

ENGINEERING CHANGE NOTICE

1. ECN 643497

Page 1 of 2

Proj.
ECN

2. ECN Category (mark one) <input type="checkbox"/> Supplemental <input checked="" type="checkbox"/> Direct Revision <input type="checkbox"/> Change ECN <input type="checkbox"/> Temporary <input type="checkbox"/> Standby <input type="checkbox"/> Supersedeure <input type="checkbox"/> cancel/Void	3. Originator's Name, Organization, MSIN, and Telephone No. LD Berneski, 32330, L6-40, 373-1112	4. USQ Required? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	5. Date 11/20/98	
	6. Project Title/No./Work Order No. TEDF Monitoring Plan/CACN 101724 CA40	7. Bldg./Sys./Fac. No. 310	8. Approval Designator EQ	
	9. Document Numbers Changed by this ECN (includes sheet no. and rev.) HNF-SD-L045H-PLN-004, Rev. 2	10. Related ECN No(s). None	11. Related PO No. N/A	

12a. Modification Work <input type="checkbox"/> Yes (fill out Blk. 12b) <input checked="" type="checkbox"/> No (NA Blks. 12b, 12c, 12d)	12b. Work Package No. N/A	12c. Modification Work Complete N/A Design Authority/Cog. Engineer Signature & Date	12d. Restored to Original Condition (Temp. or Standby ECN only) N/A Design Authority/Cog. Engineer Signature & Date
---	------------------------------	--	--

13a. Description of Change Complete revision.	13b. Design Baseline Document? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
--	--

14a. Justification (mark one)			
Criteria Change <input checked="" type="checkbox"/>	Design Improvement <input type="checkbox"/>	Environmental <input type="checkbox"/>	Facility Deactivation <input type="checkbox"/>
As-Found <input type="checkbox"/>	Facilitate Const <input type="checkbox"/>	Const. Error/Omission <input type="checkbox"/>	Design Error/Omission <input type="checkbox"/>

14b. Justification Details
 Complete revision to meet current needs.

15. Distribution (include name, MSIN, and no. of copies)		RELEASE STAMP NOV 20 1998 DATE: _____ STA: _____ HANFORD RELEASE ID: _____
SN Bakhtiar	S3-28	
LD Berneski	L6-40	
DL Halgren	L6-04	
MF Marcus	T6-03	
KN Pool	T6-03	
DR Schell	L6-05	
SM Steele	T6-03	
		Central Files B1-07 DOE RL Reading Rm. H2-53

300 Area TEDF Permit Compliance Monitoring Plan

LD Berneski
WMH, Richland, WA 99352
U.S. Department of Energy Contract DE-AC06-96RL13200

EDT/ECN: 643497 UC: 602
Org Code: 32900 Charge Code: 101724 CA40
B&R Code: EW3130020 Total Pages: 16

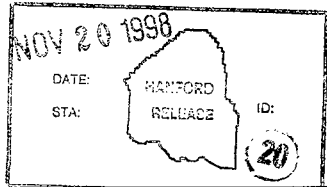
Key Words: analysis, compliance, effluent, wastewater, treatment, monitoring plan, TEDF, 300 Area, NPDES, DNR, sampling, landlease.

Abstract: This document presents the permit compliance monitoring plan for the 300 Area Treated Effluent Disposal Facility (TEDF). It addresses the compliance with the National Pollutant Discharge Elimination System (NPDES) permit and Department of Natural Resources Aquatic Lands Sewer Outfall Lease.

TRADEMARK DISCLAIMER. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise, does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof or its contractors or subcontractors.

Printed in the United States of America. To obtain copies of this document, contact: Document Control Services, P.O. Box 950, Mailstop H6-08, Richland WA 99352, Phone (509) 372-2420; Fax (509) 376-4989.

