consists of relatively impermeable silt and clay that varies from about 40 feet thick at the northwest corner to about 80 feet thick at the southeast corner of the site. These silts and clays are called the Lower Mud Sequence of the Ringold formation. The lower part of the Ringold Formation, below this Lower Mud Sequence, consists of an 80 to 120 (approximate) foot thick zone of silty sandy gravel named Unit A. The natural confined aquifer (also called the uppermost aquifer) below the disposal site is found primarily in this gravel zone. The three groundwater monitoring wells, installed to monitor this disposal activity, penetrate to this aquifer. The facility encountered a minor amount of perched water above the Ringold lower mud unit when installing the wells. Recent discharges to the ground at the facility have likely increased the amount of perched water. The static water level in wells completed within the uppermost aquifer currently varies from 113 to 123 feet below the surface. Both the Lower Mud Sequence and Unit A slope gradually to the south-southeast.

Hydrologic and geochemical monitoring at the site has demonstrated that the Lower Mud Sequence of the Ringold Formation acts as an effective retardant to movement of overlying water (originating from the disposal ponds) down to the uppermost groundwater aquifer in the Unit A gravels. This phenomenon occurs because the mud unit is highly impermeable, and does not conduct water well. Hence, the presence of

the mud sequence will naturally prevent water from moving directly downward below the Hanford formation. The mud also acts to confine the groundwater in the Unit A gravels beneath the site such that it has a positive upward pressure gradient. This positive pressure also impedes the entry of the treated effluent into the aquifer in the immediate vicinity of the disposal facility.

Groundwater flows down-gradient toward the southwest at a flow rate of less than one foot per day in the uppermost aquifer beneath the TEDF. Hydrologic tests and recent head measurements indicate that the groundwater flow may be less than 0.01 feet per day. Groundwater currently flows toward the west from the 216-B-3 Pond complex (located west-northwest of 200 Area TEDF) with a hydraulic gradient of about 0.0014 foot per foot. Water levels in the area are currently declining at a rate of about 0.2 feet per year.

The Lower Mud Sequence of the Ringold formation is absent beneath portions of the main, A, and B lobes of the 216-B-3 Pond complex. Consequently, effluent previously discharged to these ponds migrated directly downward into the uppermost aquifer of the Ringold Unit A gravel. The additional volume and down-gradient movement of these B pond discharges contributes to the upward pressure gradient currently observed in the upper-most aquifer beneath 200 Area TEDF. Since effluent discharges to the main pond, and A and B lobes of the 216-B-3 Pond complex has ceased, the magnitude of the hydraulic head in the aquifer beneath 200 Area TEDF is gradually decreasing.

DOE discharged effluent to the 3C expansion pond of the 216-B-3 Pond complex prior to discharge to 200 Area TEDF, which began in 1997. The proposed permit still allows for emergency overflows to this pond. At this location, the Lower Mud Sequence is known to be present. Consequently, the water infiltrating downward from this pond likely did not directly enter the upper most aquifer. Instead, the water may flow laterally down-gradient along the top of the Lower Mud Sequence until it reaches an area where the mud does not exist, or is offset by a fault.

The May Junction Fault is located approximately one mile east from 200 Area TEDF. It trends north-south with the east side displaced vertically downward about 185 feet. It is possible that the fault may hydraulically connect the confined aquifer in the Unit A gravel of the Ringold formation with water perched in the Hanford formation at the top of the Lower Mud Sequence, but it is also possible that mud has smeared along the fault zone sealing the fault and blocking the pathway. Recent research makes it appear likely that the May Junction Fault is an impediment to eastward movement of groundwater in the Ringold (confined) aquifer.

East of the May Junction Fault to the Columbia River, the upper most aquifer is found in the Hanford formation gravels, with the possible exception of the area east-northeast of Gable Mountain. Geologic processes in this area have resulted in the upper most aquifer likely occurring in Unit A of the Ringold Formation.

The disposal facility is located approximately six miles west of the Columbia River. Prior to discharge, computer modeling of groundwater flow provided an estimated

travel time of approximately 10 to 20 years for effluent discharged at 200 Area TEDF to reach the Columbia River. Other more recent modeling estimate travel times approaching 120 to 300 years for effluent to reach the Columbia River.

The average annual precipitation at the Hanford Site is 6.3 inches. Minor local variations occur. Most of the precipitation occurs during the winter, with nearly half of the annual amount occurring from November through February. Snowfall accounts for about 38% of all precipitation. Days with greater than 0.51 inch of precipitation occur less than 1% of the year. These semiarid conditions mitigate the development of groundwater contamination plumes.

Projections are that the probable maximum flood on the Columbia River would not encroach within three miles of the 200 Area TEDF Site.

The Hanford Site has been botanically characterized as shrub-steppe. The major plant community in the vicinity of the 200 Area TEDF is Sagebrush/Cheatgrass or Sandberg Bluegrass and Greasewood/Cheatgrass-Saltgrass. DOE selected the disposal site to avoid impact on historical, archaeological, and cultural resources.

C. Wastewater Characterization

DOE-RL reported the concentration of pollutants in the discharge in the permit application and in discharge monitoring reports. The tabulated data represents the quality of the wastewater discharged from July 2006–March 2011. The wastewater prior to infiltration is characterized as shown in Table 3:

Table 3 Wastewater Characterization

Parameter	Units	Average Value	Maximum Value
Total Dissolved Solids	µg/l	101,000	347,000
Arsenic (total)	µg/l	0.654	3.1
Cadmium (total)	µg/l	0.054	0.136
Chromium (total)	µg/l	0.571	1.17
Lead (total)	µg/l	0.319	2.96
Mercury (total)	µg/l	0.052	0.090
Chloride	mg/l	3.78	17.0
Nitrate (as N)	µg/l	162	861

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Parameter	Units	Average Value	Maximum Value
Iron (total)	µg/l	92	414
Manganese (total)	µg/l	4,720	5,720
Gross Alpha	pCi/l	1.6	14
Gross Beta	pCi/l	3.4	27
Tritium	pCi/l	230	550
Oil and Grease	mg/l	5.1	7.2
Copper	µg/l	6.18	28.7
Selenium	µg/l	0.617	8.09
Uranium	µg/l	0.386	1.3
Bromide	µg/l	NQ	NQ
Fluoride	µg/l	36	100
Nitrite as N	µg/l	11	19
Phosphate as P	µg/l	334	15,100
Sulfate	µg/l	17,700	28,800
Aluminum	µg/l	667	5,690
Antimony	µg/l	31.6	39.4
Barium	µg/l	29.2	38
Beryllium	µg/l	<0.5	<0.5
Calcium	µg/l	22,400	26,400
Cobalt	µg/l	1.6	2.3
Manganese	µg/l	8.3	51
Nickel	µg/l	2.8	6.7
Potassium	µg/l	1,680	6,370

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Parameter	Units	Average Value	Maximum Value
Silicon	µg/l	2,270	3,160
Silver	µg/l	3.9	6.8
Sodium	µg/l	3,970	8,190
Thallium	µg/l	36.0	71.2
Titanium	µg/l	4.2	10.2
Vanadium	µg/l	6.6	14
Zinc	µg/l	31.2	190
1,1,1-Trichloroethane	µg/l	<2.0	<2.0
1,1-Dichloroethane	µg/l	<2.0	<2.0
Benzene	µg/l	<2.0	<2.0
Bromodichloromethane	µg/l	NQ	NQ
Bromoform	µg/l	<2.0	<2.0
Carbon Tetrachloride	µg/l	<2.0	<2.0
Chlorobenzene	µg/l	<2.0	<2.0
Chloroform	µg/l	2.2	7.8
Dibromochloromethane	µg/l	<2.0	<2.0
Methylene Chloride	µg/l	1.7	13
Toluene	µg/l	<2.0	<2.0
Total Trihalomethanes	µg/l	2.2	7.8
Trichloroethene	µg/l	NQ	NQ
1,2,4-Trichlorobenzene	µg/l	<0.6	<0.6
1,4-Dichlorobenzene	µg/l	<17.6	<17.6
2,4-Dinitrotoluene	µg/l	<0.4	<0.4

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Parameter	Units	Average Value	Maximum Value
2-Chlorophenol	µg/l	<2.0	<2.0
4-Chloro-3-methylphenol	µg/l	NQ	NQ
4-Nitrophenol	µg/l	<1.0	<1.0
Acenaphthene	µg/l	<0.4	<0.4
Bis(2-ethylhexyl) phthalate	µg/l	0.92	2.47
n-Nitrosodi-n-dipropylamine	µg/l	NQ	NQ
Pentachlorophenol	µg/l	<1.0	<1.0
Phenol	µg/l	<4.0	<4.0
Pyrene	µg/l	<0.6	<0.6
Conductivity	µmho/cm	177	437
Parameter	Units	Minimum Value	Maximum Value
pH	standard units	6.08	8.99
NQ means Not Quantifiable			

DOE-RL reported the concentration of pollutants in the groundwater in the permit application and in discharge monitoring reports. The tabulated data, as shown in Table 3, represents the quality of the groundwater in the monitoring wells from July 2006–March 2011. Well numbers 699-40-36 and 699-41-35 are downgradient wells. Well number 699-42-37 is the upgradient well.

Table 4 Recent Groundwater Characteristics

Parameter	Units	Minimum Value			Maximum Value		
		699-40-36	699-41-35	699-42-37	699-40-36	699-41-35	699-42-37
Total Dissolved Solids	mg/L	129	174	203	426	347	292

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Parameter	Units	Minimum Value			Maximum Value		
		699-40-36	699-41-35	699-42-37	699-40-36	699-41-35	699-42-37
Arsenic (total)	µg/l	3.18	3.68	4.10	4.91	5.50	6.07
Cadmium (total)	µg/l	NQ	NQ	NQ	NQ	NQ	NQ
Chromium (total)	µg/l	1.12	3.44	3.63	8.15	7.41	29.9
Lead (total)	µg/l	NQ	NQ	NQ	0.695	0.190	0.660
Mercury (total)	µg/l	NQ	NQ	NQ	0.0676	0.057	0.086
Chloride	mg/L	3.68	3.45	4.03	4.61	8.24	9.54
Nitrate (as N)	mg/L	NQ	0.164	0.198	0.044	1.580	1.580
Iron (total)	µg/l	NQ	NQ	51.5	136	176	955
Manganese (total)	µg/l	4.5	NQ	NQ	13.0	10	18
Gross Alpha	pCi/l	NQ	NQ	NQ	4.6	7.8	6.2
Gross Beta	pCi/l	6.6	6.5	NQ	12	11	10
Tritium	pCi/l	NQ	NQ	NQ	NQ	NQ	10.4
pH	SU	7.9	7.82	7.59	8.36	8.23	9.21

D. Summary of Compliance with Previous Permit Issued on May 18, 2000

The 200 Area TEDF has complied with the effluent limits and permit conditions throughout the duration of the permit issued on May 18, 2000. Ecology assessed compliance based on its review of the facility's discharge monitoring reports (DMRs) and on recent inspections.

