ENGINEERING CHANGE NOTICE

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Proj.
ECN

2. ECN Category (mark one) Supplemental ☐ Direct Revision ☒ Change ECN ☐ Temporary ☐ Standby ☐ Supersedeure ☐ Cancel/Void ☐	3. Originator's Name, Organization, MSIN, and Telephone No. 18700 L.L. Penn, FFTF Regulatory Compliance, N2-57 376-8991 6. Project Title/No./Work Order No. B12WT 400 Area Process Water (also known as the Secondary Cooling Water) 9. Document Numbers Changed by this ECN (includes sheet no. and rev.) WHC-SD-FF-PLN-002, Rev 4	4. USQ Required? ☐ Yes ☒ No 7. Bldg./Sys./Fac. No. 400 Area Process Sewer 10. Related ECN No(s). 186861, 167140, 197952, 604734	5. Date Sept. 18, 1996 8. Approval Designator E 11. Related PO No. N/A
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400 Area Secondary Cooling Water Sampling and Analysis Plan

Lucinda L. Penn

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Abstract: This is a total rewrite of the Sampling and Analysis Plan in response to, and to ensure compliance with, the State Waste Discharge Permit ST 4501 issued on July 31, 1996. This revision describes changes in facility status and implements requirements of the permit.

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400 Area Secondary Cooling Water Sampling and Analysis Plan			
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WHC-SD-FF-PLN-002
REV 5

400 AREA SECONDARY COOLING WATER
SAMPLING AND ANALYSIS PLAN

WHC-SD-FF-PLN-002
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A. INTRODUCTION AND DESCRIPTION OF SAMPLING OBJECTIVES

A.1 Introduction

The *Hanford Federal Facility Agreement and Consent Order* (Tri-Party Agreement) was signed by the Washington State Department of Ecology (Ecology), the U.S. Environmental Protection Agency (EPA), and the U.S. Department of Energy, Richland Operations Office, on May 15, 1989. Restrictions on the disposal of liquid effluents to the soil column at the Hanford Site are found in Tri-Party Agreement Milestone M-17-00 and corresponding interim milestones. Sampling and Analysis Plans (SAPs) are required for the 33 Phase I and Phase II streams that are discharged to the soil column. These SAPs are subject to the approval of EPA and Ecology.

A SAP was prepared for the 400 Area Secondary Cooling Water. The *400 Area Secondary Cooling Water Sampling and Analysis Plan*, WHC-SD-FF-PLN-002, establishes the requirements and guidelines used by Westinghouse Hanford Company (WHC) in implementing an upgraded liquid effluent sampling program. The 400 Area Secondary Cooling Water is more commonly known as the 400 Area Process Sewer, and the latter terminology will be used in this document. Both titles describe the same system and are interchangeable. Revision 1 of the 400 Area SAP was submitted on April 29, 1992, to fulfill Tri-Party Agreement Milestone M-17-44. This document, Revision 5 of the 400 Area SAP, implements the monitoring, quality assurance (QA), and record keeping requirements of the State Waste Discharge Permit ST 4501, issued July 31, 1996. Guidance from EPA and DOE on the establishment of Data Quality Objectives has also been incorporated into this document.

This SAP was prepared to include guidelines and requirements for special high quality liquid effluent sampling activities, which include the following: control of samples, laboratory analysis, processing of data, control of data, QA requirements, and corrective actions used in obtaining high quality data for the Liquid Effluent Sampling Program.

A.2 Objectives

This SAP provides information on how sampling and analysis of the 400 Area Process Sewer effluent and groundwater monitoring will be performed to accomplish the following objectives:

- Support the monitoring requirements of the State Waste Discharge Permit (SWDP) ST 4501.
- Routinely monitor the stream for flow-rate and constituents as identified in this document, to ensure that internal limits are met.
- Collect data to support implementation of the WAC-173-240 engineering report for the 400 Area Process Sewer.

- Provide data on chemical and radiological constituents to calculate loading and rate of migration to verify the assessment of impact of continued discharge.

QA objectives for the sampling activities are described in section H.

A.3 Approach

This SAP has been prepared to describe a program for obtaining high quality sampling data that will verify compliance with SWDP ST 4501 monitoring compliance for the 400 Area Process Sewer discharge. The data will come from liquid effluent samples that have quality controlled and verifiable methods for collecting the wastewater sample, transportation of the sample to the analytical laboratory, analysis of the sample, statistical evaluation of the analytical results, and the storage of sample records.

This SAP will identify the types of contaminants found in the liquid effluent stream from the 400 Area. The data will come from grab samples and composite samples that have quality controlled and verifiable methods for collection, transportation, analysis, statistical evaluation of analytical results, and storage of sample records.

All characterization sampling work shall be performed according to approved written procedures. The procedures shall comply with the requirements of *Test Methods for Evaluating Solid Waste*, EPA SW-846, Supplement 1990, and EPA 600/4-79-019.

All personnel associated with collection of samples, processing of the samples, processing of the data, and control of records shall comply with the procedures related to their responsibilities. The personnel shall sign a document verifying that they have read and understand the procedures.

The liquid effluent sampling utilizes both grab and time composite samples because some constituents are unstable with time. Grab samples are used to minimize the hold time from sample collection to laboratory analyses to prevent a significant loss of these unstable analytes.

B. SITE BACKGROUND

B.1 400 Area Facilities Description

The 400 Area contains four facilities which contribute to the 400 Area Process Sewer (see Figure 1). These four facilities are not cross-connected by underground piping. The effluent does not flow from one facility to another. The process water flows out from all four facilities through individual pipelines to a sewer main pipe (see Figure 1). This sewer main leaves the 400 Area and discharges the effluent to one of two Percolation Ponds, which will be described at the end of this section.

The four contributing facilities contain 50 active contributors (i.e., points of entry) to the 400 Area Process Sewer. Table 1 identifies all the entry points, locations, and flow rates. Of the 50 active points of entry, nine routine contributors represent greater than 99% of the total water volume currently discharged into the process sewer. The 50 active points of entry and, more specifically, the nine routine points of entry will be discussed further in Section B.3, "Stream Description." The facility descriptions and their associated points of entry are summarized below.

1. **Fuels and Materials Examination Facility (FMEF).** The FMEF is designed and constructed to be a high security, multi-storied structure with the capability to handle low and high exposure radioactive materials. The original intent was to use FMEF to fabricate and reprocess Fast Flux Test Facility (FFTF) fuel and experiments. Due to program and funding changes, most of the specialized equipment has never been installed and radioactive material has never been introduced to the facility. The facility is used only for personnel offices.

FMEF points of entry. The FMEF contains 41 points of entry to the process sewer. Four are routine and 37 are infrequent contributors. The facility is equipped with two liquid waste systems (36B and 36D), which provide effluent holding and sampling from areas of the facility where the potential for contamination would be the greatest. In Revision 0 of the Phase II Liquid Effluent Program Engineering Report (WHC-SD-W252-ER-001), the 36B system was identified as the Retention Liquid Waste System (RLWS). The 36D, or Radioactive Liquid Waste System, originally was intended to contain radioactive waste. However, with the change in mission for the FMEF, this system has not been used for its intended purpose. Waste water from the fire testing system and a lunchroom sink are the only discharges to the 36D system. The 36B system contains discharges from HVAC condensate, electric water cooler discharges, and routine discharges from testing the fire water systems. With this system, all aqueous waste generated in areas served by either the 36B system or the 36D system is collected in one of two 6,000 gallon tanks. Each system has two 6,000 gallon tanks for a total of four tanks. The effluent can be sampled for possible radioactivity and verified to meet acceptable discharge limits before being discharged into the process sewer. Due to this low volume, the tank contents are

expected to be discharged to the process sewer only one or two times a year, but may be increased to discharge as often as four times per year.

2. Maintenance and Storage Facility (MASF). The MASF consists of a main building and a two story service wing, located within the 400 Area Protected Area. The purpose of this facility is to provide maintenance, repair, and storage facilities for radioactive or specialized maintenance equipment used in support of FFTF.

MASF points of entry. The MASF contains four points of entry to the process sewer. One is routine and three are infrequent. The points of entry to the process sewer are not located in areas with the potential for radioactive contamination. All contaminated liquid waste is collected in radioactive liquid waste tanks and is not in contact with the process sewer effluent at any point. The radioactive liquid discharge collection system and the process water discharge are separate systems and are not connected. The routine contributor is the cooling water from the building service and instrument air compressor.

3. 481-A Water Pumphouse. The Water Pumphouse is a concrete block building, on a concrete pad, which was constructed to provide space for a diesel fire pump and two sanitary water pumps. This building is also located within the 400 Area Protected Area. As shown in Figure 1, this facility is detached from the FFTF reactor containment and service building. No radioactive material is in this building.

481-A Water Pumphouse points of entry. The pumphouse contains five points of entry: one is routine and four are infrequent contributors. These points of entry are all related to the pumps housed in the facility. The four infrequent contributors (floor drains) are protected from contaminants by detailed maintenance procedures in the form of Work Packages with administrative controls. The fourth floor drain, a frequent contributor because of weekly fire pump testing (a National Fire Protection Association [NFPA] requirement) is protected from potential contamination since its inlet is installed above floor level. A 300 gallon fuel tank for the diesel fire pump is installed above floor level on a seismically qualified support (also an NFPA requirement). There is a very minor risk of the introduction of diesel fuel or equipment oil into the process sewer due to maintenance or an emergency in this building.

4. The Fast Flux Test Facility (FFTF). The FFTF is a sodium cooled test reactor. The reactor's high neutron flux levels and energies have allowed accelerated testing of fuels and materials. The reactor is currently transitioning towards shutdown condition.

Eight cooling towers reject heat generated in equipment supporting the FFTF auxiliary systems, such as the heating, ventilation, and air conditioning (HVAC) systems. Adjacent to the cooling towers pad, a support building contains the water treatment equipment, water quality

monitoring instrumentation, and the process controls for blowdown valves associated with the towers. This system is adjacent to the facility's reactor containment and service buildings within the 400 Area Protected Area. There is no contact between the process sewer and the cooling tower system and any radioactive wastes or nuclear materials in the facility.