Janis Aardal 11-20-98
Release Approval Date



Approved for Public Release

1.0	Introduction	2
2.0	Program Organization and Responsibilities	2
	2.1 Laboratory Client Services (LCS)	2
	2.2 300 LEF Operations Support Engineering	3
	2.3 Sampling and Mobile Labs (SML)	3
	2.4 LEF Operations	3
	2.5 Pacific Northwest National Laboratory (PNNL) Environmental Characterization	3
	2.6 Analytical Laboratories	4
3.0	Sampling Location and Sample Frequency	4
	3.1 NPDES samples	4
	3.1.1 pH/Temperature/Flow	4
	3.1.2 Grab Samples	4
	3.1.3 WET samples	5
	3.2 DNR samples	5
	3.3 Receiving Water Quality (River) Samples	5
4.0	Sampling Equipment, Procedures, and Methods	7
	4.1 Required Methods	7
	4.2 Sampling Procedures	7
	4.3 Sampling Equipment	7
	4.4 Containers and Preservation	7
	4.5 Sample Collection	7
	4.6 Sample Identification	8
	4.7 Sample Labeling	8
	4.8 Sample Transport	8
	4.9 Security	8
	4.10 Health and Safety	8
	4.11 Equipment Decontamination	9
	4.12 Revisions to this Monitoring Plan	9
5.0	Quality Assurance	12
	5.1 Analytical laboratories	12
	5.2 Field Activities	12
	5.2.1 Field Sampling Log	12
	5.2.2 Field Quality Control Sampling	12
	5.2.3 Chain-of-Custody (COC)	13
	5.3 Data	13
	5.4 Reporting	14
	5.5 Retention of Records	14

1.0 Introduction

This Monitoring Plan (MP) describes the effluent discharge sampling for the 300 Area Treated Effluent Disposal Facility (TEDF). The TEDF was constructed as project L-045H to meet one of the milestones of the *Hanford Federal Facility Agreement and Consent Order* (Commonly referred to as the Tri-Party Agreement (TPA) (Ecology, 1989)). TEDF consists of a series of treatment processes to reduce suspended solids, dissolved metals, and organics to NPDES permit levels for discharge into the Columbia River.

The objective of this MP is to produce reproducible and reliable data which demonstrates compliance with NPDES permit No. WA-002591-7 and the Department of Natural Resources Aquatic Lands Sewer Outfall Lease No. 20-013356 (referred to as the DNR permit). Included in this document are specifics of the sampling effort, including the physical location and frequency of sampling, the support required for sampling, and the Quality Assurance (QA) protocols to be followed in the sampling procedures.

Sampling will consist of both composite samples and grab samples taken from the effluent line subject to permit constraints. Proper sample collection, sample identification, and field documentation procedures, including chain of custody, will maintain control over the samples. NPDES samples will be taken on a biweekly basis as required by the permit. Quarterly Whole Effluent Toxicity (WET) testing will also be performed for NPDES compliance. Monthly composite samples are taken in accordance with the DNR permit. Annual river samples are required by both the DNR and NPDES permits. Sample analyses will be performed by offsite contract laboratories and the Waste Sampling and Characterization Facility (WSCF).

Quality Assurance (QA) protocols will be followed to maintain data integrity. These procedures include specific requirements for both field and laboratory documentation, Quality Control samples, and proper chain of custody.

2.0 Program Organization and Responsibilities

2.1 Laboratory Client Services (LCS)

The LCS will act as the liaison between 300 Area Liquid Effluent Facilities (300 LEF) and the laboratories. LCS writes and maintains the Statement of Works (SOWs) for offsite laboratories providing services to Hanford contractors. LCS will provide the following services to 300 LEF: initiate Sampling Authorization Forms (SAFs), which describes the volume and necessary bottle type required by each laboratory; receive data from the laboratories; review the data for completeness; perform technical and administrative verifications on data packages; forward the data to 300 Area LEF, and transmit the data for long term storage at the records holding area.

2.2 300 LEF Operations Support Engineering

300 LEF Operations Support Engineering will be responsible for the interface with LCS. In order to fulfill this responsibility, an engineer will be assigned as Sampling Coordinator. The Sampling Coordinator shall specify in writing to the sample collectors the sample schedule including information on the analyses required, the volume and necessary bottle type for each sample. The Sampling Coordinator shall also be responsible for the oversight of the sampling effort including: data review, coordinating annual river sampling, periodic review of the sampling procedure and performance, ensuring that the requirements of the NPDES and DNR permits are being met, evaluating the need for additional sampling, and incorporating results into the proper reporting format for transmittal to FDH and DOE-RL and eventually to the outside agencies.