The table below summarizes compliance with report submittal requirements over the permit term.

Table 5 Permit Submittals

Submittal Name	Due Date	Date Submitted	Date Reviewed or Approved
Application for Permit Renewal	10/01/2004	10/08/2003	12/16/2003
O&M Manual Review Letter	Annually	*08/10/2011	08/16/2011
Noncompliance Notification Report	As required	*02/11/2011	02/15/2011
Overflow Sample Analysis Report	As required	*02/11/2011	02/15/2011
*Most Recent Submittal			

E. State Environmental Policy Act (SEPA) Compliance

As the lead agency, Ecology performed a threshold determination of the impacts on the environment that could result from reissuing the TEDF wastewater discharge permit. Had Ecology reissued the TEDF permit to impose conditions that are within Federal effluent limits and State rules upon existing discharges only, then the action would have been exempt from SEPA under the State law (RCW 43.21C.0383). The draft permit makes a change that alone would make the action exempt; however, it also includes other changes that Ecology determined required a review for a significant environmental impact.

The draft permit adds a new major waste stream composed of non-radioactive liquid waste effluent from various facilities within the Hanford Waste Treatment and Immobilization Facility (WTP). Discharges will come from the facilities that appear in the list in the History section of the Fact Sheet. The WTP treatment facility is able to treat the effluent to meet the limits in the existing permit, with the exception of the existing monthly average effluent limit for Total Dissolved Solids (TDS) (250 mg/l). To ensure that the WTP effluent will meet the State’s quality standards for groundwater, the draft permit raises the monthly average limit from 250 milligrams per liter (mg/l) to 500 mg/l. This limit is the maximum allowable limit under WAC 173-200 (Quality Standards for Groundwater). In addition, Ecology added a permit condition that requires the USDOE to perform an Effluent Variability Study and report the results. If the results of that study indicate that the TEDF can achieve a lower TDS limit, Ecology may require performance-based limits during the next permit cycle or may modify the permit during the current permit cycle.

Ecology also changed the points of compliance for lead and cadmium from the groundwater wells to the effluent. New points of compliance are necessary because the monitoring wells that the USDOE used for monitoring lead and cadmium concentrations in the groundwater from the TEDF are completed in the confined aquifer that is isolated from the TEDF discharges. As the wells are not effective for

monitoring TEDF discharges, the USDOE will now meet the Federal effluent limits and State rules when the effluent enters the infiltration basins. The wells are not monitoring the correct aquifer, so there is no need to sample the groundwater.

After reviewing the changes to the TEDF permit and the impacts on the environment, Ecology determined that the impacts are not significant. Ecology prepared a Determination of Significance that documents the results of the review.

IV. Proposed Permit Limits

State regulations require that Ecology base limits in a State Waste Discharge permit on the:

- Technology and treatment methods available to treat specific pollutants (technology-based). Dischargers must treat wastewater using all known, available, reasonable methods of prevention, control, and treatment (AKART). Ecology has developed guidance describing technology-based (AKART) criteria for industrial/commercial systems that discharge to ground (Ecology, 1993; 2004).
- Operations and best management practices necessary to meet applicable water quality standards to preserve or protect existing and future beneficial uses of the ground waters.
- Groundwater quality standards (Ecology, 1996).
- Applicable requirements of other local, state, and federal laws.

Ecology applies the most stringent of technology and water quality-based limits to each parameter of concern and further describes the proposed limits below.

The limits in this permit reflect information received in the permit application and from supporting reports and studies (engineering, hydrogeology, and monitoring). Ecology evaluated the permit application and determined the limits needed to comply with the rules adopted by the State of Washington. Ecology does not develop effluent limits for all reported pollutants. Some pollutants are not treatable at the concentrations reported, are not controllable at the source, and are not listed in regulation.

Ecology does not usually develop permit limits for pollutants not reported in the permit application but may be present in the discharge. The permit does not authorize the discharge of the non-reported pollutants. During the five-year permit term, the facility's effluent discharge conditions may change from those conditions reported in the permit application. The facility must notify Ecology if significant changes occur in any constituent. Until Ecology modifies the permit to reflect additional discharges of pollutants, a permitted facility could be violating its permit.

A. Design Criteria

Under WAC 173-216-110 (4), flows and waste loadings must not exceed approved design criteria. Ecology approved the design criteria for this facility's collection system and infiltration basins based on the *200 Area Treated Effluent Disposal Facility Wastewater Engineering Report* dated February 1992 and the updated information from the WTP engineering study prepared by US DOE-RL. Table 6 includes design criteria from the referenced reports.

Table 6 Design Criteria for the Infiltration Basins

Parameter	Design Quantity
Monthly Average Flow (Maximum Month)	5.5 MGD
Average Yearly Flow	1.7 MGD

B. Technology-based Effluent Limits

Waste discharge permits issued by Ecology specify conditions which require the facility to use all known available and reasonable methods of prevention, control and treatment (AKART) before discharging to waters of the state (RCW 90.48).

Ecology approved the engineering report titled *200 Area Treated Effluent Disposal Facility Wastewater Engineering Report*, dated February 1992 and prepared by the US DOE-RL in addition to the WTP *BAT/AKART Report*, (October 2003). Ecology determined that the facility meets the minimum requirements demonstrating compliance with the AKART standard if the U.S. Department of Energy operates the treatment and disposal system as described in the approved engineering report and any subsequent Ecology approved reports.

See **Appendix D** for the Enforcement Limit Derivation Summary which discusses the rationale for technology-based and groundwater quality-based limits.

US DOE-RL must meet the permit limits in the table below to satisfy the requirement for AKART.

Table 7 Technology-Based Effluent Limits

Effluent Limits		
Parameter	Average Monthly	Maximum Daily
Total Trihalomethanes	20 µg/l	---
Methylene Chloride	5 µg/l	---
Cadmium (total)	5 µg/l	---
Chromium (total)	20 µg/l	---
Lead (total)	10 µg/l	---
Chloride	58,000 µg/l	116,000 µg/l
Nitrate (as N)	620 µg/l	1,240 µg/l

C. Groundwater Quality-based Effluent Limits

In order to protect existing water quality and preserve the designated beneficial uses of Washington's groundwaters including the protection of human health, WAC 173-200-100 states that waste discharge permits shall be conditioned in such a manner as to authorize only activities that will not cause violation of the groundwater quality standards. The goal of the groundwater quality standards is to maintain the highest quality of the State's groundwaters and to protect existing and future beneficial uses of the groundwater through the reduction or elimination of the discharge of contaminants to groundwater [WAC 173-200-010(4)]. Ecology achieves this goal by:

- Applying all known available and reasonable methods of prevention, control and treatment (AKART) to any discharge.
- Applying the antidegradation policy of the groundwater standards.

Establishing numeric and narrative criteria for the protection of human health and the environment in the groundwater quality standards.

Antidegradation Policy

The State of Washington's Ground Water Quality Standards (GWQS) require preservation of existing and future beneficial uses of groundwater through the antidegradation policy, which includes the two concepts of antidegradation and non-degradation. Antidegradation is not the same as non-degradation (see below).

Antidegradation

Antidegradation applies to calculation of permit limits in groundwater when background (see below) contaminant concentrations are less than criteria in the

GWQS. Ecology has discretion to allow the concentration of contaminants at the point of compliance to exceed background concentrations but not exceed criteria in the GWQS. Ecology grants discretion through an approved AKART engineering analysis of treatment alternatives. If the preferred treatment alternative predicts that discharges to groundwater will result in contaminant concentrations that fall between background concentrations and the criteria, then the preferred treatment alternative should protect beneficial uses and meet the antidegradation policy. In this case, the predicted concentrations become the permit limits. If the preferred alternative will meet background contaminant concentrations, background concentrations become the permit limits. Permit limits must protect groundwater quality by preventing degradation beyond the GWQS criteria. If discharges will result in exceedance of the criteria, facilities must apply additional treatment before Ecology can permit the discharge.

Non-degradation

Non-degradation applies to permit limits in groundwater when background contaminant concentrations exceed criteria in the GWQS. Non-degradation means that discharges to groundwater must not further degrade existing water quality. In this case, Ecology considers the background concentrations as the water quality criteria and imposes the criteria as permit limits. To meet the antidegradation policy, the facility must prepare an AKART engineering analysis that demonstrates that discharges to groundwater will not result in increasing background concentrations. Ecology must review and approve the AKART engineering analysis.

Additional information on antidegradation and non-degradation may be obtained by referring to the *Implementation Guidance for the Ground Water Quality Standards (Implementation Guidance)*, Ecology Publication #96-02 (available at <http://www.ecy.wa.gov/biblio/9602.html>).

Background Water Quality

Background water quality is determined by a statistical calculation of contaminant concentrations without the impacts of the proposed activity. The calculation requires an adequate amount of groundwater quality data and determining the mean and standard deviation of the data, as described in the *Implementation Guidance*. Following the procedure in the *Implementation Guidance*, Ecology then defines background water quality for most contaminants as the 95% upper tolerance limit. This means that Ecology is 95% confident that 95% of future measurements will be less than the upper tolerance limit. There are a few exceptions to the use of the upper tolerance limit. For pH, Ecology will calculate both an upper and a lower tolerance limit resulting in an upper and lower bound to the background water quality. If dissolved oxygen is of interest, Ecology will calculate a lower tolerance limit without an upper tolerance limit.

Applicable groundwater criteria as defined in chapter 173-200 WAC and in RCW 90.48.520 for this discharge include those in Table 8:

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Table 8 Ground Water Quality Criteria

Parameter	Units	Ground Water Criteria	Background Value of Wells Before Discharge		
			699-42-37	699-41-35	699-40-36
Total Dissolved Solids	mg/L	500	332	246	266
Chloride	mg/L	250	8.5	3.8	3.7
Sulfate	mg/L	250	31.8	10.8	28.1
Nitrate (as nitrogen)	mg/L	10	8.1	1.2	1.1
pH Minimum/Maximum	standard units	6.5 to 8.5	7.31-8.59	6.9-8.94	7.26-8.46
Manganese	mg/L	0.05	0.4	0.3	0.3
Total Iron	mg/L	0.3	17.0	0.9	5.2
Total Lead	mg/L	0.05	NQ	NQ	NQ
Total Mercury	mg/L	0.002	NQ	NQ	NQ
Total Chromium	mg/L	0.05	0.17	0.78	0.78
Total Cadmium	mg/L	0.01	NQ	NQ	NQ
Total Arsenic	µg/L	0.05	0.007	0.006	0.002
Tritium	pCi/l	20,000	ND	ND	ND
Gross Alpha	pCi/l	15	13.3	24.0	18.3
Gross Beta	pCi/l	50	12.8	20.0	17.5
Bis (2-ethylhexyl) phthalate	µg/L	6.0	NQ	NQ	NQ
Carbon Tetrachloride	µg/L	0.3	NQ	NQ	NQ
Chloroform	µg/L	7.0	ND	ND	ND
Methylene chloride	µg/L	5.0	NQ	NQ	NQ
NQ means Not Quantifiable. ND means No Data.					