The amount of waste process water discharged is expected to remain at current levels during standby and during possible restart. Since the cooling tower treatment procedures have not changed with the change in plant status, the effluent constituents would also remain unchanged.

FFTF points of entry. The cooling towers have three possible points of entry. All three are considered routine contributors to the process sewer effluent. They are 1) the equipment drain in the water treatment building which receives the effluent wastewater discharged by the cooling tower blowdown system, 2) the drain trench on the north side of the cooling tower pad which handles overflow or draining of the towers and precipitation runoff, and 3) the sink in the water treatment building which the operators use to wash their gloves, glassware, small equipment, hands, and similar items. In the water treatment building, the only chemicals that could be discharged into the sink are those already used to treat the cooling towers (no other chemicals are in the building).

B.1.1 Intermittent Batch Sources

Three intermittent sources result in batch discharge to the Secondary Cooling Water System. These sources are the FMEF 36B system and 36D system, the Large Diameter Cleaning Vessel (LDCV) in MASF, and the mitigation pump bearing cooling water in the 481-A Pumphouse. The intermittent sources are:

1. FMEF 36B system and 36D system.
2. MASF Large Diameter Cleaning Vessel consisting of water used in the testing of mitigation pumps for Tank Waste Remediation Support.
3. Bearing Cooling Water at approximately 25 gpm (once through cooling) from mitigation pump test runs.

These sources are discharged through flowpaths identified in Table 1. FMEF Condensate is discharged through many of the FMEF floor drains in Table 1, the MASF LDCV is discharged through MASF floor drain #63, and the mitigation pump bearing cooling water is discharged through MASF floor drain #77.

B.2 4608 Percolation Ponds B and C Description

The 4608 Percolation Ponds B and C are engineered structures, located north-northeast of the 400 Area. The unlined ponds are 50x100 ft at the base, and are approximately 4 ft deep. The 400 Area Process Sewer empties into a diversion box built into the earthen wall dividing the two ponds. Manually

operated slide gates located on either side of the diversion box determine the flow to the B or C pond. The ability to isolate either pond is provided to allow for maintenance.

B.3 Stream Description

Table 1 identifies all the potential contributors (i.e., points of entry) to the 400 Area Process Sewer. Nine routine contributors represent greater than 99% of the total water volume currently discharged into the process sewer. The nine routine contributors are discussed below. They have been given item numbers in Table 2 for ease of reference.

Five of the routine contributors, which are items 1 through 5 on Table 1, are associated with the FMEF and FFTF cooling tower systems. The other four routine contributors, which are items 6 through 9 on Table 1, are associated with auxiliary facility equipment and cooling systems. The effluent stream has the basic characteristics of the 400 Area sanitary (potable) water supply. All of the 400 Area water is pumped from deep wells and chlorinated. The effluent waste stream divides into approximately 15% use from equipment and auxiliary systems cooling, and 85% from the two cooling tower systems.

The cooling tower systems at FMEF and FFTF have the same basic design and use the same treatment chemicals. Cooling towers at FFTF and FMEF represent the source of the majority of the water which is eventually discharged to the 400 Area Process Sewer, which may have been the reason for describing this discharge as "400 Area Secondary Cooling Water." The cooling tower operations at FMEF and FFTF differ in demand, but the basic design of the towers and the chemicals used at both facilities are the same. The cooling towers at both facilities are galvanized steel, closed loop evaporative cooling towers. The cooling systems for the facilities circulate a 40% ethylene glycol solution from the buildings through cooling coils in the cooling towers. Water is sprayed over coils as air is blown up through the cooling towers by fans. The evaporation of the spray water provides the cooling effect which is transferred through the cooling coils to the recirculated ethylene glycol solution. The three towers at FMEF and the eight towers at FFTF each have a sump capacity of approximately 2,000 gallons and periodically require draining for maintenance.

The chemical control systems have two objectives: to control biological growth within the tower and to protect the tower from the effects of scale formation.

The biological control is accomplished by use of two different chemicals, a biocide (Dearborn 702) and (at FFTF only) a microbicide (sodium hypochlorite). Biological growth within the cooling tower is controlled because detrimental biological species would thrive in a warm moist environment causing offensive odors or health risks to personnel. Fouling of the cooling tower tubes with algae would inhibit heat transfer from the recirculated loop to the spray water.

Biological growth control is accomplished by adding the biocide (702) to the sump water on a regular basis to maintain a 25 mg/l concentration in the towers. At FFTF the biocide (702) is continuously added by a metering pump into the makeup water provided to the towers. At FMEF, however, the biocide is added daily via metering pump into a recirculated stream of water from each cooling tower sump. At FFTF, the addition of sodium hypochlorite is done manually to "shock" the tower only when maintenance requires personnel to physically enter the towers for cleaning (normally done during the spring and summer months). The microbicide sodium hypochlorite will have a concentration of 5 mg/l for the shock treatment and 0.6-0.8 mg/l if the normal 702 metering pump system is inoperative.

Scale formation protection is required due to increasing concentration of naturally occurring salts (typically calcium carbonate) resulting from the evaporation of the tower water. Primary protection is accomplished in both FMEF and FFTF by monitoring the electrical conductivity of the water in the sump. When the water conductivity approaches 1200 micromhos, automatic valving opens to discharge water. This conductivity is 3.5-4 times the average concentration of the incoming water, which corresponds to 2.5-3 cycles (uses) of the water through the cooling towers. Therefore, the concentration of nonvolatile constituents is expected to be at least 2.5 times that of the well water. Due to the discharge of water, the tower sump water level control system will initiate the addition of makeup water. The discharge of water continues until the conductivity of the sump water has fallen to approximately 900 micromhos due to the addition of fresh water.

A scale inhibitor, Dearborn 878, is added to the towers to maintain concentrations of 50-75 mg/l in order to prevent the formation of scale. Scale inhibitor concentration control at FFTF is accomplished by metering the chemical into the makeup water to a concentration of approximately 40 mg/l. This concentration increases to the required range in the tower because of the evaporation of the water. At FMEF, the control is accomplished by metering the chemical directly into the tower when the conductivity control system opens the valve which blows down the sump water. As an independent operational check, a chemical analysis is performed in the field by the operator to ensure that the proper balance between addition to and discharges from the cooling towers is being maintained.

The chemical testing for scale inhibitor concentration involves the use of the following Dearborn Products:

- Dearborn Code 595 Hydrochloric Acid Solution
- Dearborn Code 904 Thorium Nitrate Solution
- Dearborn Code 550 Sodium Thiosulfate/Borate Solution
- Dearborn Code 562 Xylenol Orange Indicator
- Dearborn Code 899 Beryllium Sulfate Solution
- Dearborn Code 575 Glacial Acetic Acid

The resultant solution from the test (approximately 50 ml per test) is not designated a dangerous waste since the beryllium concentration is .00095%, which is <.01% of the reportable concentration level. The resultant solution at 0.0068 kg/year of glacial acetic acid added into the system is not designated as dangerous waste because the equivalent concentration is less than 0.01%. In conjunction with the washing of gloves, glassware, equipment, hands, trace quantities of these products, along with the other cooling tower chemicals described above, are subject to disposal via the sinks located in both cooling tower buildings.

Past sampling, analysis and process knowledge have indicated that the constituents in this waste stream are at innocuous levels. The cooling tower systems are the major contributors to the effluent stream and, as shown in the above discussion of chemical treatment, present the major potential for dangerous constituents in the waste stream. The average discharge amount for the cooling tower systems is shown in Table 1. The end-of-pipe discharge is not substantially diluted by the other contributing effluent. The potential for effluent dilution will be closely monitored by sampling at the major contributing points of entry, as well as final discharge point. Historical information regarding the stream description and past sampling data can be found in "400 Area Secondary Cooling Water Stream-Specific Report" (WHC-EP-0342, Addendum 28).

The other potential points of entry are controlled by means of systems such as the FMEF RLWS. In all cases potential hazardous and dangerous materials are stored away from the points of entry and are controlled by administrative procedures. The majority of the points of entry are inactive.

Figure 1 provides a map of the 400 Area Process Sewer contributors, and the sewer main route to the 4608 Percolation Ponds. As discussed in the facility descriptions, the contributors to the process sewer are not cross-connected. The process water from each point of entry flows from its respective facility through an outgoing 6-inch pipe, which enters a 12-inch diameter pipe located in the approximate center of the 400 Area. This single outgoing pipe runs outside of the 400 Area Protected Area fence, and discharges to the one of the two Percolation Ponds. The effluent does not flow between facilities and becomes a single waste stream prior to discharge.

Figure 1. The 400 Area Process Sewer
Map of Contributing Facilities
and Effluent Discharge Route

Table 1. List of Contributors to 400 Area Process Sewer.

Item	Entry type	Location	Fig. ref.	Room	Status	Type Routine (R) Infrequent (I)	System 36B ¹	Source	Flow range (gal/min)	Estimated avg. flow (gal/min)
1	EW	FMEF-PB	2-9	600	Active	I	X	Personnel	-[4]	-
2	EW	FMEF-PB	2-9	608	Active	I	X	Personnel	-	-
3	EW	FMEF-PB	2-10	515	Active	I	X	Personnel	-	-
4	EW	FMEF-PB	2-11	409	Active	I	X	Personnel	-	-
5	EW	FMEF-PB	2-11	430	Active	I	X	Personnel	-	-
6	EW	FMEF-PB	2-14	117	Active	I	X	Personnel	-	-
7	EW	FMEF-PB	2-13	223	Active	I	X	Personnel	-	-
8	EW	FMEF-FAA	2-6	E105	Active	I	X	Personnel	-	-
9	JS	FMEF-PB	2-10	504	Active	I	X	Personnel	-	-
10	JS	FMEF-PB	2-11	408	Active	I	X	Personnel	-	-
11	JS	FMEF-PB	2-12	309	Active	I	X	Personnel	-	-
12	JS	FMEF-PB	2-14	149	Active	I	X	Personnel	-	-
13	JS	FMEF-FAA	2-7	E278	Active	I	X	Personnel	-	-
14	JS	FMEF-CT	2-2	N. Yard	Active	R		Personnel	<1	<1
15	FD	FMEF-PB	2-11	404	Deleted	I	X	Process water/condensate	-	-
16	FD	FMEF-PB	2-13	238	Deleted	I	X	Process water/condensate	-	-
17	FD	FMEF-PB	2-12	302	Active	I	X	Process water/condensate	-	-
18	FD	FMEF-PB	2-12	307	Deleted	I	X	Process water/condensate	-	-
19	FD	FMEF-PB	2-12	308	Active	I	X	Process water/condensate	-	-
20	FD	FMEF-PB	2-12	313	Active	I	X	Process water/condensate	-	-
21	FD	FMEF-PB	2-13	224	Deleted	I	X	Process water/condensate	-	-
22	FD	FMEF-PB	2-13	213	Active	I	X	Process water/condensate	-	-
23	FD	FMEF-PB	2-13	213	Active	I	X	Process water/condensate	-	-
24	FD	FMEF-PB	2-13	204	Deleted	I	X	Process water/condensate	-	-
25	FD	FMEF-PB	2-13	206	Deleted	I	X	Process water/condensate	-	-
26	FD	FMEF-PB	2-12	321	Active	I	X	Process water/condensate	-	-
27	FD	FMEF-PB	2-13	209	Active	I	X	Process water/condensate	-	-

Table 1. List of Contributors to 400 Area Process Sewer.