2.3 Sampling and Mobile Labs (SML)

Sampling and Mobile Labs provides clean preserved and unpreserved sample bottles. Containers are traceable to the lot number and corresponding certificate of analysis for that lot. All preservatives used are traceable to a lot number.

2.4 LEF Operations

The LEF Operations staff (Operations) shall be responsible for: obtaining sample bottles from SML; performing sampling, sample preparation and sample shipment in accordance with procedure 310-OP-024; making entries into the sampling log; initiating the chain of custody forms and retain custody of the samples until they are transferred to the laboratory for analysis.

These individuals will be trained to routine sampling and chain of custody tasks per Effluent Sampling Procedure 310-OP-024. Training will take place during on-the-job-training. Each operator will have completed the knowledge and performance requirements for sampling of the 300 Area TEF Nuclear/Chemical Operator Training Qualification Cards prior to performing any sampling activities.

2.5 Pacific Northwest National Laboratory (PNNL) Environmental Characterization

River samples are taken by PNNL Environmental Characterization. This group has the necessary equipment to perform the sampling and does most of the river sampling for the Hanford Site.

2.6 Analytical Laboratories

Analysis of the samples will be performed by an offsite contract laboratory and/or the WSCF. The laboratories perform analyses per the requirements in the SOW and/or SAFs administered by LCS. The laboratories will assist 300 LEF and LCS in resolving data anomalies.

3.0 Sampling Location and Sample Frequency

3.1 NPDES samples

The TEDF discharge will be sampled from sample ports on the effluent line after it leaves the effluent tank in the Northeast corner of the TEDF building. The NPDES permit states sampling will take place "In the effluent flow from the EF-T-10 Effluent Tank at the point of Effluent Tank overflow to the river outfall prior to discharge into the Columbia River." Grab samples are the required method of obtaining the samples for analysis. Temperature, pH, and flow will be continuously monitored.

3.1.1 pH/Temperature/Flow

Effluent pH, temperature and flow rate will be monitored on a continuous basis using an in-line temperature probe, pH probe and a flow meter. The data is collected on the historical data logger of the TEDF computer system. The River Discharge Data screen will be used to tabulate the high, low, and average pH, the high and average temperature, and the high and average flow rate each calendar month. The screen will not record data during effluent diversion or pH data during pH probe calibration.

3.1.2 Grab Samples

Grab samples will be taken manually from a valved port on the effluent line. The valve designated for sampling is valve TW-V-582. Total suspended solids (TSS) samples are required to be taken two times per week. The samples may be pulled any day of the week not to exceed the frequency of once every twenty-four hours. TSS samples will not be taken during periods of extended outage, when the wastewater is being diverted for treatment at a later date. The remaining analytes (see Table 3-1) are required on a biweekly basis (every other week). Generally this will occur on the first and third week of each month. The schedule of any particular month may change due to plant operation as directed by Sampling Coordinator.

3.1.3 WET samples

WET testing will be performed on a quarterly basis. WET testing shall consist of the 7-day fathead minnow, *Pimephales promelas*, test, the 7-day *Ceriodaphnia dubia* test, and the 4-day *Selenastrum capricornutum* growth test. These three tests will be conducted four times per year, during the months of February, May, August, and November. The sampling for each quarterly test activity will be completed in the span of one week, typically the first week on the month. This sampling consists of three, 24-hour composite samples. Normally, these composites are taken and shipped to the offsite laboratory on Monday, Wednesday, and Friday. The composite sampler is located downstream of the Effluent tank, prior to discharge to the river. The composite sampler used to collect WET samples is designated TW-M-8.

3.2 DNR samples

The DNR permit states "...monthly composite effluent samples taken from the EF-T-10 effluent tank, or equivalent..." Required analyses are total alpha, total beta, tritium, and gamma energy analysis. These monthly composite samples are taken the last week of the month. The DNR samples are taken from a composite sampler located downstream of the Effluent tank, prior to discharge to the river as required by the permit. The composite sampler used to collect DNR samples is designated TW-M-9.