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Ecology has reviewed existing records for the facility’s land treatment site and there is sufficient data to determine the background groundwater quality as defined in Chapter 173-200 WAC and described in the Implementation Guidance for the Ground Water Quality Standards; Ecology, Revised October 2005.

Ecology established groundwater enforcement limits to protect the quality of the groundwater based on the background values in groundwater. The proposed groundwater enforcement limits establish the quality of the wastewater that USDOE-RL may discharge to the infiltration ponds.

Table 9 includes the groundwater quality-based enforcement limits for the discharge.

Table 9 Groundwater Quality-Based Effluent Limits

Parameter	Effluent Enforcement Limits
Bis (2-ethylhexyl) phthalate	10 µg/l
Carbon Tetrachloride	5 µg/l
Chloroform	7 µg/l
Arsenic (total)	15 µg/l
Iron (total)	300 µg/l
Manganese (total)	50 µg/l
Mercury (total)	2 µg/l
Total Dissolved Solids	500 mg/l

D. Comparison of Effluent Limits with the Previous Permit Issued on May 18, 2000

As shown in Table 10, one limit and two points of compliance have been changed in this draft permit. Ecology increased the Total Dissolved Solids (TDS) monthly average effluent limit from 250 mg/l to 500 mg/l, and eliminated the TDS daily maximum limit. US DOE-RL engineering studies (WTP BAT/AKART Engineering Studies, including WTP BAT/AKART Addenda 1, 2 and 3) show that new waste streams from the Tank Waste Treatment and Immobilization Plant (WTP) will increase the amount of TDS in the effluent. The engineering studies predicted applying BAT/AKART to the new waste streams would still produce a monthly average higher than the previous limit of 250 mg/l. Ecology therefore increased the TDS limit to the Groundwater Quality Criteria limit of 500 mg/l. If the results of a permit-required Effluent Variability Study show the facility can achieve a lower TDS

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limit, Ecology may require performance-based limits during the next permit cycle or may modify the permit during this cycle.

Ecology moved the points of compliance for lead and cadmium from the groundwater monitoring wells to the effluent. These new points of compliance were established because the monitoring wells are installed in a confined aquifer and are isolated from the TEDF discharges, making them ineffective at monitoring the discharges from TEDF. Therefore, groundwater monitoring at these wells has been discontinued in this draft permit. However, the wells will continue to be monitored as part of the 200-PO-1 Operable Unit and site wide surveillance monitoring plan on an annual basis.

Table 10 Comparison of Previous and Proposed Limits

Parameter	Basis of Limit	Existing Limits	Proposed Limits
Effluent Limits			
Bis (2-ethylhexyl) phthalate	Water Quality Based	10 µg/l AM	10 µg/l AM
Total trihalomethanes	Technology	20 µg/l AM	20 µg/l AM
Carbon tetrachloride	Water Quality Based	5 µg/l AM	5 µg/l AM
Chloroform	Water Quality	7 µg/l AM	7 µg/l AM
Methylene chloride	Technology	5 µg/l AM	5 µg/l AM
Arsenic (total)	Water Quality Based	15 µg/l AM	15 µg/l AM
Chromium (total)	Technology	20 µg/l AM	20 µg/l AM
Cadmium (total)	Technology	NA	5 µg/l AM
Iron (total)	Water Quality Based	300 µg/l AM	300 µg/l AM
Lead (total)	Technology	NA	10 µg/l AM
Manganese (total)	Water Quality Based	50 µg/l AM	50 µg/l AM
Mercury (total)	Water Quality Based	2 µg/l AM	2 µg/l AM
Chloride	Technology	58,000 µg/l AM 116,000 µg/l DM	58,000 µg/l AM 116,000 µg/l DM

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Parameter	Basis of Limit	Existing Limits	Proposed Limits
Nitrate (as N)	Technology	620 µg/l AM 1,240 µg/l DM	620 µg/l AM 1,240 µg/l DM
Total Dissolved Solids	Water Quality Based	250,000 µg/l AM 500,000 µg/l DM	500,000 µg/l AM
Flow	Technology	5.5 MGD AM 1.7 MGD AY	5.5 MGD AM 1.7 MGD AY
Groundwater Limits			
Cadmium (total)	Technology	5 µg/l	NA
Lead (total)	Technology	10 µg/l	NA
pH	Water Quality Based	6.5-8.5 standard units	NA
AM means an average monthly limit, DM means a daily maximum limit, and AY means average yearly.			

V. Monitoring Requirements

Ecology requires monitoring, recording, and reporting (WAC 173-216-110) to verify that the treatment process functions correctly, the discharge meets groundwater criteria and that the discharge complies with the permit's effluent limits.

A. Wastewater Monitoring

Ecology details the proposed monitoring schedule under Permit Special Condition S2. 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 effluent is monitored at Sampling Station 6653. A composite sampler and continuous meters for pH, conductivity, and flow are at this location. The composite sampler is used to collect 24 hour composite samples of the discharge.

VI. Other Permit Conditions

A. Reporting and Recordkeeping

Ecology based Special Condition S3 on its authority to specify any appropriate reporting and recordkeeping requirements to prevent and control waste discharges (WAC 173-216-110).

B. Operations and Maintenance

Ecology requires dischargers to take all reasonable steps to properly operate and maintain their wastewater treatment system in accordance with state regulations (WAC 173-240-080 and WAC 173-216-110). The facility has prepared and must submit an annual update of an operation and maintenance (O&M) manual for the wastewater facility. If the O&M Manual has been reviewed and no changes have been made, the facility must submit an annual letter to Ecology stating the document has been reviewed.

Implementation of the procedures in the operation and maintenance manual ensures the facility's compliance with the terms and limits in the permit and ensures the facility provides AKART to the waste stream.

C. Solid Waste Control Plan

The 200 Area TEDF could cause pollution of the waters of the state through inappropriate disposal of solid waste. This proposed permit requires that the Permittee maintain a solid waste plan designed to prevent solid waste from causing pollution of the waters of the state (RCW 90.48.080).

D. Non routine and Unanticipated Discharges

Occasionally, this facility may generate wastewater that was not characterized in the permit application because it is not a routine discharge and was not anticipated at the time of application. These wastes typically consist of waters used to pressure-test storage tanks or fire water systems or of leaks from drinking water systems.

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

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

E. Spill Plan

This facility stores a quantity of chemicals on-site that have the potential to cause water pollution if accidentally released. Ecology can require a facility to develop best management plans to prevent this accidental release [Section 402(a)(1) of the Federal Water Pollution Control Act (FWPCA) and RCW 90.48.080].

The 200 Area TEDF 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 keep the plan updated and submit major changes to Ecology.

F. Best Management Practices

Best management practices (BMPs) are the actions identified to manage and prevent contamination of stormwater and groundwater. BMPs include 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 also include treatment systems, operating procedures, and practices used to control plant site runoff, spillage or leaks, sludge or waste disposal, and drainage from raw material storage.

G. Effluent Variability Study

The Hanford Tank Waste Treatment and Immobilization Plant (WTP) generates non-radioactive liquid waste streams that discharge to 200 Area TEDF. An engineering study has determined several of these waste streams cannot be fully characterized prior to their initial discharge to the 200 Area TEDF. Therefore, Special Permit Condition S9 requires DOE-RL to conduct a study in at least two seasonal phases (winter and summer) during initial testing and the first year of WTP operational discharges to TEDF for each Significant New Source. A Significant New Source is a new discharge to TEDF, which may not be fully characterized through sample analysis or process knowledge and may have a measurable impact on the 200 Area TEDF effluent. The 200 Area TEDF will determine which new streams are significant. The facility will contact Ecology when it identifies a significant new source discharge. If the facility is not certain if a new discharge is considered a Significant New Source, it must contact Ecology for a determination.

Specific objectives of the statistical evaluation include:

- Determining the overall variability of permitted constituents,
- Evaluating comparability of grab and composite samples, and
- Determining if concentrations of permitted constituents vary with season.

Results of the statistical evaluation will be used by Ecology to verify and/or to modify permit limits of the listed constituents in the effluent if needed. If conditions warrant, Ecology will issue an administrative order or permit modification to the Permittee to modify monitoring or other permit requirements. The results could also be used by

the Permittee to support a request for reduction in monitoring requirements where the requirements appear to be unnecessarily redundant or too extensive.

Effluent Variability Studies will consist of the following minimum requirements; the facility must:

- Collect weekly flow-composited samples for metals, anions, Total Dissolved Solids, and semi-volatile organics (if the collection of flow-composited samples isn't possible, it may collect grab samples).
- Collect five random grab samples per month and analyze for volatile organics and oil and grease.
- Continuously monitor pH, conductivity, and flow.
- Provide statistical evaluators such as the mean concentration, upper 95% confidence level, standard deviation, and coefficient of variation (or their equivalent).

DOE-RL must conduct these studies over the course of one calendar year and submit monitoring results for any significant new source discharge quarterly with Discharge Monitoring Reports. It must provide a final summary report with the results of the evaluation and any relevant or new information or recommendations to Ecology within one year of completion of the study. Ecology will use the report information and results to verify and/or modify the highest allowable concentrations for the discharge limits of the listed constituents in the effluent. Ecology may develop performance-based permit limits using the results of these studies.

The facility may apply to Ecology for a permit modification if the results of this study provide new information, which they were not aware of when submitting the original application.

New waste streams from the WTP will originate at the following facilities:

- Pretreatment Facility
- Low Activity Waste Facility
- Analytical Laboratory
- High Level Waste Facility
- Water Treatment Building, Steam Plant Facility
- Chiller/Compressor Plant
- Wet Chemical Storage Facility
- Maintenance Shop
- Pretreatment Chiller Plant and Cooling Tower
- A Cooling Tower Facility

Discharges from all of these facilities will flow into the Non-Radioactive Liquid Waste (NLD) Tank prior to discharge to the 200 Area TEDF.

H. General Conditions

Ecology bases the standardized general conditions on state law and regulations. They are included in all individual industrial state waste discharge permits issued by Ecology.

VII. Permit Issuance Procedures

A. Permit Modifications

Ecology may modify this permit to impose numerical limits, if necessary, to comply with water quality standards for groundwaters, based on new information from sources such as inspections, effluent monitoring, outfall studies, and effluent mixing studies.

Ecology may also modify this permit to comply with new or amended state regulations.