Item	Entry type	Location	Fig. ref.	Room	Status	Type Routine (R) Infrequent (I)	System 36B ¹	Source	Flow range (gal/min)	Estimated avg. flow (gal/min)
28	FD	FMEF-PB	2-12	300	Deleted	I		Process water/condensate	-	-
29	FD	FMEF-MEW	2-8	352	Deleted	I		Process water/condensate	-	-
30	FD	FMEF-MEW	2-8	352	Deleted	I		Process water/condensate	-	-
31	FD	FMEF-MEW	2-8	352	Deleted	I		Process water/condensate	-	-
32	FD	FMEF-MEW	2-8	352	Deleted	I		Process water/condensate	-	-
33	FD	FMEF-MEW	2-8	352	Deleted	I		Process water/condensate	-	-
34	FD	FMEF-MEW	2-8	352	Deleted	I		Process water/condensate	-	-
35	FD	FMEF-MEW	2-8	352	Deleted	I		Process water/condensate	-	-
36	FD	FMEF-MEW	2-8	352	Deleted	I		Process water/condensate	-	-
37	FD	FMEF-MEW	2-8	352	Deleted	I		Process water/condensate	-	-
38	FD	FMEF-MEW	2-8	352	Deleted	I		Process water/condensate	-	-
39	FD	FMEF-MEW	2-8	352	Deleted	I		Process water/condensate	-	-
40	FD	FMEF-MEW	2-8	352	Deleted	I		Process water/condensate	-	-
41	FD	FMEF-MEW	2-8	352	Deleted	I		Process water/condensate	-	-
42	FD	FMEF-MEW	2-8	352	Deleted	I		Process water/condensate	-	-
43	FD	FMEF-MEW	2-8	352	Active	I		Process water/condensate	-	-
44	FD	FMEF-MEW	2-8	352	Bermed	I		Process water/condensate	-	-
45	FD	FMEF-MEW	2-8	352	Bermed	I		Process water/condensate	-	-
46	FD	FMEF-MEW	2-8	352	Bermed	I		Process water/condensate	-	-
47	FD	FMEF-MEW	2-8	352	Bermed	I		Process water/condensate	-	-
48	FD	FMEF-MEW	2-8	352	Bermed	R		Process water press. regulator	<1	<1
49	FD	FMEF-EEW	2-12	355	Bermed	I			-	-
50	FD	FMEF-EEW	2-12	355	Bermed	I			-	-
51	FD	FMEF-FAA	2-6	E104	Bermed	I	X		-	-
52	FD	FMEF-FAA	2-6	E104	Active	I	X		-	-
53	FD	FMEF-FAA	2-6	E104	Active	I	X		-	-
54	FD	FMEF-FAA	2-6	E104	Active	I	X		-	-
55	FD	FMEF-FAA	2-6	E300	Active	I	X		-	-

Table 1. List of Contributors to 400 Area Process Sewer.

Item	Entry type	Location	Fig. ref.	Room	Status	Type Routine (R) Infrequent (I)	System 36B ¹	Source	Flow range (gal/min)	Estimated avg. flow (gal/min)
56	FD	FMEF-CT		N. Yard	Active	I		Empty CT chemical drum wash System 36D discharge point	-	-
57	ED	FMEF-PB	2-13	204	Active	I	X		-	-
58	ED	FMEF-PB	2-13	238	Active	I			-	-
59	ED	FMEF-EW	2-7	E215	Active	R		Air conditioning cooling water	0-3	<1
60	ED	FMEF-CT	2-4	N. Yard	Bermed	I			-	-
61	ED	FMEF-CT	2-4	N. Yard	Active	R		Cooling tower drain	0-10[2]	4[2]
62	FD	MASF-HB	2-15	High Bay	Deleted	I		Steam cleaner drain	-	-
63	FD	MASF-HB	2-15	High Bay	Bermed	I			-	-
64	ED	MASF-ER	2-15	Equip. rm.	Bermed	R		Air compressor cooling water	0-12	2[3]
65	ED	MASF-ER	2-15	Equip. rm.	Bermed	X			-	-
66	FD	PH-481-A	2-16		Plugged	X			-	-
67	ED	PH-481-A	2-16		Bermed	R		Sanitary water pump	<1	<1
68	ED	PH-481-A	2-16		Bermed	X			-	-
69	ED	PH-481-A	2-16		Bermed	X			-	-
70	JS	FFTF-CT	2-17	611	Bermed	R		Personnel	<1	<1
71	ED	FFTF-CT	2-17	611	Active	R		Cooling tower blowdown	4-25[2]	10
72	ED	FFTF-CT	2-17	Pad	Active	R		Overflow and rain	0-10	1
73	Sump	FMEF-PB		106	Active	X	X		-	-
74	Sump	FMEF-PB		105	Active	X	X		-	-

Notes: [1] Effluent waste water collected and stored in FMEF retention liquid waste tanks. Allows sampling (future) before discharge to process sewer.

[2] Variance results from ambient conditions (FMEF Cooling Tower 0 flow for November through March).

[3] Facility support system intermittent operation.

[4] Flow is infrequent and nonroutine. Flowrate is not available.

Legends:

FFTF-CT = FFTF cooling tower area on 483 Pad

FMEF-CT = FMEF cooling towers area

FMEF-EW = 427 Emergency Equip. Wing

FD = Floor drain

MASF-HB = High-bay area of 437 Bldg.

MASF-ER = Equip. room of 437 Bldg.

PH-481-A = 481-A Pumphouse

JS = Janitorial Sink

FMEF-EW = 4862 Entry Wing

FMEF-FAA = 4862 Fuel Assembly Area

FMEF-MEW = 427 Mech. Equip. Wing

FMEF-PB = 427 Process Bldg.

ED = Equip. drain

EWC = Electric water cooler

C. RESPONSIBILITIES

The responsibility descriptions below are related to wastewater sampling activities occurring at the 400 Area as described in this SAP. Overall responsibilities for other components of the sampling program are described in the QAPP.

FFTF Regulatory Compliance personnel will do the following:

- Submit monitoring data to Ecology in compliance with SWDP ST 4501.
- Coordinate the overall program.
- Maintain the *400 Area Secondary Cooling Water SAP*.
- Ensure that procedures are prepared to support the sampling activities.
- Initiate scheduling of personnel required for sampling.
- Provide technical support for sampling activities.
- Review data logs and sampling activities.
- Oversee Chain-of-Custody activities at the facility.
- Review sampling data for completeness and consistency, initiating corrective action if necessary.
- Submit copies of analytical results of drinking water to Washington State Department of Health and Ecology.
- Coordinate maintenance and surveillance of sampling and monitoring systems.

The Sampling and Mobile Laboratory organization will do the following:

- Provides sampling and transportation of routine monitoring program samples.
- Provides trained samplers for sampling activities.
- Provides at least one sampler with a Certificate of Qualification from the Sampling and Mobile Laboratories Group.
- Prepares and maintains the 400 Area wastewater sampling and packaging procedure.
- Ensures that the certified sampler directs sampling and packaging.
- Documents sampling activities in a log book.

- Transports samples to laboratory or shipping center.
- Initiates Chain-of-Custody documentation for samples.
- Packages samples for shipping.
- Ensures that copies of field logs and other sampling data sheets are filed with FFTF Regulatory Compliance cognizant engineer.

Analytical Services (AS) performs the following:

- Provides data validation services.
- Selects a laboratory for analysis of samples.
- Tracks, receives and inspects sample analytical records generated in support of this project.

The 400 Area QA organization does the following:

- Prepares and maintains the QA Program Plan.
- Provides surveillance of the sampling program.
- Audits records and procedures.
- Issues a stop work order if procedures are not being followed.

D. SAMPLING LOCATION AND FREQUENCY

D.1 Sampling Location

D.1.1 Effluent Sampling

Effluent sampling activities include composite effluent sampling and continuous pH, flowrate, and conductivity measurements at the North Environmental Monitoring Station, also known as the flow meter hut, Building 4608B (see Sampler Weir on Figure 1). A composite sample is drawn and analyzed once every 60 days (hereafter referred to as bi-monthly). Continuous (circle chart) pH, flowrate, and conductivity measurements are collected weekly. As discussed in the stream description (Section B.3), the sampling location provides a representation of the total contribution to the 400 Area Process Sewer. The analytes of interest for the bi-monthly composite sample are specified in Section G.2 of this document.

D.1.2 Groundwater Sampling

Groundwater samples will be taken from two points, 1) FFTF groundwater monitoring well 699-8-17 (upgradient) and 2) FFTF groundwater monitoring well

699-2-7 (downgradient). The groundwater sample analytes are shown in Section G.3.

A third well will be operational by July 1998. Sampling of the new well shall commence in the third quarter of 1998 and shall be consistent with the requirements for the other wells.

D.1.3 Batch Source Sampling

Samples of batch discharges from the FMEF 36B System and/or 36D System will be taken and analyzed for the constituents listed in Section G.4, Analytical Requirements, prior to discharge. The sample analysis will be completed and evaluated prior to discharge.