3.3 Receiving Water Quality (River) Samples

River Monitoring is required once per year. The DNR permit states "This testing shall occur on an annual basis and may coincide with the annual NPDES sampling. Samples shall be taken from the river both upstream of the outfall and downstream at the edge of the mixing zone." The NPDES permit states sampling, "... shall be conducted at low river flow (generally during the month of September of each year), and the sampling day each year shall be selected to coincide with a day that effluent sampling is being conducted at the discharge." Since it is rarely predictable when low river flow will occur during any given year, sampling will be scheduled for the month of September, usually coinciding with the first bi-weekly sampling event of the month. A minimum of two sample stations will be established in the river along the approximate centerline of the discharge plume. One station shall be immediately upstream of the TEDF discharge diffuser. The other station is to be located 71 feet downstream of the diffuser. Samples are to be collected immediately below the surface.

Samples will be analyzed for all of the analytes in Table 3-1 as well as; total hardness, total alpha, total beta, gamma spectroscopy, radium-226, radium-228, strontium-90, and tritium (H-3). Cadmium, copper, lead, nickel, silver, and zinc will be analyzed for "dissolved", and "total recoverable." In addition, the river flow shall be measured or estimated at the time of sampling. Data from these tests are to be submitted the month after sampling with the monthly reports.

Table 3-1 NPDES Sample Schedule

Analyte	Schedule
Bis(2-ethylhexyl)phthalate	biweekly
Dichlorobromomethane	biweekly
Chlorodifluoromethane ¹	biweekly
Methylene Chloride	biweekly
Toluene	biweekly
1,1,1,-Trichloroethane	biweekly
Trichloroethylene	biweekly
Chloroform	biweekly
1,1-Dichloroethane	biweekly
Tetrachloroethylene	biweekly
Aluminum (Al)	biweekly
Arsenic (As)	biweekly
Beryllium (Be)	biweekly
Cadmium (Cd)	biweekly
Copper (Cu)	biweekly
Cyanide(Cn)	biweekly
Iron (Fe)	biweekly
Lead (Pb)	biweekly
Manganese (Mn)	biweekly
Mercury (Hg)	biweekly
Nickel (Ni)	biweekly
Nitrite (NO3)	biweekly
Selenium (Se)	biweekly
Silver (Ag)	biweekly
Zinc (Zn)	biweekly
Radium (pci/L)	biweekly
TSS	2 per week
Coliform	biweekly
Ammonia (as N)	biweekly

¹Analyte will be observed as a tentatively identified compound (TIC).

4.0 Sampling Equipment, Procedures, and Methods

4.1 Required Methods

The TEDF discharge will be sampled for a variety of analytes. These include organics, inorganics, and radionuclides. The NPDES permit approved methods used by the facility are provided in Table 4-1. Although the DNR permit does not have requirements for specify methods, Table 4-2 lists the methods used by the facility. Methods for NPDES and DNR analyses are provided to the laboratory via a SAF.

4.2 Sampling Procedures

Sample preparation, sampling, and sample shipment will be performed in accordance with operating procedure 310-OP-024. River sampling is performed in accordance with an approved SOW.

4.3 Sampling Equipment

Sampling equipment will consist of pre-prepared sample bottles. Grab samples will be taken directly in the sample bottles, thus limiting possible sources of sample contamination from intermediate equipment. Composite samplers are emptied after each sampling campaign: Composite sampler collection bottles are changed as deemed necessary by the sampling coordinator.

4.4 Containers and Preservation

Sample container, volume, preservation, and holding times for each analyte are listed in the associated SAF. Each month the samplers are provided new SAFs with the sample schedule.

All compliance sampling will be performed using certified pre-cleaned bottles and reagent grade chemical preservatives. Sample containers will be provided by SML. Sample containers will be prepared with preservatives by SML or by trained 300 LEF personnel. All sample containers to be used for compliance sampling will be secured in a locked cabinet until used.