B. Proposed Permit Issuance

This proposed permit meets all statutory requirements for Ecology to authorize a wastewater discharge. The permit includes limits and conditions to protect human health and aquatic life, and the beneficial uses of waters of the state of Washington. Ecology proposes to issue this permit for a term of five years.

VIII. References for Text and Appendices

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December 1993. *State Waste Discharge Permit Application for Industrial Discharge to Land, 200 East Area W-252 Streams*, DOE/RL/93-61, Rev 0.

February 1992. *200 Area Treated Effluent Disposal Facility (Project W-049H) Wastewater Engineering Report*, WHC-SD-W049H-ER-003, Rev. 0, Volumes 1 and 2.

September 1992. *Phase II Liquid Effluent Program (Project W-252) Wastewater Engineering Report and BAT/AKART Studies*, WHC-SD-W252-ER-001, Rev. 0, and all subsequent Engineering Change Notices, 609362, 60936, and 607698.

Quarterly Discharge Monitoring Reports for the 200 Area TEDF, April 2005 through April 2011 reporting periods.

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1988. *Best Available Technology (Economically Achievable) Guidance Document for the Hanford Site*, WHC-EP-0137.

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Permit and Wastewater Related Information.

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Appendix A--Public Involvement Information

Ecology proposes to reissue a permit to the 200 Area Treated Effluent Disposal Facility (TEDF). The permit includes wastewater discharge limits and other conditions. This fact sheet describes the facility and Ecology's reasons for requiring permit conditions.

Ecology will place a Public Notice of Draft on Sunday, October 30 in the Tri-City Herald to inform the public and to invite comment on the proposed draft State Waste Discharge permit and fact sheet.

The notice:

- Tells where copies of the draft Permit and Fact Sheet are available for public evaluation (a local public library, the closest Regional or Field Office, posted on our website).
- Offers to provide the documents in an alternate format to accommodate special needs.
- Urges people to submit their comments, in writing, before the end of the Comment Period.
- Tells how to request a public hearing of comments about the proposed state waste discharge permit.
- Explains the next step(s) in the permitting process.

Ecology has published a document entitled *Frequently Asked Questions about Effective Public Commenting*, which is available on our website at <http://www.ecy.wa.gov/biblio/0307023.html>.

Further information may be obtained from Ecology by telephone, 509-372-7917, or by writing to the address listed below.

Water Quality Permit Coordinator
Department of Ecology
3100 Port of Benton Blvd.
Richland, WA 99354

The primary author of this permit and fact sheet is Stacy Nichols.

Appendix B --Your Right to Appeal

You have a right to appeal this permit to the Pollution Control Hearing Board (PCHB) within 30 days of the date of receipt of the final permit. The appeal process is governed by chapter 43.21B RCW and chapter 371-08 WAC. "Date of receipt" is defined in RCW 43.21B.001(2) (see glossary).

To appeal you must do the following within 30 days of the date of receipt of this permit:

- File your appeal and a copy of this permit with the PCHB (see addresses below). Filing means actual receipt by the PCHB during regular business hours.
- Serve a copy of your appeal and this permit on Ecology in paper form - by mail or in person. (See addresses below.) E-mail is not accepted.

You must also comply with other applicable requirements in chapter 43.21B RCW and chapter 371-08 WAC.

ADDRESS AND LOCATION INFORMATION

Street Addresses	Mailing Addresses
<p>Department of Ecology Attn: Appeals Processing Desk 300 Desmond Drive SE Lacey, WA 98503</p>	<p>Department of Ecology Attn: Appeals Processing Desk PO Box 47608 Olympia, WA 98504-7608</p>
<p>Pollution Control Hearings Board 1111 Israel RD SW STE 301 Tumwater, WA 98501</p>	<p>Pollution Control Hearings Board PO Box 40903 Olympia, WA 98504-0903</p>

Appendix C--Glossary

AKART -- The acronym for “all known, available, and reasonable methods of prevention, control, and treatment.” AKART is a technology-based approach to limit pollutants from wastewater discharges, which requires an engineering judgment and an economic judgment. AKART must be applied to all wastes and contaminants prior to entry into waters of the state in accordance with RCW 90.48.010 and 520, WAC 173-200-030(2)(c)(ii), and WAC 173-216-110(1)(a).

Alternate point of compliance -- An alternative location in the groundwater from the point of compliance where compliance with the groundwater standards is measured. It may be established in the groundwater at locations some distance from the discharge source, up to, but not exceeding the property boundary and is determined on a site specific basis following an AKART analysis. An “early warning value” must be used when an alternate point is established. An alternate point of compliance must be determined and approved in accordance with WAC 173-200-060(2).

Ambient water quality -- The existing environmental condition of the water in a receiving water body.

Annual average design flow (AADF) -- average of the daily flow volumes anticipated to occur over a calendar year.

Average monthly discharge limit -- The average of the measured values obtained over a calendar month's time.

Background water quality -- The concentrations of chemical, physical, biological or radiological constituents or other characteristics in or of groundwater at a particular point in time upgradient of an activity that has not been affected by that activity, [WAC 173-200-020(3)]. Background water quality for any parameter is statistically defined as the 95% upper tolerance interval with a 95% confidence based on at least eight hydraulically upgradient water quality samples. The eight samples are collected over a period of at least one year, with no more than one sample collected during any month in a single calendar year.

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.

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

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.

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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 for the purpose of determining the compliance of a facility with the terms and conditions of its permit or with applicable statutes and regulations. In addition it includes 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% removal requirement. Ecology may conduct additional sampling.

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.

Date of receipt -- This is defined in RCW 43.21B.001(2) as five (5) business days after the date of mailing; or the date of actual receipt, when the actual receipt date can be proven by a preponderance of the evidence. The recipient's sworn affidavit or declaration indicating the date of receipt, which is unchallenged by the agency, constitutes sufficient evidence of actual receipt. The date of actual receipt, however, may not exceed forty-five days from the date of mailing.

Detection limit -- See Method Detection Level.

Dilution factor (DF) -- 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, for example, a dilution factor of ten means the effluent comprises 10% by volume and the receiving water 90%.

Early warning value -- The concentration of a pollutant set in accordance with WAC 173-200-070 that is a percentage of an enforcement limit. It may be established in the effluent, groundwater, surface water, the vadose zone or within the treatment process. This value acts as a trigger to detect and respond to increasing contaminant concentrations prior to the degradation of a beneficial use.

Enforcement limit -- The concentration assigned to a contaminant in the ground water at the point of compliance for the purpose of regulation, [WAC 173-200-020(11)]. This limit assures that a ground water criterion will not be exceeded and that background water quality will be protected.

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

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

Ground water -- Water in a saturated zone or stratum beneath the surface of land or below a surface water body.

Industrial user -- A discharger of wastewater to the sanitary sewer that is not sanitary wastewater or is not equivalent to sanitary wastewater in character.

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.

Maximum daily discharge limit -- 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.

Maximum day design flow (MDDF) -- The largest volume of flow anticipated to occur during a one-day period, expressed as a daily average.

Maximum month design flow (MMDF) -- The largest volume of flow anticipated to occur during a continuous 30-day period, expressed as a daily average.

Maximum week design flow (MWDF) -- The largest volume of flow anticipated to occur during a continuous seven (7)-day period, expressed as a daily average.

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

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. It is the negative logarithm of the hydrogen ion concentration. A pH of 7 is defined as neutral and large variations above or below this value are considered harmful to most aquatic life.

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Peak hour design flow (PHDF) -- The largest volume of flow anticipated to occur during a one-hour period, expressed as a daily or hourly average.

Peak instantaneous design flow (PIDF) -- The maximum anticipated instantaneous flow.

Point of compliance -- The location in the groundwater where the enforcement limit must not be exceeded and a facility must comply with the Ground Water Quality Standards. Ecology determines this limit on a site-specific basis. Ecology locates the point of compliance in the ground water as near and directly downgradient from the pollutant source as technically, hydrogeologically, and geographically feasible, unless it approves an alternative point of compliance.

Quantitation level (QL) -- Also known as Minimum Level of Quantitation (ML) – The lowest level at which the entire analytical system must give a recognizable signal and acceptable calibration point for the analyte. It is equivalent to the concentration of the lowest calibration standard, assuming that the lab has used all method-specified sample weights, volumes, and cleanup procedures. The QL is calculated by multiplying the MDL by 3.18 and rounding the result to the number nearest to $(1, 2, \text{ or } 5) \times 10^n$, where n is an integer. (64 FR 30417).

ALSO GIVEN AS:

The smallest detectable concentration of analyte greater than the Detection Limit (DL) where the accuracy (precision & bias) achieves the objectives of the intended purpose. (Report of the Federal Advisory Committee on Detection and Quantitation Approaches and Uses in Clean Water Act Programs Submitted to the U.S. Environmental Protection Agency December 2007).

Reasonable potential -- A reasonable potential to cause a water quality violation, or loss of sensitive and/or important habitat.

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).

Solid waste -- All putrescible and non-putrescible solid and semi-solid wastes including, but not limited to, garbage, rubbish, ashes, industrial wastes, sludge, sewage sludge, demolition and construction wastes, abandoned vehicles or parts thereof, contaminated soils and contaminated dredged material, and recyclable materials.

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

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of a storm water drainage system into a defined surface water body, or a constructed infiltration facility.

Technology-based effluent limit -- A permit limit based on the ability of a treatment method to reduce the pollutant.

Total dissolved solids--That portion of total solids in water or wastewater that passes through a specific filter.

Upset -- An exceptional incident in which there is unintentional and temporary noncompliance with technology-based permit effluent limits 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 imposed on the concentration of an effluent parameter to prevent the concentration of that parameter from exceeding its water quality criterion after discharge into receiving waters.

Appendix D--Technical Calculations

Enforcement Limit Derivation Summary

Constituent or Characteristic	Enforcement Limit	Point of Compliance	Type of Limit	Rationale/ Method of Derivation
Bis (2-ethylhexyl) phthalate	10 µg/l	Effluent	Water quality-based	Criteria too low to discern (reliably) in laboratory. Limit set at PQL
Total trihalomethanes	20 µg/l	Effluent	Technology-based	Criteria met. Limit set at PQL.
Carbon tetrachloride	5 µg/l	Effluent	Water quality-based	Criteria too low to discern (reliably) in laboratory. Limit set at PQL.
Chloroform	7 µg/l	Effluent	Water quality-based	Limit set at criteria.
Methylene chloride	5 µg/l	Effluent	Technology-based	Criteria met. Limit set at PQL, which also happens to be the criteria.
Arsenic	15 µg/l	Effluent	Water quality-based	Criteria too low to discern (reliably) in laboratory. Limit set at PQL.
Cadmium	5 µg/l	Groundwater	Technology-based	Criteria met. Limit set at PQL.
Chromium	20 µg/l	Effluent	Technology-based	Criteria met. Limit set at PQL. Background groundwater value may exceed criteria.
Iron	300 µg/l	Groundwater	Water quality-based	Criteria normally met. Background groundwater value may exceed criteria.