D.2 Frequency

Bi-monthly composite samples will be taken from the process sewer sampler, located in Building 4608B. The bi-monthly periods are defined as January-February, March-April, May-June, July-August, September-October, and November-December. Composite sampling will consist of collecting no less than 10 ml of effluent per four hour interval. This bi-monthly composite sample will comply with the written facility operating procedures. These procedures specify the appropriate procedure for operating the equipment, using a clean sample bottle, collecting representative effluent, and appropriate transportation to the laboratory. Grab samples will be taken from the effluent stream at the time the composite sample is collected.

Samples of batch discharges listed in section D.1.3 will be analyzed on an as needed basis prior to discharging either the 36B system or the 36D system to the 400 Area Secondary Cooling Water System. These discharges can occur once per quarter each.

Quarterly groundwater samples will be taken at the groundwater monitoring wells. The four quarters are defined as January through March, April through June, July through September, and October through December.

Additional sampling events may be conducted for additional verification of constituent analysis. These sampling events will be conducted by the same responsible personnel as described in Section C. Quality control samples such as field duplicates will be taken during each sampling event and will conform to the criteria listed in "Test Method for Evaluating Solid Wastes, SW-846."

Field duplicate samples will be taken during each sampling event. Duplicate samples shall be retrieved from the same sampling location at approximately the same time, and under identical conditions and preparation, to verify the repeatability of the laboratory data. Field duplicates shall be analyzed independently.

Monitoring for the flowrate, pH, and conductivity of the effluent is done on a continuous basis by installed instrumentation. With the exception of

flowrate, these conditions will also be monitored by the sampling team when those sampling activities are conducted. The sampling team is also trained to make the appropriate environmental observations in log books, and used the prescribed control samples to assure a quality data record of the sampling environment.

E. SAMPLE DESIGNATION

For bi-monthly composite samples, the sample is transferred by Mobile Sampling from the sampler receiving bottle into clean, labeled, one liter bottles. The date and time of sample collection, the stream identification, the sampling location, identification of the person in charge of collecting the sample, preservative added, and the analysis to be performed on the sample will be included on the label with the unique identification number.

Liquid effluent and groundwater samples will be assigned a HEIS number by AS.

Sample labels for liquid effluent and groundwater characterization samples will be provided by the sampling team from the Sampling And Mobile Laboratory. In addition, each bottle shall be identified with a bar code sticker attached to the bottle by the bottle manufacturer. The bar code shall identify the bottle lot number and individual bottle number.

F. SAMPLING EQUIPMENT AND PROCEDURES

F.1 Effluent Monitoring

The routine monitoring of discharges to the 4608 B and C Percolation Ponds is performed in the North Environmental Monitoring Station located north of the 400 Area. As discussed in the stream description above, this location is the representative point to obtain a typical sample of the total facility effluent stream. The characteristics for which the effluent is continuously monitored include pH, flowrate, and conductivity. Where applicable, preventative maintenance and calibration procedures are used to maintain the sampling and monitoring equipment.

The bi-monthly composite effluent samples will be analyzed for the analytes shown in Section G.2 in accordance with methods from either EPA SW-846, or EPA-600-4-79-019. A state accredited laboratory will perform the analysis using current approved procedures and QA requirements. The data sheets and analytical results from the laboratory will be transmitted to and maintained by FFTF Regulatory Compliance.

Data and record information that has been validated will be transmitted to the Administrative Record or to the HEIS data file when it becomes available.

F.2 Groundwater Monitoring

"Procedure for Collecting RCRA/CERCLA Samples From the 400 Area Secondary Cooling Water (Process Sewer) System" (WHC, LO-080-433A.0) is the facility-specific procedure for effluent characterization sample collection and analysis. The sampling procedure identifies 400 Area-specific sampling requirements, which include the following:

- Sampling location.
- A description of sampling equipment, containers, and reagents.
- Safety precautions, including personnel protective equipment.
- Specific steps for collecting the sample.
- Instructions for completing field notebook entries, sample labels, and sample Chain-of-Custody forms.

Field logs will be completed per the "Environmental Investigations and Site Characterizations Manual," WHC-CM-7-7, procedure EII 1.5 "Field Logbooks", during the sampling event. The logbook shall contain information pertinent to the sampling, including any intermittent sources at the time of sampling.

G. SAMPLE HANDLING AND ANALYSIS

G.1 Sample Analysis

The actual analyses for the required analytes are discussed in the WHC-SD-EN-SPP-002, "Data Validation Procedures for Chemical Analyses." All parameters specified will be analyzed to the PQL values listed in SWDP ST 4501 and according to the required analytical methods specified. Alternate methods may be used as long as PQLs can be met. Certain parameters will be monitored to provide an early warning that allowable limits for discharge to groundwater are being approached. Attainment or exceedance of an Early Warning Value will be reported to Ecology within ten days of detection.

G.2 Effluent Analysis

The requirements of this section apply to the bi-monthly composite and grab samples of the 400 Area Secondary Cooling Water System taken from the flow monitoring hut, Building 4608B and, described in Section D.1.1. The bi-monthly effluent samples will be analyzed for the following:

Constituent	CASN	Permit PQL ($\mu\text{g/l}$)	Analytical Method	Sample Type	Sampling Frequency
Arsenic	7440-38-2	15	7060/200.8	tpc*	60 days
Cadmium	7440-43-9	5	7131A/200.8	tpc	60 days

Constituent	CASN	Permit PQL ($\mu\text{g/l}$)	Analytical Method	Sample Type	Sampling Frequency
Chloride	16887-00-6	1,000	9056/300	tpc	60 days
Cobalt	7440-48-4	70	6010	tpc	60 days
Cyanide	57-12-5	50	335	grab	60 days
Gross Beta Part. Act.	N/A	4 pCi/L	lab specific	tpc	60 days
Lead	7439-92-1	10	7421/200.8	tpc	60 days
Manganese	7439-96-5	50	6010	tpc	60 days
Nitrate	14797-55-8	100	9056/300	grab	60 days
Nitrite	14797-65-0	100	9056/300	grab	60 days
Phosphorus	7723-14-0	50	365	tpc	60 days
pH	N/A	0.1 pH units	9040A/150.1	grab/tpc	60 days
Total Dissolved Solids	N/A	10,000	160.1	tpc	60 days
Total Organic Halides	N/A	20	8260	grab	60 days
Tritium	N/A	460pCi/L	lab specific	grab	60 days

* tpc = time proportional composite

6.3 Groundwater Analysis

The requirements of this section apply to the groundwater monitoring well sample points listed in Section D.1.2.

Groundwater samples will be analyzed for the following:

Constituent	CASN	Permit PQL ($\mu\text{g/l}$)	Analytical Method	Sample Type	Sampling Frequency
Alkalinity	N/A	10,000	310.1	grab	quarterly
Cadmium	7440-43-9	5	7131A/200.8	grab	60 days
Chromium	7440-47-3	20	7191/200.8	grab	quarterly
Lead	7439-92-1	10	7421/200.8	grab	quarterly
Mercury	7439-97-6	2	7470/7471	grab	quarterly
pH	N/A	0.1 pH units	field measure	grab	quarterly
Sulfate	14808-79-8	10,000	375	grab	quarterly

Constituent	CASN	Permit PQL ($\mu\text{g/l}$)	Analytical Method	Sample Type	Sampling Frequency
Total Organic Carbon	7440-44-0	1,000	415.1	grab	quarterly

G.4 Batch Source Sampling

The requirements of this section apply to the batch samples taken from the FMEF 36B system and 36D system as described in Section D.1.3.

The analytical requirements prior to batch discharge are as follows:

Constituent	CASN	Permit PQL ($\mu\text{g/l}$)	Analytical Methods	Sample Type	Sampling Frequency
Copper	7440-50-8	70	6010/200.7/ 200.8	grab	prior to discharge
pH	N/A	0.1 pH units	9040A/150.1	grab	prior to discharge
Selenium	7782-49-2	20	7741	grab	prior to discharge
Zinc	7440-66-6	20	6010	grab	prior to discharge

Regulatory Compliance will authorize the discharge of each batch to the 400 Area Process Sewer upon verification of acceptable results from the sample analysis. Analytical data will be submitted to Ecology within 30 days of discharge.

G.5 Sample Handling

Samples will be collected in commercially available, individually certified, precleaned glass or plastic containers. The certification of the precleaned condition shall accompany the container. The sample volumes and number of containers are prescribed by the analytical laboratory and are subject to change. Container types and preservatives are discussed in the facility-specific sampling procedure, "Procedure for Collecting RCRA/CERCLA Samples From the 400 Area Secondary Cooling Water (Process Sewer) System."

Preservatives required above will be vendor supplied and added to the containers by Sampling and Mobile Laboratories personnel. The caps will be sealed to the containers with tamper-evident tape. The preservative will be added to the containers in laboratory environment prior to being taken to the field. The containers will be labeled, then individually bagged and rebagged. The containers will be labeled, then packaged in accordance with the

"Hazardous Material Packaging and Shipping Manual," WHC-CM-2-14 and the "Radiation Protection Manual," WHC-CM-4-11.

Sample bottles will also be prepared for field quality control samples. The facility-specific field sampling procedure identifies this preparation and analytes to be evaluated for each field quality control sample.

Field notes will be kept by sampling personnel who will identify date, time, weather conditions, and any other relevant information from each sampling event.

Custody of the samples is initiated at the time of sample collection. A sample may consist of several containers. The Chain-of-Custody will account for each container and a separate form will be filled out for each cooler. Once the sample has been drawn, it must be in the physical control or view of the custodian, locked in an area where it can not be tampered with, or prepared for shipping with tamper-evident tape applied. The definition of physical control includes being in the sight of the custodian, being in a room which will signal an alarm when entered, or being locked in a cabinet.

When more than one person is involved in sampling, one person alone shall be designated to sign as sampler. The sampler is the custodian until the samples are transferred to another location or group; he or she shall sign when releasing the samples to the designated receiver. Any private carrier used to transport the samples and Chain-of-Custody documentation shall be bonded.

The samples will be routed to an approved Hanford Company participant contractor or subcontractor laboratory for analysis consistent with SW-846 or EPA-600/4-79-019 requirements.