Every effort is made to meet the sample preservation cooling requirements specified in the SAF. Per procedure samples are put on ice or refrigerated immediately following the sampling. Samples are usually received at the laboratory within a few hours of being taken. Due to high effluent temperatures (up to 35° C) and the short time between collection and receipt at the laboratory, samples may not achieve the 4° C temperature preservation protocol.

4.5 Sample Collection

Samples will be taken from the location described in Section 3.0. After samples are collected and labelled, they will either be placed in the locked laboratory refrigerator for temporary storage or placed in an ice chest and locked in the TEDF sample prep room or immediately delivered. All sample handling will conform to the requirements of 310-OP-024.

4.6 Sample Identification

Samples are to be identified by sequential identification numbers as provided by the Sampling Coordinator. The general format of the identification numbers will consist of the TEDF acronym, the date, and a sequential number (i.e. TEDF-MMDDYY-X). It should be noted that an entire sample suite for each laboratory will be regarded as one sample when analyzed and will therefore fall under one number.

4.7 Sample Labeling

Sample container labels will include the following information:

- Sample Identification Number (ie. TEDF-MMDDYY-xxx)
- Date
- Time (24 hour basis)
- Sample Location
- Sample Preservation
- Scheduled Analysis (ie. EPA Method xxx.x)
- Sampler's Initials

The adhesive labels will be marked with an indelible marker and fixed to the sample container. Tamper tape will be applied to the bottle cap to ensure sample integrity.

4.8 Sample Transport

With the exception of the WET samples, samples shall be transported by LEF personnel to the laboratory. The quarterly WET test samples will be transported to the offsite laboratory by a commercial carrier.

4.9 Security

The TEDF is a restricted access facility. Proper identification must be displayed at all times. The facility will be open to authorized personnel, but monitored by Operations, during normal business hours. The facility is locked during off hours. Only authorized entries are allowed. Visitors to the area must receive authorization from Operations prior to entry.

4.10 Health and Safety

The practices of the Occupational Safety and Health Administration (OSHA) will be followed in all sampling activities to ensure the safety of all those involved. Protective clothing is specified in procedure 310-OP-024 when taking samples. Additional protective measures are defined when adding preservatives to samples bottles.

4.11 Equipment Decontamination

Generally, equipment decontamination will not be required. Items such as composite sampler collection container and sample line tubing will be replaced as directed by the Sampling Coordinator. Should unique conditions arise where decontamination would be valuable, it will be performed in accordance with the Sampling Coordinator's written instructions.

4.12 Revisions to this Monitoring Plan

Revisions to this MP will be made by the Sampling Coordinator. Changes in analytical methodology, analytes of interest, or sampling frequency will be forwarded to outside agencies for approval prior to implementation.

Table 4-1 Permit Mandated Methods

Analyte	EPA Method
Bis(2-ethylhexyl)phthalate	625
Dichlorobromomethane	624
Methylene Chloride	624
Toluene	624
1,1,1,-Trichloroethane	624
Trichloroethylene	624
Chloroform	624
1,1-Dichloroethane	624
Tetrachloroethylene	624
Aluminum (Al)	200.8
Arsenic (As)	200.8
Beryllium (Be)	200.8
Cadmium (Cd)	200.8
Copper (Cu)	220.2, 200.8
Cyanide (Cn)	4500 CNE
Iron (Fe)	236.2
Lead (Pb)	200.8
Manganese (Mn)	200.8
Mercury (Hg)	245.2
Nickel (Ni)	200.8
Nitrite (NO3)	353.1, 353.2
Selenium (Se)	270.2, 200.8
Silver (Ag)	200.8
Zinc (Zn)	200.8
Radium (pci/L)	903.0
TSS	160.2
Coliform (#/100ml)	9222B
Ammonia (as N)	350.1, 350.3
Fathead Minnow Larval Survival and Growth	1000.0
Ceriodaphnia Survival and Reproduction	1002.0
Selenastrum Growth	1003.0

Table 4-2 DNR methods

Analyte	Method
total alpha	proportional count
total beta	proportional count
gamma emitters	gamma energy analysis
tritium	scintillation count

5.0 Quality Assurance

5.1 Analytical laboratories

Analytical laboratories perform analytical testing in accordance with applicable quality assurance requirements. Laboratories implement these requirements in their Quality Assurance Program Plans (QAPP) and standard operating procedures (SOPs). The laboratories are assessed by the appropriate quality assurance entity in accordance with HNF-PRO-268, "Control of Purchased Items and Services."