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Constituent or Characteristic	Enforcement Limit	Point of Compliance	Type of Limit	Rationale/ Method of Derivation
Lead	10 µg/l	Groundwater	Technology-based	Criteria met. Limit set at PQL.
Manganese	50 µg/l	Effluent	Technology-based	Criteria met. Limit set at PQL.
Mercury	2 µg/l	Effluent	Technology-based	Criteria met. Limit set at PQL.
Chloride	58 mg/l	Effluent	Technology-based	Criteria met. Limit set at as low a level as source and technology controls can achieve.
Nitrate (as N)	620 µg/l	Effluent	Technology-based	Criteria met. Limit set at as low a level as source and technology controls can achieve.
Total dissolved solids	500 mg/l	Effluent	Water quality-based	Limit set at criteria.
pH, in pH units	6.5 to 8.5	Groundwater and Effluent	Water quality-based	Criteria met. Range provided due to natural variability in groundwater.

Appendix E--Response to Comments



DEPARTMENT OF
ECOLOGY
State of Washington

Response to Comments

**Waste Water Discharge Permit for
Hanford's 200 Area Treated Effluent
Disposal Facility**

October 31 – December 28, 2011

Summary of a public comment period and responses to comments

May 2012
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Ecology publishes this document to meet the requirements of [Washington Administrative Code 173-303-840 \(9\)](#).

If you need this document in a format for the visually impaired, call the Nuclear Waste Program at 509-372-7950. Persons with hearing loss can call 711 for Washington Relay Service. Persons with a speech disability can call 877-833-6341.

Response to Public Comments

**Waste Water Discharge Permit for Hanford's 200 Area
Treated Effluent Disposal Facility
October 31 – December 28, 2011**

Department of Ecology
Nuclear Waste Program
3100 Port of Benton Boulevard
Richland, Washington 99354

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Introduction

The Washington State Department of Ecology requires industrial facilities in the state to have a permit before discharging waste or chemicals to the waters of the state, including groundwater. When a new permit or a significant change to an existing permit is proposed, we hold a public comment period to allow the public to review the change and provide formal feedback.

The Response to Comments is the last step before issuing the final permit, and its purpose is to:

- Specify which provisions, if any, of a permit will become effective upon issuance of the final permit, providing reasons for those changes.
- Describe and document public involvement actions.
- List and respond to all significant comments received during the public comment period and any related public hearings.

This Response to Comments is prepared for:

Comment period: Waste Water Discharge permit for Hanford's 200 Area Treated Effluent Disposal Facility
Permit: ST0004502
Original issuance date: 1995
Draft effective date: July 1, 2012

To see more information related to this rule making or other Ecology rule makings, please visit our website: www.ecy.wa.gov/lawsandrules.

Reasons for Issuing the Permit

The permit protects groundwater by regulating how wastewater is discharged to the ground.

Ecology proposes to renew a State Waste Discharge Permit for discharge of wastewater via infiltration through soils to the groundwater of the state. The disposal facility's named is the 200 Area Treated Effluent Disposal Facility. The permittee is the U.S. Department of Energy (USDOE), Richland Operations Office.

The TEDF is a pipe collection system. It does not have any treatment or retention capacity. Strict controls at the generating facilities are essential to operate in compliance with the permit. The facility is located in and near the 200 East and West Areas. It consists of a twelve-mile-long pipeline, three lift stations, a sample station (Building 6653), and two adjacent five-acre infiltration ponds. Water near the ponds is found as groundwater at a depth of about 100 to 120 feet. Computer modeling of groundwater flow estimates it takes 10 to 300 years for the effluent to reach the Columbia River.

The effluent consists of individual waste streams from several Hanford facilities. None of these individual waste streams involve direct contact of the water with industrial processes. Effluents are primarily from:

- Ventilation, heating, and cooling systems for the buildings.
- Steam condensate from heating potable (drinkable) water.
- Condensate of pressurized potable water.
- Rainwater.
- Untreated Columbia River water.

All of the facilities have been subjected to an extensive program of source controls (pollution prevention) to eliminate or reduce about 85% of prior contaminant loadings. The permittee has built effluent treatment systems at some of the facilities that discharge to the 200 Area TEDF.

We reviewed the original permitting of the disposal facility's effluent under Washington's State Environmental Policy Act (SEPA) in November 1993. The permittee completed an environmental checklist at that time. We made a determination of nonsignificance under SEPA. No one submitted comments during the public comment period. We completed another determination of nonsignificance on December 6, 2011. We reconsidered the impacts because of the increases from the Waste Treatment Plant. We received no comments during the comment period for the latest review.

The draft permit complies with the regulatory requirements of [Chapter 173-200 of the Washington Administrative Code](#) (WAC) - Water Quality Standards for Ground Waters of the State of Washington. This regulation is premised on the fact that all contaminants should be regulated to protect all existing and future beneficial uses of the groundwater. Because the use of drinking water is the most restrictive and protective, this regulation and the draft permit protect the groundwater for drinking water purposes.

The draft permit establishes enforcement limits for nonradioactive contaminants or maximum allowable concentration levels in the effluent and groundwater that are essentially drinking water standards. Hence, the permit requires that the effluent meets drinking water standards for nonradioactive contaminants before discharge to the infiltration ponds.

In the case of this permit, the permittee is self-regulating for radioactive contaminants under the provisions of the Atomic Energy Act. The permittee plans to meet the intent of the Code of Federal Regulations, [Title 40, Part 141](#), "National Primary Drinking Water Regulations," for radioactive contaminants, and plans to take investigative and mitigating steps if drinking water standards are exceeded. The permittee reports radionuclide concentrations in the effluent to Ecology.

Public Involvement Actions

Ecology strives to make its decisions transparent and accessible to the people we work for. For this permit, we carried out the following activities:

- Notified regional stakeholders via the [public involvement calendar](#) prepared for the Hanford Advisory Board's Public Involvement Committee.
- Gave advance notification on Ecology's [Nuclear Waste Program website](#).
- Sent advance notification to the [Hanford-Info email list](#) on September 23, 2011.

- Mailed a public notice to Hanford's postal list and emailed it to the Hanford-Info email list.
- Put copies of the public notice in Ecology's Nuclear Waste Program office lobby.
- Published public notice in legal classified ad in the *Tri-City Herald* on Sunday, October 30, 2011.
- Posted the comment period as an event on Ecology's [Hanford Education & Outreach Facebook page](#) on November 7, 2011.
- Posted the comment period on [Ecology's public events online calendar](#).
- Sent public notice and disk with the permit and fact sheet to Hanford's five public information repositories, plus the Richland Public Library.
- Extended the comment period 30 days to enable the public's review of the permit to continue during the comment period for the permit's State Environmental Policy Act determination.

Though not an Ecology action, we also know that Hanford Challenge posted our announcements on its Facebook page.

The following public notices for this comment period are in Appendix A of this document:

1. Public notice in legal classified ad in the *Tri-City Herald*.
2. Print public notice.
3. Advance notification to the Hanford-Info email list.
4. Comment period extension notice to the Hanford-Info email list.

Response to Comments

Ecology accepted comments between October 31, 2011, and December 28, 2011. We received four comments from the public. All came via email. We responded via email to each commenter (See Appendix A). We also received a compilation of comments from the permittee.

Most of the public's comments were questions about putting radioactive water into the ground. John Howieson questioned the location of the point of compliance. We agreed with his position and had already moved the point of compliance.

The permittee's comments included several corrections to facts and descriptions. The permittees also requested a reduction of the limit for iron discharges, which we rejected. We also rejected the permittee's recommendation to change the date that variability study plans are due.

Below the comments are printed as we received them. Our responses follow each comment.

September 24, 2011

John Howieson

I would like to question the wisdom of moving the point of compliance for the iron limit from the effluent to Groundwater Monitoring Wells 699-40-36, 699-41-35, and 699-42-37. Would this not mean that by the time the contamination was detected in the wells the vadose zone would have been subjects to a large load of contaminant? If so, the situation would then require remediation. Surely prevention is preferable to cure. Please reconsider.

Response: The draft permit has been revised since you reviewed the initial listserv notice. The point of compliance for iron is no longer in the groundwater. In fact, all points of compliance have

been moved to the effluent sampling station. If any contamination were to occur, it would be detected prior to reaching the groundwater. Groundwater monitoring has been discontinued in this permit. We determined that Wells 699-40-36, 699-41-35, and 699-42-37 are not in the right aquifer to monitor TEDF discharges. These wells are still part of the 200-PO-1 and site wide surveillance monitoring plans.

November 3, 2011

Pamela Lumpkins

Have any of the liquids from the Hanford 200 Area TEDF become radioactive?

Response: Liquids discharging to the 200 Area Treated Effluent Disposal Facility (TEDF) have not become radioactive. Although this draft permit includes new waste streams from the Waste Treatment and Immobilization Plant, the flows permitted to discharge to the 200 Area TEDF are not radioactive.

November 29, 2011

Jeanne Raymond

I hope you are not seriously considering releasing waste water from a treatment plant, which has a risk of being contaminated, into holding ponds that could access the Columbia River. The risk seems too great. If this is the case, I would certainly recommend against renewing the permit.

Response:

The permit ensures the water being discharged protects groundwater by meeting drinking water standards. The water being discharged is not contaminated. The kinds of waste water that enter the facility are those associated with ventilation, heating, and cooling systems for the buildings; steam condensate from heating potable (drinkable) water; condensate of pressurized potable water; rainwater; and untreated Columbia River water.

December 14, 2011

Mason Taylor

Is any of the water to be treated radioactive? Has it been used to cool nuclear reactor? Is it part of the "cooling system" designed to prevent meltdown? Has it been used to cool down radioactive waste? If the water is radioactive, how does the treatment remove the radioactive material from the water? Thank you.

Response: None of the water entering the Treated Effluent Disposal Facility is radioactive, nor has it ever been used in a nuclear reactor. It has not been in contact with any radioactive waste.

The waste liquid comes from the following:

- * Ventilation, heating, and cooling systems for the buildings.
- * Steam condensate from heating potable (drinkable) water.
- * Condensate of pressurized softened or deionized potable water.
- * Rainwater from parking lots and exterior paved areas.
- * Potable (treated) water.
- * Untreated Columbia River water.
- * Boiler blowdown.
- * Floor drains with limited and strictly controlled usage.

December 13, 2011

Rick Engelman (USDOE) on behalf of Permittees

The following comments on the October 2011 Fact Sheet and draft State Waste Discharge Permit Number ST0004502 are from a coordinated review by USDOE, Richland Operations Office (RL), the DOE Office of River Protection (ORP), and affected Hanford Site contractors.