The data will be considered representative so long as at least 90 percent of the data points meet the established requirements in the laboratory contract for precision and accuracy. Data which does not meet this objective will be reviewed to determine whether the data can be used or whether corrective action should be taken. Corrective action measures are described in section H.4. If necessary, corrective action will consist of repeating the sampling and/or analysis activity. Validated data will be sent by AS to Administrative Records. The data will be part of the administrative record for Tri-Party Agreement Milestone M-17-16. An electronic database (LEMIS) for management of this data is being developed and will be accessible by EPA and Ecology.

All sampling and analytical data will be maintained by the sampling task leader as quality records. The field logs will be maintained by Sampling and Mobile Laboratories. Copies of the Sample Analysis Request Form, Chain-of-Custody, and activity screening results will be sent to AS. The original shipping papers will accompany the sample. Copies of the Sample Analysis Request form and Chain-of-Custody form will be returned to AS from the laboratory after the samples are received. The original shipping papers will be kept by the laboratory, and the copies maintained by AS.

H. QUALITY ASSURANCE

H.1 Objectives

The QA objectives address the test measures that will be taken to achieve analytical results of known and acceptable quality. The QA objectives, as described in WHC-SD-EN-SPP-002, are target levels for precision, accuracy, representativeness, and completeness.

H.2 Procedures

Effluent sampling will be performed in a manner that provides representative measurements of the volume and concentration of contaminants. All sampling activities will be conducted in accordance with the guidance provided in SW-846; *Test Methods for Evaluating Solid Waste Physical/Chemical Methods (EPA 1897b)* and EPA 600/4-82-029, *Handbook for Sampling and Sample Preservation of Water and Wastewater (EPA 1982b)*, and shall conform to the latest revision of the "Guidelines Establishing Test Procedures for the Analysis of Pollutants," contained in 40 CFR Part 136.

The samples collected under this program will follow the sampling procedure found in WHC-CM-7-7, *Environmental Investigation and Site Characterization Manual* and adhere to the requirements of the Manchester Environmental Laboratory, Lab Users Manual, Washington State Department of Ecology, 4th edition, January 1994.

H.2.1 Calibration Procedures

Calibration of all WHC measuring equipment, whether in the existing inventory or purchased for effluent sampling, shall be controlled as required by WHC-CM-4-2, *Westinghouse Hanford Company Quality Assurance Manual*, QR 12.0, "Control of Instruments," and "Quality Instruction," QI 12.2, "Operator Calibrated Measuring and Test Equipment." Equipment calibration will be conducted according to manufacturer's recommendations unless otherwise directed to address unique conditions at the facilities. Also, for some streams the only sampling equipment is a long rod and sample bottles. No calibration procedure will be required for this method.

H.2.2 Preventive Maintenance Procedures

Measurement and testing equipment used in the field and laboratory that directly affect the quality of the analytical data shall be subject to preventive maintenance measures that ensure minimization of measurement system downtime and maximize performance. When field equipment maintenance is necessary, instructions shall be as defined by approved procedures. (Flowmeters are not available for some effluent streams. Also, the only sampling equipment for some streams are a long rod and sample bottles. For these cases, preventive maintenance will not be required.) Laboratories shall be responsible for performing or managing the maintenance of their analytical equipment. Maintenance requirements, spare parts lists, and instructions

shall be included in individual methods or in laboratory Quality Assurance/Quality Control (QA/QC) plans subject to RL contractor review and approval.

H.3 Sample Custody

All samples taken by Sampling and Mobile Laboratory during the course of the characterization program shall be controlled by field tracking documentation from the point of origin to the analytical laboratory. Field tracking documentation and guidance is specified in WHC-CM-7-7, *Environmental Investigations and Site Characterization Manual*, Sections EII 5.1, "Chain of Custody," and EII 1.5, "Field Logbooks."

A designated sample custodian accepts custody of the shipped samples, verifies that the sample numbers match those on the "Chain of Custody" form, and verifies that the custody seals were in place and intact upon receipt of the shipping container. Pertinent information as to the shipment method and courier is entered in the "remarks" section. The samples are then tracked according to the sample custody procedures as specified in the QA/QC plan for the analytical laboratory.

H.4 Data Validation

The samples will be taken and shipped to the analytical laboratory by the Sampling and Mobile Laboratory with the coordination of the facilities. The Analytical Laboratory shall be responsible for preparing an analytical laboratory data package.

Several levels of data have been developed for *Resource Conservation and Recovery Act of 1976* (RCRA) data packages. These data validation procedures are described in "Data Validation Procedures for Chemical Analysis." The data package shall include the information necessary to perform data validation to the extent indicated by the minimum requirements of Validation Level B. The data packages shall be prepared in legible, reproducible format; any changes must be initialed and dated. In general, all analytical laboratory data packages should include the following:

- Sample receipt and tracking documentation, including copies of chain of custody forms, identification of the organization and individuals performing the analysis, the names and signatures of the responsible analysts, sample holding time requirements, references to applicable chain of custody procedures, and the dates of sample receipt, extraction, and analysis.
- Quality Control (QC) data, as appropriate for the methods used, including matrix spike/matrix spike duplicate data, recovery percentages, precision data, laboratory blank data, and identification of any nonconformance that may have affected the laboratory's measurement system during the analysis time period.

- The analytical results or data deliverables, including reduced data, reduction formulas, or algorithms.
- Results of data assessment including central tendency and dispersion, measures of variability, and significant tests. Also, data quality indicators of precision, accuracy, and completeness will be included.
- Other supporting information, such as calibration data, reconstructed ion chromatographs, spectrograms, traffic reports, and raw data, needs to be included in the submittal of individual data packages.

All sample data shall be retained by the analytical laboratory and made available for systems or program audits at the request of the RL contractor, EPA, RL, or Ecology representatives. Such data shall be retained by the analytical laboratory through the duration of the authorization work order, or the period of their contractual statement of work; at that point it shall be turned over to archiving within the RL contractor.

The completed data package shall be reviewed and approved by the analytical laboratory's QA manager before submittal for validation. The requirements of this section shall be included in procurement documentation or work orders, as appropriate, in compliance with the standard WHC procurement control procedures.

H.5 Performance and System Audits

In general, analytical samples shall be subject to in-process QC measures in both field and laboratory. Audits, in the form of system surveillances, shall be performed to evaluate field activities for compliance with established QA program and procedure requirements.

System surveillances are performed in accordance with FFTF QA surveillance schedules. System surveillances shall be implemented through the use of WHC-CM-4-5, *Quality Assurance Qualifications and Instructions*, QAI 10.4, "Surveillance." Additional performance or system audits shall be performed if necessary as a consequence of corrective action requirements.

Any discrepancies observed during the evaluation of performance audit results or during system audit surveillance activities shall be documented on a surveillance report and resolved in compliance with procedure QAI 10.4, "Surveillance."

The internal QC checks performed by the analytical laboratories shall meet the requirements specified in the laboratory QA/QC plan and SW-846 (EPA 1987b).

H.6 Corrective Action

Corrective action required as a result of surveillance or audit activity shall be documented and dispositioned as required by WHC-CM-4-2, *Westinghouse Hanford Company Quality Assurance Manual*, QR 15.0, "Control of Nonconforming

Items;" QI 15.1, "Nonconforming Item Reporting;" QI 15.2, "Nonconformance Report Processing;" QR 16.0, "Corrective Action;" QI 16.1, "Trending/Trend Analysis;" WHC-CM-4-5, "*Quality Assurance Qualifications and Instructions*;" QAI 10.4, "Surveillance;" and WHC-CM-7-6, "*Environmental Compliance Verification Program Manual*". Copies of all surveillance, nonconformance, audit, and corrective action documentation are QA records and shall be maintained on completion or closure.

H.7 Quality Assurance Reports

As stated in Section 10.0, liquid effluent stream activities shall be regularly assessed by surveillance and auditing processes. Surveillance, nonconformance, audit, and corrective action documentation shall be considered QA records and shall be documented and dispositioned as such. Records management requirements applicable to subcontractors or participant contractors shall be defined in applicable procurement documents or work orders.

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WHC 1988, *Environmental Investigations and Site Characterizations Manual*, WHC-CM-7-7, Westinghouse Hanford Company, Richland, Washington.

WHC 1988c, *Westinghouse Hanford Company Quality Assurance Manual*, WHC-CM-4-2, Westinghouse Hanford Company, Richland, Washington.

WHC 1988d, *Environmental Compliance Verification Program Manual*, WHC-CM-7-6, Westinghouse Hanford Company, Richland, Washington.

WHC 1989, *400 Area Secondary Cooling Water Stream-Specific Report*, WHC-EP-0342, Addendum 28, Westinghouse Hanford Company, Richland, Washington.