5.2 Field Activities

The Waste Management Federal Services of Hanford, Inc. (WMH), quality assurance (QA) program requirements are contained in HNF-SD-WM-QAPP-036, "Quality Assurance Program Plan". Sampling activities at the TEDF are governed by procedures which implement the requirements provided in QAPP-036.

5.2.1 Field Sampling Log

A Field Sample Log shall be completed by the sampler at the completion of the sampling event. The following information, shall be entered: sampler(s) name(s), sample ID number(s), date, time in 24 hour format, sample location, type of analysis, sample preservative (if any), and bottle lot number (s).

5.2.2 Field Quality Control Sampling

Quality control samples shall be taken at the specific direction of the Sample Coordinator. Due to the historically low incidence of anomalies and the relatively high costs involved in analysis, field quality control samples are primarily used as an investigative tool during the next sampling event, should irregularities be discovered after analysis.

5.2.3 Chain-of-Custody (COC)

Sample integrity shall be preserved during handling via WMH-200, Section 3.12, "Chain-of-Custody for Environmental Media and Waste". These requirements for generating, maintaining, relinquishing, and receiving samples under the COC protocols are identified in the sampling procedure, 310-OP-024.

A COC shall be generated and maintained for each compliance sample. The COC will serve as an unbroken record of responsibility for the samples in order to verify that the integrity of the samples has not been jeopardized. The samples shall remain in the possession of authorized personnel continuously until their destruction by analysis, test or disposal.

When a commercial carrier is transporting samples, as with the WET samples, the COC will be maintained during shipping/transportation of samples by either; 1) transportation by sequential custodians listed on a COC form, or 2) transportation by a bonded carrier after a custodian has sealed the shipping container with a tamper-indicating device, such as evidence tape. When using the second choice, the current custodian will sign off "relinquished by" section and then tape the COC inside the lid of the shipping cooler. As part of the preparation for transport by the commercial carrier, the cooler shall be sealed with tape and then tamper taped.

5.3 Data

Laboratory deliverables are provided to LCS which forwards the analytical data results to the Sampling Coordinator. The data is then reviewed to verify that; (1) the results have been received for all the parameters requested; (2) the data does not exceed the established permit values; and (3) the QC sample results provide evidence that the analytical results are defensible. Items reviewed include blank contamination level, matrix spike recovery information, minimum detectable levels, duplicate analysis values and methods used. Sample validation depends upon positive sample identification, conformance with sampling procedures, and a valid COC.

The source of all data anomalies shall be investigated by the Sampling Coordinator prior to preparation of the discharge monitoring report (DMR). Information regarding data anomalies, including QA/QC exceptions, which could affect the validity of analytical results, will be documented in the data files. Results from investigation of the cause and actions taken will be documented.

5.4 Reporting

The laboratories shall report the information listed below. The information is provided by hard copy report and/or access to the analytical database.

- Sample number
- Date analyses were performed
- Analytical technique or methods used
- Results of analyses
- Detection Level
- QC information (i.e., blank contamination, out of range matrix spike recoveries, missed hold time, method problems, etc)

All data values which are reported by the laboratory, above the minimum levels (ML's) listed in the NPDES Permit, Section I.D. Special Reporting Requirements, are reported in the DMR. Analytical results which are reported below the ML's are reported as 0.

5.5 Retention of Records

All sampling and analytical data and QA/QC data collected for the purpose of monitoring the TEDF in accordance with the NPDES permit, shall be retained for a period of at least three years from the date of initiation of the activity unless otherwise extended by the U.S. EPA, Region 10, Water Division Director. In addition, copies of the Discharge Monitoring Reports (DMR) and a copy of the NPDES permit must be maintained on-site during the duration of activity at the TEDF.