Fact Sheet Comments:

1. Summary, first paragraph (p. 1) states “water in close proximity to the ponds is found as groundwater at a depth of about 100 to 120 feet below the surface.” This should state “about 140 feet.”

Response: Accepted; made the recommended change.

2. Summary, first paragraph last sentence (p. 2) states that groundwater estimated travel time to the Columbia River is approximately 10 to 300 years. This appears to be a mistake in that III.B, top of page 19 states travel times are “approaching 120 to 300 years.” Please correct or clarify.

Response: Accepted; changed “10 to 300” to “120 to 300” in the first paragraph of p.2.

3. Section III A., Table 2. 222-S Laboratory complex no longer discharges steam condensate. Replace steam condensate with rainwater for consistency with the permit.

Response: Accepted; made the recommended change.

4. Section III A., Wastewater Treatment Processes, second bullet, 222 S Laboratory Effluent. Delete steam condensate from this paragraph as steam is no longer utilized at the 222-S laboratory.

Response: Accepted; deleted reference to steam.

5. Section III B., Description of the Groundwater, 2nd paragraph should read “The thickness of the formation varies from 90 to 100 feet.”

Response: Accepted; made the recommended change.

6. Section III B., Description of the Groundwater, 3rd paragraph needs thicknesses corrected as follows: “The lower part of the Ringold Formation, below this Lower Mud Sequence, consists of an 80 to 120 (approximate) foot thick zone of silty sandy gravel named Unit A.... The static water level in wells completed within the uppermost aquifer currently varies from 113 to 123 feet below the surface.”

Response: Accepted; made the recommended changes.

7. Section III B., Description of the Groundwater, 5th paragraph needs correction: “Groundwater flows down-gradient toward the southwest at a flow rate of less than one foot per day in the uppermost aquifer beneath the TEDF. Hydrologic tests and recent head measurements indicate that the groundwater flow may be less than 0.01 feet per day. Groundwater currently flows toward the west from the 216-B-3 Pond complex (located west-northwest of 200 Area TEDF) with a hydraulic gradient of about 0.0014 foot per foot. Water levels in the area are currently declining at a rate of about 0.2 feet per year.”

Response: Accepted; made the recommended changes.

8. Section III B., Description of the Groundwater, 8th paragraph should read: “The May Junction Fault is located approximately one mile east from 200 Area TEDF. It trends

north-south with the east side displaced vertically downward about 185 feet. It is possible that the fault may hydraulically connect the confined aquifer in the Unit A gravel of the Ringold formation with water perched in the Hanford formation at the top of the Lower Mud Sequence, but it is also possible that mud has smeared along the fault zone sealing the fault and blocking this pathway. Recent research makes it appear likely that the May Junction Fault is an impediment to eastward movement of groundwater in the Ringold (confined) aquifer.”

Response: Accepted; made the recommended changes.

9. Section III D., Table 5. Table 5 indicates the O&M Manual Review Letter is to be submitted annually. The table shows 8/10/10 was the last submittal date. Please change the last submittal date to 8/10/11.

Response: Revised, corrected the submittal date.

10. Section IV. C Table 8. An enforcement limit of 0.3 mg/l total iron is proposed [see also draft permit ST 4502, Section S1.A.(Table)]. This limit is a drinking water limit based criterion from WAC 173-200-040, Table 1. In the past RL has occasionally had problems meeting this standard at 200 Area TEDF. RL believes this limit is too restrictive, and not justified by regulation. Continuing to maintain an iron enforcement level at 0.3 mg/l is not necessary for protection of human health or the environment, and is unreasonably burdensome in that it forces RL to meet a standard that historically has occasionally been difficult to obtain. RL proposes that iron be dropped as an enforcement limit, and to monitor only for trending and tracking purposes.

Response: Ecology rejects this proposal. The proposed enforcement limit of 0.30 mg/l for iron is justified by regulation. The Ground Water Quality Criteria (WAC 173-200-040) are established to protect ground waters of the state to the highest standards for current and future beneficial uses. In the case of iron, the limit protects ground water to drinking water standards. The fact that this ground water is not used for drinking water does not mean the established enforcement limit does not apply. In addition, RL has concluded the iron in its system is coming from rusty pipes, not background water already high in iron. Facilities are responsible for maintaining their distribution system. If old and rusty pipes are resulting in effluent exceedences, this should be addressed. Iron cannot be removed from the permit because a facility cannot meet the standard established in WAC 173-200-040.

Basis for rejection:

- As described in the first ST 4502 Fact Sheet (issued with the original permit in 1995), and the Fact Sheet issued with the permit renewal (issued in May 2000), background iron groundwater concentrations in the upper most aquifer below 200 Area TEDF exceeded groundwater (drinking water) criteria. “These exceedences are thought to be due to natural, not man-made causes.” As presented in Table 8 in the current Fact Sheet, average background iron concentrations in the three wells ranged from 17.0 to 0.9 mg/l.
- Per WAC 173-200-050 (3) (b), for situations such as these it is appropriate for the enforcement level to be set at a higher level. WAC 173-200-050 (3) (b) (i) states “When the background ground water quality exceeds the criterion, the enforcement limit for that contaminant shall be equal to the natural level.”
- The WAC 173-200-040, Table 1 iron criterion is based on EPA secondary drinking water standards. These are considered by EPA to be non-mandatory, and have been established “...only as guidelines to assist public water systems in managing their drinking water for aesthetic considerations, such as taste, color and odor.” For iron, the noticeable effects

above the secondary drinking water standard are “rusty color; sediment; metallic taste; reddish or orange staining.” See

<http://water.epa.gov/drink/contaminants/secondarystandards.cfm>

- The upper most aquifer is not used as a drinking water source.

Draft Permit Comments:

1. The summary Table on page 2 lists steam condensate for 222-S Laboratory. Please delete steam condensate. Basis: Steam is no longer utilized at the 222-S Laboratory

Response: Accepted; deleted references to steam.

2. The Summary of Permit Report Submittals (page 5) states permit violation reports are to be submitted “Within 5 days upon discovery of a noncompliance, or such other time as may be agreed to by Ecology.” This appears to be in contradiction to S3.E.2.d, which allows for noncompliance outside the scope of S3.E.a. noncompliance to be reported with the submittal of monitoring reports required by S3.A. The table should be corrected to show that for some noncompliance situations, submittal of the report with monitoring reports is acceptable.

Response: Rejected; the statement “or such other time as may be agreed to by Ecology” can refer to reporting certain noncompliances on DMR cover sheets.

3. S1.A. Effluent limits. The iron limits in the table should be removed as requested in Fact Sheet comment 10.

Response: Ecology rejects this proposal; see response to Fact Sheet Comment #10.

4. S1.A Table, Note b. The second sentence needs clarification: “For other units of measurement, the daily discharge is the average measurement of the pollutant over the day”

Response: Accepted; deleted the last two sentences in Note b because they did not relate to the maximum effluent limits in this permit.

5. S2.A Table and S2.C table: The QLs listed for oil and grease, arsenic, cadmium, chromium, lead, sulfate and total dissolved solids are lower than the WSCF laboratory QLs. The WSCF MDL does meet the QL. RL recommends changing the QLs to match the laboratory MDLs or provide a statement that the MDL is an acceptable substitute.

Response: Agreed. Added note to the table stating: Where the laboratory MDL meets the QL in the above table, the laboratory MDL may be used as a substitute for the QL.

6. S2.A Table and S2.C Table reference the laboratory method for iron as SW-846-8260. This method is for volatile organics. The method should be corrected to SW-846-6010 which is for metals by ICP-AES.

Response: Accepted; made the revision to the method.

7. S.2.E.1, E.3, E.6 and E.7. define continuous monitoring devices as flow, pH and conductivity. Section S.2.E.3 says “calibrate continuous pH and conductivity monitoring instruments weekly”, Section S.2.E.6 says “calibrate these devices at the frequency recommended by the manufacturer”, and Section S.2.E.7 says “calibrate flow monitoring devices at a minimum frequency of at least one calibration per year”. RL believes the intent is to calibrate pH and conductivity instruments weekly and flow instruments annually. Please clarify.

Response: Accepted; made clarifications as noted above.

8. S.2.E.4 says perform calibration of the pH meter by pulling a process sample and measuring the pH of the process sample using a second pH probe which has been calibrated using standard buffers. The current TEDF maintenance procedure is to temporarily remove the pH meter and place it in the standard buffers. This provides a better calibration (two-point rather than one-point) and doesn't require a second pH probe. Please revise or clarify that the current calibration method is acceptable.

Response: Accepted; deleted condition. Calibration to ensure accuracy is already required under S2.E.2.

9. S3.E 2.a(7) The twenty four hour reporting requirement for monitoring wells is no longer required and should be deleted.

Response: Accepted; deleted condition.

10. S.9 The requirement to submit variability study plans within 60 days of permit issuance does not match the WTP discharge schedule. The current baseline schedule for discharge is March of 2013 and Ecology will be updated if the schedule changes. It is recommended that this requirement be changed to submit variability study plans 60 days prior to the planned discharge date for WTP.

Response: Rejected; sampling plan can be submitted long before actual WTP discharges begin. Submitting this plan only 60 days before scheduled discharges will not allow sufficient time for Ecology review and subsequent changes or revisions to the document(s), if needed.

List of Commenters

The table below lists the names of organizations or individuals who submitted a comment on the permit renewal for the 200 Area Treated Effluent Disposal Facility and where you can find Ecology's response to the comment(s).

Commenter	Where the comment is addressed in this document
John Howieson	Pages 4–5
Pamela Lumpkins	Page 5
Jeanne Raymond	Page 5
Mason Taylor	Pages 5–6
Richard Engelmann, USDOE	Pages 6–9

Appendix A: Copies of all public notices

SUNDAY, OCTOBER 30, 2011 | TRI-CITY HERALD

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Classified Legals

Public Comment Permit

The Department of Ecology invites public comment on a waste water discharge permit for Hanford's 200 Area Treated Effluent Disposal Facility (TEDF). The comment period is October 31 to November 30, 2011.

State laws require any industrial facility to have a permit before discharging waste or chemicals to the waters of the state, including groundwater. The liquids that TEDF treats are from ventilation and heating and cooling systems, steam condensate from drinkable water, rainwater, and untreated Columbia River water. They come from various facilities at Hanford. They are discharged to two 5-acre infiltration ponds east of Hanford's 200 East Area.

The draft permit ensures the discharged liquids protect all existing and future beneficial uses of the groundwater. It protects the groundwater for drinking water purposes.

It requires best management practices, a spill plan, and monitoring of the effluents.

The permittee is the U.S. Department of Energy - Richland Operations Office. This is a permit renewal. The first State Waste Discharge Permit for TEDF was issued in 1995. The permittee has complied with the permit since then.

What's next?