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WHC 1996, *Data Validation Procedures for Chemical Analyses,*
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J. ACRONYMS

AS	Analytical Services
CASN	Chemical Abstract System Registration Number
CERCLA	<i>Comprehensive Environmental Response, Compensation, and Liability Act of 1980</i>
CFR	Code of Federal Regulations
DOE	U.S. Department of Energy
DL	Detection Limit
Ecology	State of Washington Department of Ecology
EPA	U.S. Environmental Protection Agency
FFTF	Fast Flux Test Facility
FMEF	Fuels and Materials Examination Facility
HEIS	Hanford Environmental Information System
HVAC	Heating, Ventilation and Air Conditioning
LDCV	Large Diameter Cleaning Vessel
LEMIS	Liquid Effluent Monitoring Information System
MASF	Maintenance and Storage Facility
MSDS	Material Safety Data Sheets
NFPA	National Fire Protection Association
OSM	Office of Sample Management
PQL	Practical Quantification Levels
QA	Quality Assurance
QAPP	Quality Assurance Program Plan
QA/QC	Quality Assurance/Quality Control
QC	Quality Control
RCRA	<i>Resource Conservation and Recovery Act of 1976</i>
RL	U.S. Department of Energy, Richland Operations Office
RLWS	Retention Liquid Waste System
SAP	Sampling and Analysis Plan
SWDP	State Waste Discharge Permit
TDS	Total Dissolved Solids
TOC	Total Organic Carbon
TOX	Total Organic Halides
Tri-Party Agreement	<i>Hanford Federal Facility Agreement and Consent Order</i>
VOA	Volatile Organic Analysis
WAC	Washington Administrative Code

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APPENDIX

MATERIAL SAFETY DATA SHEETS FOR DEARBORN PRODUCTS

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Customer No. 93337C 01
Ticket No. 093761

MSDS # 10767

Emergency Phone
708-438-1800

Material Safety Data Sheet

Section 1 Product Identification

TRADE NAME	DEARCODE 702	PRODUCT TYPE	Bioicide	CODE IDENT.	14-120
DOT SHIPPING NAME	Corrosive Liquid NDS (Contains 5-Chloro-2-Methyl-4-Isothiazolin-3-One)				

Section 2 Hazardous Ingredients

	CAS NUMBER	%	EXPOSURE CRITERIA
5-Chloro-2-methyl-4-isothiazolin-3-one	26172-55-4	1.15	Total isothiazolines (TUA: 0.1 mg/m ³)
2-Methyl-4-isothiazolin-3-one	2682-20-4	0.35	(STEL: 0.3 mg/m ³) (Manuf. recommend.)
Magnesium Chloride	7786-30-3	< 2.0	Not established
Magnesium Nitrate	10377-60-3	< 3.0	Not established
Water	7732-18-5	< 96.0	Not established

X B UN 1760 IT

HMIS 3-0-0

EPA REGISTRATION NO. 4643-40

Section 3 Physical Data

BOILING POINT, 760 mm Hg	212 F	MELTING POINT	NA
FREEZING POINT	32 F	VAPOR PRESSURE	20 mm Hg est.
SPECIFIC GRAVITY (H ₂ O = 1)	1.01	SOLUBILITY IN H ₂ O	soluble
VAPOR DENSITY (AIR = 1)	0.8 est.	EVAPORATION RATE, (Bu Ac = 1)	1
% VOLATILES BY VOLUME	ND	pH	3.5-4.5
APPEARANCE & ODOR			

Pale amber to green liquid, pungent odor.

Section 4 Fire & Explosion Hazard Data

FLASH POINT (8 METHOD USED)	FLAMMABLE LIMITS IN AIR % BY VOLUME	AUTO IGNITION TEMPERATURE
NA, water-based product	LOWER NA UPPER NA	NA
EXTINGUISHING MEDIA:	FOAM CO2 DRY CHEMICAL	

SPECIAL FIRE FIGHTING PROCEDURES:

Wear respirator (pressure-demand, self-contained breathing apparatus; MSHA/NIOSH approved or equivalent) and full protective gear. Use water spray to cool fire and exposed containers.

UNUSUAL FIRE AND EXPLOSION HAZARD:

Avoid exposure to fumes and vapors from a fire--can possibly include sulfur dioxide, hydrogen chloride, and oxides of nitrogen.

Section 5 Reactivity Data

STABILITY (NORMAL CONDITIONS)	CONDITIONS TO AVOID
Stable	Evaporation to drums: nitrates can explode
INCOMPATIBILITY (MATERIALS TO AVOID)	

Oxidizing agents, reducing agents, amines and isocyanates

HAZARDOUS DECOMPOSITION PRODUCTS

Thermal decomposition products may include hydrogen chloride, oxides of sulfur and oxides of nitrogen.

HAZARDOUS POLYMERIZATION	CONDITIONS TO AVOID
Will not occur	Not applicable

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Section 6

Information

MSDS #010767**TOXICITY INFORMATION:**

Oral LD50 rat: 3.61 g/kg. Dermal LD50 rabbit: >5 g/kg. Eye irritation rabbit: corrosive, corneal injury. Skin irritation rabbit: corrosive under test conditions. For DDT skin corrosiveness. Toxicity based on 1.5% active ingredient.

EFFECTS OF OVEREXPOSURE:

INHALATION: Inhalation of mist will irritate respiratory passages.

INGESTION: Harmful if swallowed.

SKIN CONTACT: Corrosive to skin; causes burns. Harmful if absorbed through skin.

EYE CONTACT: Corrosive to eyes; causes permanent, irreversible eye injury.

DELAYED EFFECTS: Substance can cause allergic skin reaction.

EMERGENCY AND FIRST AID PROCEDURES

INHALATION: Remove affected person to fresh air and treat symptoms.

INGESTION: Do not induce vomiting. If conscious, drink promptly a large quantity of egg white and gelatin solution or, if these are not available, drink large quantities of water. Call physician immediately.

SKIN CONTACT: Wash thoroughly with soap and water. Remove and wash clothing before reuse. Discard shoes and other leather clothing articles.

EYE CONTACT: Flush eyes with a large amount of water for at least 15 minutes. Get prompt medical attention.

NOTE: Mucosal damage may contraindicate the use of gastric lavage. Measures against circulatory shock, respiratory depression & convulsions may be required.

Section 7 Special Precaution Information**VENTILATION REQUIREMENTS**

Use adequate mechanical ventilation.

RESPIRATORY PROTECTION (SPECIFY TYPE)

MSHA/NIOSH approved OV/DM respirator if exposure criteria is exceeded.

EYE PROTECTION

Splash-proof goggles & face shield

GLOVES

Impervious (Rubber recommended)

OTHER PROTECTIVE CLOTHING AND EQUIPMENT

Long sleeve work shirt and pants, chemical-protective apron and boots

Eye-wash and chemical shower should be near.

Section 8 Spill or Leak Procedures**STEPS TO TAKE IF MATERIAL IS RELEASED OR SPILLED**

Wear protective clothing, splash-proof goggles & impervious overshoes. Remove contaminated clothing promptly; launder thoroughly before reuse. Wash affected skin areas with soap and water. **CAUTION:** Keep spills out of municipal sewers and open bodies of water. Dike and absorb spill with inert material (dry earth, sand). Shovel all contaminated solids (diking material, absorbent and soil) into corrosion-proof drums for storage until disposal.

WASTE DISPOSAL METHOD

Recommended method of disposal: incinerate unwanted product and contaminated diking material, at a permitted facility, in accordance with Federal, local, and state regulations.

Refer to product label for additional disposal information.

This product is not formulated with chemicals subject to the reporting requirements of Section 313 of the Emergency Planning and Community Right-to-Know Act of 1986 and of 40 CFR 372.

Section 9 Special Precautions**PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE**

Do not contaminate water, food or feed by storage or disposal.

Keep containers closed when not in use. Wash thoroughly after handling.

Do not store product in steel containers.

OTHER PRECAUTIONS

FOR INDUSTRIAL USE ONLY. KEEP OUT OF REACH OF CHILDREN.

PREPARED BY: K. RUTHE

DATE: 4/27/94

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Material Safety Data Sheet

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708-438-1800

Section 1 Product Identification

TRADE NAME	CODE 550	PRODUCT TYPE	CODE IDENT.
DOT SHIPPING NAME		Sodium Thiosulfate 0.1N	33-550
Chemicals M. O. I., Water Testing Reagent			

Section 2 Hazardous Ingredients

	CAS NUMBER	%	EXPOSURE CRITERIA
Sodium Thiosulfate	10102-17-2	0.5	Not established
Sodium Borate	1336-43-4	0.05	Not established
Water	7732-18-5	> 99	Not applicable

MSDS # 012925

HMIS 0-0-0

Section 3 Physical Data

BOILING POINT, 760 mm Hg	212 F	MELTING POINT	NA
FREEZING POINT	ND	VAPOR PRESSURE	ND
SPECIFIC GRAVITY (H ₂ O=1)	1.0	SOLUBILITY IN H ₂ O	Miscible
VAPOR DENSITY (AIR=1)	ND	EVAPORATION RATE, Bu Ac=1	1
% VOLATILES BY VOLUME	ND	pH	8 - 10
APPEARANCE & COLOR			

Clear, colorless liquid.

Section 4 Fire & Explosion Hazard Data

FLASH POINT (1 & METHOD USED)	FLAMMABLE LIMITS IN AIR % BY VOLUME	AUTO IGNITION TEMPERATURE
Not applicable	LOWER NA UPPER NA	NA

EXTINGUISHING MEDIA: WATER FOG
SPECIAL FIRE FIGHTING PROCEDURES:

Firefighters should wear full protective gear including self contained breathing apparatus.

UNUSUAL FIRE AND EXPLOSION HAZARD:

None known

Section 5 Reactivity Data

STABILITY (NORMAL CONDITIONS)	CONDITIONS TO AVOID
Stable	Not determined

INCOMPATIBILITY (MATERIALS TO AVOID)

Acids, alkaloidal, metallic salts and silver halides

HAZARDOUS DECOMPOSITION PRODUCTS

None known

HAZARDOUS POLYMERIZATION

Will not occur

CONDITIONS TO AVOID

Not applicable

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Section 6 Health Hazard Information

TOXICITY INFORMATION:

No TLV established for product. See Section 2 for component information.

EFFECTS OF OVEREXPOSURE:

INHALATION: Avoid breathing vapors or mist which may irritate respiratory passages.

INGESTION: May be harmful if swallowed.

SKIN CONTACT: Prolonged or frequent skin contact may cause irritation.

EMERGENCY AND FIRST AID PROCEDURES

INHALATION: Remove affected persons to fresh air. MSDS # 012925

INGESTION: Call physician.

SKIN CONTACT: Flush skin with water, then wash with soap and water. Wash contaminated clothing before reuse.

EYE CONTACT: Immediately flush eyes with water for 15 minutes. Call physician.

Section 7 Special Protection Information

VENTILATION REQUIREMENTS

Use adequate mechanical ventilation.

RESPIRATORY PROTECTION (SPECIFY TYPE)

None specified

EYE PROTECTION

Safety glasses

GLOVES

Disposable latex

OTHER PROTECTIVE CLOTHING AND EQUIPMENT

Lab coat or long sleeve work shirt and pants.

Section 8 Spill or Leak Procedures

STEPS TO TAKE IF MATERIAL IS RELEASED OR SPILLED

Dilute with large amount of water. Wash down drain with excess water.

WASTE DISPOSAL METHOD

Dispose of in accordance with federal, state and local regulations.