After we receive public comments, we will revise the permit if warranted. We'll add the comments and responses to the fact sheet. We will also prepare a responsiveness summary. We don't plan to hold a public meeting, but if there is strong interest we will reconsider.

You can email, mail, or hand-deliver your comments to Stacy Nichols. We prefer email. The deadline for comments is November 30, 2011. Send comments to snich461@ecy.wa.gov or 3100 Port of Benton Blvd, Richland, WA 99354.

You can find the permit and related materials at the Richland Public Library, the Department of Ecology's nuclear waste program office (3100 Port of Benton Blvd, Richland, 99354.) You can also find them online at www.ecy.wa.gov/programs/nwpl/comment/periods.htm or at any of Hanford's public information repositories:

Portland
Portland State University
Branford Price Miller Library
1875 SW Park Ave.
Attn: Claudia Weston
503-725-4542

Richland
U.S. Department of Energy
Reading Room
Consolidated* Information Center, Room 101-L
2770 University Dr.
Attn: Janice Parthree
509-372-7443

Spokane
Gonzaga University
Foley Center
502 E Boone Ave.
Attn: Linda Fiorca
509-313-3834

Seattle
University of Washington
Suzzallo Library
Government Publications Division
Attn: Cass Harlett
206-543-4363
#11-3034, 10/30/2011

Figure 1. Legal classified notice on October 30, 2011

Waste water discharge permit for Hanford

The Department of Ecology invites public comment on a waste water discharge permit for Hanford's 200 Area Treated Effluent Disposal Facility (TEDF).

Background

State laws require any industrial facility to have a permit before discharging waste or chemicals to the waters of the state, including groundwater.

The liquids that TEDF treats are from ventilation and heating and cooling systems, steam condensate from drinkable water, rainwater, and untreated Columbia River water. They come from various facilities at Hanford. They are discharged to two 5-acre infiltration ponds east of Hanford's 200 East Area.

The draft permit ensures the discharged liquids protect all existing and future beneficial uses of the groundwater. It protects the groundwater for drinking water purposes. It requires best management practices, a spill plan, and monitoring of the effluents.

The permittee is the U.S. Department of Energy – Richland Operations Office. This is a permit renewal. The first State Waste Discharge Permit for TEDF was issued in 1995. The permittee has complied with the permit since then.

What's next?

After we receive public comments, we will revise the permit if warranted. We'll add the comments and responses to the fact sheet. We will also prepare a responsiveness summary. We don't plan to hold a public meeting, but if there is strong interest we will reconsider.

WHY IT MATTERS

The permit protects groundwater by regulating how wastewater is discharged to the ground.

Public Comment Period:

October 31 – November 30, 2011

Submit comments to:

Stacy Nichols
3100 Port of Benton Blvd
Richland, WA 99354
509-372-7917
hanford@ecy.wa.gov

Document review locations:

Richland Public Library
955 Northgate Boulevard
Richland, WA 99352
509-942-7457

Department of Ecology Nuclear Waste Program

3100 Port of Benton Blvd
Richland, WA 99354
(Call 509-372-7920 for appointment)

Hanford's information repositories (see page 2)

Ecology's Nuclear Waste Program website

[www.ecy.wa.gov/programs/nwp/
commentperiods.htm](http://www.ecy.wa.gov/programs/nwp/commentperiods.htm)

Special accommodations

If you need this publication in an alternative format, call 509-372-7950. Persons with hearing loss, call 711 for Washington Relay Service. Persons with speech disability call 877-833-6341.

Public Comment Period
October 31 – November 30, 2011
Wastewater Discharge Permit

How do I submit comments?

You can email, mail, or hand-deliver your comments to Stacy Nichols (see the sidebar on page 1). We prefer email. The deadline for comments is November 30, 2011.



Treated Effluent Disposal Facility "A" Pond

**Hanford Public
Information Repositories**

Portland

Portland State University
Branford Price Millar Library
1875 SW Park Ave.
Attn: Claudia Weston 503-725-4542

Richland

U.S. Department of Energy Reading Room
Consolidated Information Center, Room 101-L
2770 University Dr.
Attn: Janice Parthree 509-372-7443

Spokane

Gonzaga University
Foley Center, 502 E Boone Ave.
Attn: Linda Pierce 509-313-3834

Seattle

University of Washington Suzzallo Library
Government Publications Division
Attn: Cass Hartlett 206-543-4363

Figure 2. Public notice mailed, emailed, posted and displayed (page 2 of 2).

Brown, Madeleine (ECY)

From: McFadden, Daina (ECY) <dmc461@ECY.WA.GOV>
Sent: Friday, September 23, 2011 3:40 PM
To: HANFORD-INFO@LISTSERV.WA.GOV
Subject: Public Comment Period for Renewal of State Waste Discharge Permit ST0004502 (Treated Effluent Disposal Facility)

**The Washington State Department of Ecology Announces a
30-Day Public Comment Period for Renewal of State Waste Discharge Permit ST0004502
(Treated Effluent Disposal Facility)**

October 17 through November 18, 2011

The Washington State Department of Ecology is proposing a permit renewal of the 200 Area Treated Effluent Disposal Facility (TEDF) State Waste Discharge Permit ST0004502. The permittee is the U.S. Department of Energy – Richland Operations Office (USDOE-RL), P.O. Box 550, Richland, Washington, 99352.

A 30-day public comment period is scheduled to begin October 17 and end November 18, 2011.

Why It Matters

The 200 Area TEDF collects and disposes of wastewater to the ground via two infiltration ponds. The effluent consists of individual waste streams from several Hanford facilities. State regulations require all contaminants be regulated to protect all existing and future beneficial uses of the groundwater.

Changes to the Existing Permit

Proposed changes to this draft permit include:

- Raising the monthly average effluent limit for Total Dissolved Solids from 250 mg/l to 500 mg/l,
- Adding a major waste stream contributor from the Hanford Balance of Facilities/Waste Treatment Plant
- Moving the point of compliance for the iron limit from the effluent to Groundwater Monitoring Wells 699-40-36, 699-41-35, and 699-42-37.

The above description is a brief summary of the proposed draft permit. To review the proposed draft permit and fact sheet in detail beginning October 17, 2011, visit the Washington State Department of Ecology website, or visit one of the Information Repositories or Administrative Records.

Your views and concerns are important to us. For more information on the upcoming public comment period, please contact Madeleine Brown at (509) 372-7936, call the toll-free Hanford Cleanup Line at 1-800-321-2008 or email Hanford@ecy.wa.gov.

Figure 3. Advance notice email to Hanford stakeholders.

Brown, Madeleine (ECY)

From: Brown, Madeleine (ECY)
Sent: Wednesday, December 14, 2011 10:12 AM
To: hanford-Info@listserv.wa.gov
Subject: comment period extension for waste water discharge permit

This is a message from Washington's Department of Ecology.

Comment period is extended until December 28 for the waste water discharge permit for Hanford's 200 Area Treated Effluent Disposal Facility. The extension is to allow the public's review to consider our determination under the State Environmental Policy Act (SEPA). You can find the SEPA determination [here](#).

Below is information we issued already about the proposed permit.

The Department of Ecology invites public comment on a waste water discharge permit for Hanford's 200 Area Treated Effluent Disposal Facility (TEDF). The comment period is October 31 to November 30, 2011.

State laws require any industrial facility to have a permit before discharging waste or chemicals to the waters of the state, including groundwater.

The liquids that TEDF treats are from ventilation and heating and cooling systems, steam condensate from drinkable water, rainwater, and untreated Columbia River water. They come from various facilities at Hanford. They are discharged to two 5-acre infiltration ponds east of Hanford's 200 East Area.

The draft permit ensures the discharged liquids protect all existing and future beneficial uses of the groundwater. It protects the groundwater for drinking water purposes.

It requires best management practices, a spill plan, and monitoring of the effluents.

The permittee is the U.S. Department of Energy – Richland Operations Office. This is a permit renewal. The first State Waste Discharge Permit for TEDF was issued in 1995. The permittee has complied with the permit since then.

What's next?

After we receive public comments, we will revise the permit if warranted. We'll add the comments and responses to the fact sheet. We will also prepare a responsiveness summary. We don't plan to hold a public meeting, but if there is strong interest we will reconsider.

You can email, mail, or hand-deliver your comments to Stacy Nichols. We prefer email. The deadline for comments is November 30, 2011. Send comments to snic461@ecy.wa.gov or 3100 Port of Benton Blvd, Richland, WA 99354.

You can find the permit and related materials at the Richland Public Library, the Department of Ecology's nuclear waste program office (3100 Port of Benton Blvd, Richland, 99354.) You can also find them online at www.ecy.wa.gov/programs/nwp/commentperiods.htm or at any of Hanford's public information repositories:

Portland

Portland State University
Branford Price Millar Library
1875 SW Park Ave.
Attn: Claudia Weston 503-725-4542

Figure 4. Comment period extension email notice (page 1 of 2)

Richland

U.S. Department of Energy Reading Room
Consolidated Information Center, Room 101-L
2770 University Dr.
Attn: Janice Parthree 509-372-7443

Spokane

Gonzaga University
Foley Center, 502 E Boone Ave.
Attn: Linda Pierce 509-313-3834

Seattle

University of Washington Suzzallo Library
Government Publications Division
Attn: Cass Hartlett 206-543-4363

Madeleine C. Brown

Washington Department of Ecology
Nuclear Waste Program
Mabr461@ecy.wa.gov
(509) 372-7936

Figure 4. Comment period extension email notice (page 2 of 2).

Appendix B: Copies of all written comments

Nichols, Stacy (ECY)

From: Nichols, Stacy (ECY)
Sent: Tuesday, January 03, 2012 1:53 PM
To: 'howiesoj@comcast.net'
Cc: Brown, Madeleine (ECY); Bohrmann, Dieter (ECY); Holmes, Erika (ECY); Bond, Rick (ECY)
Subject: State Waste Discharge Permit ST0004502 (Treated Effluent Disposal Facility)

The draft permit has been revised since you reviewed the initial listserv notice. The point of compliance for iron is no longer in the groundwater. In fact, all points of compliance have been moved to the effluent sampling station. If any contamination were to occur, it would be detected prior to reaching the groundwater. Groundwater monitoring has been discontinued in this permit. We determined that Wells 699-40-36, 699-41-35, and 699-42-37 are not in the right aquifer to monitor TEDF discharges. These wells are still part of the 200-PO-1 and site wide surveillance monitoring plans.

From: John Howieson [<mailto:howiesoj@comcast.net>]
Sent: Saturday, September 24, 2011 3:48 PM
To: Hanford@ecy.wa.gov
Cc: Maye Thompson
Subject: State Waste Discharge Permit ST0004502 (Treated Effluent Disposal Facility)

To the WA Dept. of Ecology:

I would like to question the wisdom of moving the point of compliance for the iron limit from the effluent to Groundwater Monitoring Wells 699-40-36, 699-41-35, and 699-42-37. Would this not mean that by the time the contamination was detected in the wells the vadose zone would have been subjects to a large load of contaminant? If so, the situation would then require remediation. Surely prevention is preferable to cure. Please reconsider.