This product is not formulated with chemicals subject to the reporting requirements of Section 313 of the Emergency Planning and Community Right-to-Know Act of 1986 and of 40 CFR 372.

Ingredients classified as EPA hazardous waste under 40 CFR 261: not applicable

CERCLA reportable quantity of product: none

Section 9 Special Precautions

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

Wash thoroughly after handling. Avoid contact with eyes, skin, clothing. Protect containers from physical damage.

OTHER PRECAUTIONS

FOR INDUSTRIAL USE ONLY. KEEP OUT OF REACH OF CHILDREN.

PREPARED BY: R. RUTH

DATE: 10/13/93

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Material Safety Data Sheet

Emergency Phone
708-438-1800**Section 1 Product Identification**

TRADE NAME	CODE 595	PRODUCT TYPE	Hydrochloric Acid (1M)	CODE IDENT.	33-595
DOT SHIPPING NAME	Hydrochloric acid, solution, corrosive liquid UN 1789				

Section 2 Hazardous Ingredients

	CAS NUMBER	%	EXPOSURE CRITERIA
Hydrochloric acid	7647-01-0	C5	Ceiling limit: 5 ppm
Water	7732-18-5	> 95	Not established

MSDS # 012927

HMIS 3-0-0

Section 3 Physical Data

BOILING POINT, 760 mm Hg	212 F	MELTING POINT	NA
FREEZING POINT	ND	VAPOR PRESSURE	ND
SPECIFIC GRAVITY (H ₂ O=1)	1.08	SOLUBILITY IN H ₂ O	Complete
VAPOR DENSITY (AIR=1)	ND	EVAPORATION RATE (Bu Acc=1)	NA
%VOLATILES BY VOLUME	ND	pH	1
APPEARANCE & ODOR			

Colorless to pale yellow liquid with pungent odor.

Section 4 Fire & Explosion Hazard Data

FLASH POINT (S&M METHOD USED)	FLAMMABLE LIMITS IN AIR % BY VOLUME	AUTO IGNITION TEMPERATURE
Not applicable	LOWER NA UPPER NA	NA
EXTINGUISHING MEDIA:	WATER FOG	
SPECIAL FIRE FIGHTING PROCEDURES:		

Firefighters should wear full protective gear.

UNUSUAL FIRE AND EXPLOSION HAZARD:

None known.

Section 5 Reactivity Data

STABILITY (NORMAL CONDITIONS)	CONDITIONS TO AVOID
Stable	Keep containers closed.
INCOMPATIBILITY (MATERIALS TO AVOID)	
Silver, lead, mercury salts, metals, strong alkali	

HAZARDOUS DECOMPOSITION PRODUCTS

Chlorine gas, hydrogen gas if allowed to react with metal.

HAZARDOUS POLYMERIZATION	CONDITIONS TO AVOID
Will not occur	Not applicable

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Section 6 Health Hazard Information

TOXICITY INFORMATION:

Exposure level not established for product. See Section 2 for component information.

EFFECTS OF OVEREXPOSURE:

MSDS # 012927

INHALATION: Inhalation of mist may irritate respiratory passages.

INGESTION: Harmful if swallowed; corrosive liquid may cause tissue damage.

SKIN CONTACT: Prolonged or frequent skin contact will cause irritation and may cause chemical burns.

EYE CONTACT: Will cause irritation; may be severe and may cause tissue damage.

EMERGENCY AND FIRST AID PROCEDURES

INHALATION: Remove affected persons to fresh air and treat symptoms.

INGESTION: DO NOT induce vomiting. Give large quantities of water. Give at least one ounce of milk of magnesia in an equal amount of water, or three egg whites. Call physician.

SKIN CONTACT: Flush skin with water then wash with soap and water. Launder contaminated clothing before reuse.

EYE CONTACT: Flush eyes with water for 15 minutes. Call physician.

Section 7 Special Protection Information

VENTILATION REQUIREMENTS

Use adequate mechanical ventilation.

RESPIRATORY PROTECTION (SPECIFY TYPE)

Hood recommended

EYE PROTECTION

Face shield or chemical goggles

GLOVES

Disposable latex

OTHER PROTECTIVE CLOTHING AND EQUIPMENT

Lab coat or long sleeve work shirt.

Section 8 Spill or Leak Procedures

STEPS TO TAKE IF MATERIAL IS RELEASED OR SPILLED

Neutralize spill with sodium bicarbonate or a soda ash-slaked lime mixture (50-50). Mix to form a slurry. Scoop and wash down the drain with excess water. Wash site of spill with soda and ash solution.

WASTE DISPOSAL METHOD

Dispose of in accordance with federal, state and local regulations.

Untreated product is considered an EPA corrosive hazardous waste, D002 (40 CFR 261), at disposal.

Contains 5% of hydrochloric acid, CAS NO. 7647-01-0, which may require reporting under section 313 of SARA Title III and 40 CFR 372.

CERCLA reportable quantity of product: 1115 gal.

Section 9 Special Precautions

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

Store containers closed away from extreme temperatures.

OTHER PRECAUTIONS

FOR INDUSTRIAL USE ONLY. KEEP OUT OF REACH OF CHILDREN.

PREPARED BY: H. RUTHE

DATE: 10/11/93

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Material Safety Data Sheet

Emergency Phone
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Section 1 Product Identification

TRADE NAME	CODE 899	PRODUCT TYPE	CODE IDENT.
		Interference Suppressor	33-899
DOT SHIPPING NAME			
Chemical N. O. I. Water Testing Reagent			

Section 2 Hazardous Ingredients

	CAS NUMBER	%	EXPOSURE CRITERIA
Beryllium Sulfate	13510-49-1	C 5	TWA - 0.002 ag/m ³ (as Be) (See Section 6)

MSDS # 012928

HMIS 2-0-0

Section 3 Physical Data

BOILING POINT, 760 mm Hg	212 F	MELTING POINT	NA
FREEZING POINT	ND	VAPOR PRESSURE	ND
SPECIFIC GRAVITY (H ₂ O=1)	0.75	SOLUBILITY IN H ₂ O	Appreciable
VAPOR DENSITY (AIR=1)	ND	EVAPORATION RATE, (Bu Acc=1)	C 1
%VOLATILES BY VOLUME	ND	pH	S - 7

APPEARANCE & ODOR

Clear, colorless, odorless liquid

Section 4 Fire & Explosion Hazard Data

FLASH POINT (& METHOD USED)	FLAMMABLE LIMITS IN AIR % BY VOLUME	AUTO IGNITION TEMPERATURE
Not applicable	NA LOWER NA UPPER	NA
EXTINGUISHING MEDIA:	WATER FUG FUM	CO ₂ DRY CHEMICAL

SPECIAL FIRE FIGHTING PROCEDURES:

Firefighters should wear full protective gear including self contained breathing apparatus.

UNUSUAL FIRE AND EXPLOSION HAZARD:

None known

Section 5 Reactivity Data

STABILITY (NORMAL CONDITIONS)	CONDITIONS TO AVOID
Stable	Heat
INCOMPATIBILITY (MATERIALS TO AVOID)	
Caustic	

HAZARDOUS DECOMPOSITION PRODUCTS

Sulfur oxides

HAZARDOUS POLYMERIZATION	CONDITIONS TO AVOID
Will not occur	Not determined

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Material Safety Data Sheet (continued)

CODE 899

CONTINUED

Section 6 Health Hazard Information

TOXICITY INFORMATION:

Exposure level not established for product. See Section 2 for component information. Beryllium is listed by IARC and NTP as a suspect animal carcinogen.

EFFECTS OF OVEREXPOSURE:

INHALATION: Inhalation of mist may irritate respiratory passages.

INGESTION: May be harmful if swallowed.

MSDS # 012928

SKIN CONTACT: Prolonged or frequent skin contact may cause irritation.

EYE CONTACT: May cause irritation on direct contact.

EMERGENCY AND FIRST AID PROCEDURES

INHALATION: Remove affected person to fresh air and treat symptoms.

INGESTION: If conscious, give water to dilute and contact physician immediately.

SKIN CONTACT: Wash affected area with soap and water. Remove contaminated clothing and launder before reuse.

EYE CONTACT: Flush with water for 15 minutes and seek medical attention.

Section 7 Special Protection Information

VENTILATION REQUIREMENTS

Use adequate mechanical ventilation (lab hood) to remain below exposure criteria

RESPIRATORY PROTECTION (SPECIFY TYPE)

Wear NIOSH/MSHA approved HEPA respirator if misting of reagent occurs.

EYE PROTECTION

Chemical goggles

GLOVES

Butyl Rubber

OTHER PROTECTIVE CLOTHING AND EQUIPMENT

Lab coat or long sleeve work shirt.

Section 8 Spill or Leak Procedures

STEPS TO TAKE IF MATERIAL IS RELEASED OR SPILLED

Collect on absorbent paper and dispose of with laboratory waste.
Wash area of spill with water.

WASTE DISPOSAL METHOD

Dispose of in accordance with federal, state and local regulations.

Contains C SX of beryllium sulfate, CAS NO. 13510-49-1, which may require reporting under Section 313 of SARA Title III and 40 CFR 372 as beryllium.

The CERCLA reportable quantity of beryllium compounds is 1 lb.

Ingredients classified as EPA hazardous waste under 40 CFR 261: beryllium (P015).

Section 9 Special Precautions

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

Wash thoroughly after handling. Store container closed when not in use.

OTHER PRECAUTIONS

FOR INDUSTRIAL USE ONLY. KEEP OUT OF REACH OF CHILDREN.