John Howieson MD
Oregon Physicians for Social Responsibility

Nichols, Stacy (ECY)

From: Nichols, Stacy (ECY)
Sent: Monday, November 14, 2011 10:29 AM
To: 'Lumpkins, Pamela'
Subject: RE: Hanford

Ms. Lumpkins,

Liquids discharging to the 200 Area Treated Effluent Disposal Facility (TEDF) have not become radioactive. Although this draft permit includes new waste streams from the Waste Treatment and Immobilization Plant, the flows permitted to discharge to the 200 Area TEDF are not radioactive.

Thank you for your question, and please let me know if I can be of further assistance.

Stacy Nichols
Water Quality Permit Coordinator
Nuclear Waste Program
509-372-7917
Snic461@ecy.wa.gov

From: Lumpkins, Pamela [<mailto:Pamela.Lumpkins@morganstanleysmithbarney.com>]
Sent: Monday, November 14, 2011 9:03 AM
To: Nichols, Stacy (ECY)
Subject: Hanford

Stacy,

Can you tell me if any of the liquids from the Hanford's 200 Area TEDF became radioactive?

Thanks,

Pamela Lumpkins
Sr. Registered Associate
Morgan Stanley Smith Barney
1001 SW 5th Ave., Ste 2200
Portland, OR. 97204
Phone: 503-221-8679
800-767-7824
Fax: 503-221-8602
pamela.lumpkins@mssb.com

Nichols, Stacy (ECY)

From: Nichols, Stacy (ECY)
Sent: Friday, December 09, 2011 1:14 PM
To: 'Jeanne Raymond'
Cc: Bond, Rick (ECY); Bohrmann, Dieter (ECY); Holmes, Erika (ECY); Brown, Madeleine (ECY)
Subject: RE: wastewater treatment plant

Ms. Raymond,

Thank you for your comment.

The permit ensures the water being discharged protects groundwater by meeting drinking water standards. The water being discharged is not contaminated. The kinds of waste water that enter the facility are those associated with ventilation, heating, and cooling systems for the buildings; steam condensate from heating potable (drinkable) water; condensate of pressurized potable water; rainwater; and untreated Columbia River water.

Stacy Nichols
Nuclear Waste Program
Washington Department of Ecology

-----Original Message-----

From: Jeanne Raymond [<mailto:raymondj@peak.org>]
Sent: Tuesday, November 29, 2011 5:05 PM
To: Nichols, Stacy (ECY)
Subject: wastewater treatment plant

Washington Dept. of Ecology,

I hope you are not seriously considering releasing waste water from a treatment plant, which has a risk of being contaminated, into holding ponds that could access the Columbia River. The risk seems too great. If this is the case, I would certainly recommend against renewing the permit.

Jeanne Raymond
Corvallis, OR 97330

Nichols, Stacy (ECY)

From: Nichols, Stacy (ECY)
Sent: Wednesday, December 14, 2011 4:54 PM
To: 'Mason Taylor'
Cc: Bond, Rick (ECY); Brown, Madeleine (ECY); Holmes, Erika (ECY); Bohrmann, Dieter (ECY)
Subject: RE: Is any of the water to be treated radioactive?

None of the water entering the Treated Effluent Disposal Facility is radioactive, nor has it ever been used in a nuclear reactor. It has not been in contact with any radioactive waste. The waste liquid comes from the following:

- * ventilation, heating, and cooling systems for the buildings
- * steam condensate from heating potable (drinkable) water
- * condensate of pressurized softened or deionized potable water
- * rainwater from parking lots and exterior paved areas
- * potable (treated) water
- * untreated Columbia River water
- * boiler blowdown
- * floor drains with limited and strictly controlled usage

Please let me know if you have any additional questions.

Stacy Nichols
Nuclear Waste Program
Washington Department of Ecology

-----Original Message-----

From: Mason Taylor [mailto:mnx24@soon.com]
Sent: Wednesday, December 14, 2011 12:28 PM
To: Nichols, Stacy (ECY)
Subject: Is any of the water to be treated radioactive?

Is any of the water to be treated radioactive? Has it been used to cool nuclear reactor? Is it part of the "cooling system" designed to prevent meltdown? Has it been used to cool down radioactive waste? If the water is radioactive, how does the treatment remove the radioactive material from the water? Thank you.

Mason Taylor healthcare not warfare

USDOE Comments

The following comments on the October 2011 Fact Sheet and draft State Waste Discharge Permit Number ST0004502 are from a coordinated review by the United States Department of Energy (DOE), Richland Operations Office (RL), the DOE Office of River Protection (ORP), and affected Hanford Site contractors.

Fact Sheet Comments

1. Summary, first paragraph (p. 1) states “water in close proximity to the ponds is found as groundwater at a depth of about 100 to 120 feet below the surface.” This should state “about 140 feet.”
2. Summary, first paragraph last sentence (p. 2) states that groundwater estimated travel time to the Columbia River is approximately 10 to 300 years. This appears to be a mistake in that III.B, top of page 19 states travel times are “approaching 120 to 300 years.” Please correct or clarify.
3. Section III A., Table 2. 222-S Laboratory complex no longer discharges steam condensate. Replace steam condensate with rainwater for consistency with the permit.
4. Section III A., Wastewater Treatment Processes, second bullet, 222 S Laboratory Effluent. Delete steam condensate from this paragraph as steam is no longer utilized at the 222-S laboratory.
5. Section III B., Description of the Groundwater, 2nd paragraph should read “The thickness of the formation varies from 90 to 100 feet.”
6. Section III B., Description of the Groundwater, 3rd paragraph needs thicknesses corrected as follows: “The lower part of the Ringold Formation, below this Lower Mud Sequence, consists of an 80 to 120 (approximate) foot thick zone of silty sandy gravel named Unit A.... The static water level in wells completed within the uppermost aquifer currently varies from 113 to 123 feet below the surface.”
7. Section III B., Description of the Groundwater, 5th paragraph needs correction: “Groundwater flows down-gradient toward the southwest at a flow rate of less than one foot per day in the uppermost aquifer beneath the TEDF. Hydrologic tests and recent head measurements indicate that the groundwater flow may be less than 0.01 feet per day. Groundwater currently flows toward the west from the 216-B-3 Pond complex (located west-northwest of 200 Area TEDF) with a hydraulic gradient of about 0.0014 foot per foot. Water levels in the area are currently declining at a rate of about 0.2 feet per year.”
8. Section III B., Description of the Groundwater, 8th paragraph should read: “The May Junction Fault is located approximately one mile east from 200 Area TEDF. It trends north-south with the east side displaced vertically downward about 185 feet. It is possible that the fault may hydraulically connect the confined aquifer in the Unit A gravel of the Ringold formation with water perched in the Hanford formation at the top of the Lower Mud Sequence, but it is also possible that mud has smeared along the fault zone sealing the fault and blocking this pathway. Recent research makes it appear likely that the May Junction Fault is an impediment to eastward movement of groundwater in the Ringold (confined) aquifer.”
9. Section III D., Table 5. Table 5 indicates the O&M Manual Review Letter is to be submitted annually. The table shows 8/10/10 was the last submittal date. Please change the last submittal date to 8/10/11.
10. Section IV. C Table 8. An enforcement limit of 0.3 mg/l total iron is proposed [see also draft permit ST 4502, Section S1.A.(Table)]. This limit is a drinking water limit based criterion from WAC 173-200-040, Table 1. In the past RL has occasionally had problems meeting this standard at 200 Area TEDF. RL believes this limit is too restrictive, and not justified by regulation. Continuing to maintain an iron enforcement level at 0.3 mg/l is not necessary for protection of human health or the environment, and is unreasonably burdensome in that it forces RL to meet a standard that historically has occasionally been

difficult to obtain. RL proposes that iron be dropped as an enforcement limit, and to monitor only for trending and tracking purposes.

Draft Permit Comments

11. The summary Table on page 2 lists steam condensate for 222-S Laboratory. Please delete steam condensate. Basis: Steam is no longer utilized at the 222-S Laboratory
 12. The Summary of Permit Report Submittals (page 5) states permit violation reports are to be submitted “Within 5 days upon discovery of a noncompliance, or such other time as may be agreed to by Ecology.” This appears to be in contradiction to S3.E.2.d, which allows for noncompliance outside the scope of S3.E.a. noncompliance to be reported with the submittal of monitoring reports required by S3.A. The table should be corrected to show that for some noncompliance situations, submittal of the report with monitoring reports is acceptable.
 13. S1.A., Effluent limits. The iron limits in the table should be removed as requested in Fact Sheet comment 10.
 14. S1.A., Table, Note b. The second sentence needs clarification: “For other units of measurement, the daily discharge is the average measurement of the pollutant over the day”
 15. S2.A Table and S2.C table: The QLs listed for oil and grease, arsenic, cadmium, chromium, lead, sulfate and total dissolved solids are lower than the WSCF laboratory QLs. The WSCF MDL does meet the QL. RL recommends changing the QLs to match the laboratory MDLs or provide a statement that the MDL is an acceptable substitute.
 16. S2.A Table and S2.C Table reference the laboratory method for iron as SW-846-8260. This method is for volatile organics. The method should be corrected to SW-846-6010 which is for metals by ICP-AES.
 17. S.2.E.1, E.3, E.6 and E.7. define continuous monitoring devices as flow, pH and conductivity. Section S.2.E.3 says “calibrate continuous pH and conductivity monitoring instruments weekly”, Section S.2.E.6 says “calibrate these devices at the frequency recommended by the manufacturer”, and Section S.2.E.7 says “calibrate flow monitoring devices at a minimum frequency of at least one calibration per year”. RL believes the intent is to calibrate pH and conductivity instruments weekly and flow instruments annually. Please clarify.
 18. S.2.E.4 says perform calibration of the pH meter by pulling a process sample and measuring the pH of the process sample using a second pH probe which has been calibrated using standard buffers. The current TEDF maintenance procedure is to temporarily remove the pH meter and place it in the standard buffers. This provides a better calibration (two-point rather than one-point) and doesn’t require a second pH probe. Please revise or clarify that the current calibration method is acceptable.
 19. S3.E 2.a(7) The twenty four hour reporting requirement for monitoring wells is no longer required and should be deleted.
- S.9 The requirement to submit variability study plans within 60 days of permit issuance does not match the WTP discharge schedule. The current baseline schedule for discharge is March of 2013 and Ecology will be updated if the schedule changes. It is recommended that this requirement be changed to submit variability study plans 60 days prior to the planned discharge date for WTP.