PREPARED BY: R. Rutherford

DATE: 10/28/93

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Material Safety Data SheetEmergency Phone
708-438-1800**Section 1 Product Identification**

TRADE NAME	CODE 562	PRODUCT TYPE	CODE IDENT.
DOT SHIPPING NAME	Chemicals N.O.I., Water Testing Reagents	Xylenol Orange Indicator	33-562

Section 2 Hazardous Ingredients

	CAS NUMBER	%	EXPOSURE CRITERIA
Potassium Chloride	7447-40-7	>99	Not established
Xylenol Orange	3618-43-7	<0.1	Not established

MSDS # 016069

HMIS 0-0-0

Section 3 Physical Data

BOILING POINT, 760 mm Hg	NA	MELTING POINT	ND
FREEZING POINT	ND	VAPOR PRESSURE	ND
SPECIFIC GRAVITY (H ₂ O=1)	2.0	SOLUBILITY IN H ₂ O	complete
VAPOR DENSITY (AIR=1)	3.0	EVAPORATION RATE (BuAci)	very low
EVOLATILES BY VOLUME	0	at 5% solution	7.0
APPEARANCE & ODOR			

Purple, odorless powder

Section 4 Fire & Explosion Hazard Data

FLASH POINT (S METHOD USED)	FLAMMABLE LIMITS IN AIR BY VOLUME	AUTO IGNITION TEMPERATURE
Not applicable	LOWER NA UPPER	NA

EXTINGUISHING MEDIA: WATER FOG
SPECIAL FIRE FIGHTING PROCEDURES:

Firefighters should wear full protective gear including self contained breathing apparatus.

UNUSUAL FIRE AND EXPLOSION HAZARD:

None known.

Section 5 Reactivity Data

STABILITY (NORMAL CONDITIONS)	CONDITIONS TO AVOID
Stable	Moisture

INCOMPATIBILITY (MATERIALS TO AVOID)

Silver solutions

HAZARDOUS DECOMPOSITION PRODUCTS

Not determined

HAZARDOUS POLYMERIZATION

Will not occur

CONDITIONS TO AVOID

Not applicable

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Material Safety Data Sheet (continued)

CODE 562

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Section 6: Health Hazard Information

TOXICITY INFORMATION:

No TLV established for product. See Section 2 for component information.

EFFECTS OF OVEREXPOSURE:

INHALATION: Inhalation of powder may irritate respiratory tract.

SKIN CONTACT: Prolonged or frequent skin contact may cause irritation.

INGESTION: May be harmful if swallowed.

MSDS # 016069

EMERGENCY AND FIRST AID PROCEDURES

INHALATION: Remove affected persons to fresh air and treat symptoms.

INGESTION: Give large quantities of water or milk. Call physician.

SKIN CONTACT: Flush with water for 15 minutes. Wash with soap and water. Remove contaminated clothing and wash before reuse.

EYE CONTACT: Immediately flush with water for 15 minutes. Call physician.

Section 7: Special Protection Information

VENTILATION REQUIREMENTS

Use adequate mechanical ventilation.

RESPIRATORY PROTECTION (SPECIFY TYPE)

Usually not needed

EYE PROTECTION

Safety glasses

GLOVES

Disposable latex

OTHER PROTECTIVE CLOTHING AND EQUIPMENT

Lab coat or long sleeve work shirt and pants.

Section 8: Spill or Leak Procedures

STEPS TO TAKE IF MATERIAL IS RELEASED OR SPILLED

Flush to drain with excess water

WASTE DISPOSAL METHOD

Dispose of in accordance with Federal, state and local regulations.

This product is not formulated with chemicals subject to the reporting requirements of Section 313 of the Emergency Planning and Community Right-to-Know Act of 1986 and of 40 CFR 372.

Ingredients classified as EPA hazardous waste under 40 CFR 361: not applicable

CERCLA reportable quantity of product: none

Section 9: Special Precautions

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

Store containers closed away from extreme temperatures.

OTHER PRECAUTIONS

FOR INDUSTRIAL USE ONLY. KEEP OUT OF REACH OF CHILDREN.

PREPARED BY: R. Ruthe

DATE: 10/11/93

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Material Safety Data Sheet (continued)

CODE 904

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Section 6 Health Hazard Information

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TOXICITY INFORMATION:

No TLV established for product. See Section 2 for component information.

EFFECTS OF OVEREXPOSURE:

INHALATION: Inhalation of mist may irritate respiratory passages.

INGESTION: May be harmful if swallowed.

SKIN CONTACT: Prolonged or frequent skin contact may cause irritation.

EYE CONTACT: Will cause irritation.

MSDS # 016348

EMERGENCY AND FIRST AID PROCEDURES

INHALATION: Remove affected persons to fresh air & treat symptoms.

INGESTION: If conscious, give water to dilute & contact physician.

SKIN CONTACT: Flush skin with water then wash with soap and water. Wash contaminated clothing before reuse.

EYE CONTACT: Immediately flush eyes with water for 15 minutes. Call physician.

Section 7 Special Protection Information

VENTILATION REQUIREMENTS

Use adequate mechanical ventilation.

RESPIRATORY PROTECTION (SPECIFY TYPE)

None special

EYE PROTECTION

Safety glasses

GLOVES

Disposable latex

OTHER PROTECTIVE CLOTHING AND EQUIPMENT

Lab Coat or long sleeve work shirt.

Section 8 Spill or Leak Procedures

STEPS TO TAKE IF MATERIAL IS RELEASED OR SPILLED

Dilute with large amount of water. Wash down drain with excess water.

WASTE DISPOSAL METHOD

Dispose of in accordance with federal, state and local regulations.

Check with state or local department of radiation control; in most states this product is NOT classified as a radioactive waste.

Contains 0.05% of thorium nitrate, CAS NO. 13823-29-5, nitrate compounds (water dissociable), which may require reporting under section 313 of SARA Title III and 40 CFR 372.

Section 9 Special Precautions

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

Store containers closed away from extreme temperatures.

OTHER PRECAUTIONS

FOR INDUSTRIAL USE ONLY. KEEP OUT OF REACH OF CHILDREN.

PREPARED BY: R. RUTH

DATE: 2/24/95

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Material Safety Data SheetEmergency Phone
708-438-1800**Section 1 Product Identification**

TRADE NAME	CODE 904	PRODUCT TYPE	Thorium Nitrate (0.001M)	CASE IDENT.
DOT SHIPPING NAME		CHEMICALS, NO1, WATER TESTING REAGENTS		

Section 2 Hazardous Ingredients

	CAS NUMBER	%	EXPOSURE CRITERIA
Thorium Nitrate	13823-29-5	<0.05	Not established
Water	7732-18-5	> 99	Not established

The level of alpha radiation of Code 904 thorium nitrate is equivalent to 0.000025 microcuries per gram. Alpha radiation does not penetrate the skin.

MSDS # **016348****Section 3 Physical Data**

BOILING POINT, 760 mm Hg	212 F	MELTING POINT	ND
FREEZING POINT	ND	VAPOR PRESSURE	ND
SPECIFIC GRAVITY (H ₂ O=1)	1.0	SOLUBILITY IN H ₂ O	Miscible
VAPOR DENSITY (AIR=1)	ND	EVAPORATION RATE (Bu Ac=1)	<1
%VOLATILES BY VOLUME	>99	pH	4-5

APPEARANCE & ODOR

Clear, colorless, odorless solution.

Section 4 Fire & Explosion Hazard Data

FLASH POINT (& METHOD USED)	FLAMMABLE LIMITS IN A.R.% BY VOLUME		AUTO IGNITION TEMPERATURE
Not applicable	NA LOWER	NA UPPER	NA

EXTINGUISHING MEDIA: WATER FOG

SPECIAL FIRE FIGHTING PROCEDURES:

Firefighters should wear full protective gear including self contained breathing apparatus.

UNUSUAL FIRE AND EXPLOSION HAZARD:

None special

Section 5 Reactivity Data

STABILITY (NORMAL CONDITIONS)	CONDITIONS TO AVOID
Stable	Not determined

INCOMPATIBILITY (MATERIALS TO AVOID)

Soluble Fluorides

HAZARDOUS DECOMPOSITION PRODUCTS

Not determined

HAZARDOUS POLYMERIZATION

Will not occur

CONDITIONS TO AVOID

Not determined

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WH1050

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Material Safety Data Sheet

Emergency Phone
708-438-1800

Section 1 Product Identification

TRADE NAME	CODE 575	PRODUCT TYPE	CODE IDENT.
DOT SHIPPING NAME		Specific Conductance #	33-575
Chemicals M.O.I. Water Testing Reagents			

Section 2 Hazardous Ingredients

	CAS NUMBER	%	EXPOSURE CRITERIA
Potassium chloride	7447-40-7	0.05	Not established
Water	7732-18-5	99.95	Not established

* Standard - 1000 umhos

MSDS # **017053A**

HMIS 0-0-0

Section 3 Physical Data

BOILING POINT, 760 mm Hg	212 F	MELTING POINT	NA
FREEZING POINT	ND	VAPOR PRESSURE	ND
SPECIFIC GRAVITY (H ₂ O = 1)	1.0	SOLUBILITY IN H ₂ O	miscible
VAPOR DENSITY (AIR = 1)	ND	EVAPORATION RATE, (Bu Ac = 1)	<1
% VOLATILES BY VOLUME	ND	pH	6 - 8
APPEARANCE & ODOR			

Clear, colorless, odorless liquid

Section 4 Fire & Explosion Hazard Data

FLASH POINT (METHOD USED)	FLAMMABLE LIMITS IN AIR % BY VOLUME		AUTO IGNITION TEMPERATURE
Not applicable	LOWER	UPPER	NA
	NA	NA	
EXTINGUISHING MEDIA:	WATER FOR FOAM CO ₂ DRY CHEMICAL		
SPECIAL FIRE FIGHTING PROCEDURES:			

Firefighters should wear full protective gear including self contained breathing apparatus.

UNUSUAL FIRE AND EXPLOSION HAZARD:

None known

Section 5 Reactivity Data

STABILITY (NORMAL CONDITIONS)	CONDITIONS TO AVOID
Stable	Not determined
INCOMPATIBILITY (MATERIALS TO AVOID)	

Strong oxidizing agents

HAZARDOUS DECOMPOSITION PRODUCTS

Not determined

HAZARDOUS POLYMERIZATION	CONDITIONS TO AVOID
Will not occur	Not applicable

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Section 6 **Special Protection Information**

TOXICITY INFORMATION:

Exposure level not established for product

MSDS # 017053A

EFFECTS OF OVEREXPOSURE:

INHALATION: Inhalation of mist may irritate respiratory passages.

INGESTION: May be harmful if swallowed.

SKIN CONTACT: Prolonged or frequent skin contact may cause irritation.

EYE CONTACT: Direct contact with product may cause irritation.

EMERGENCY AND FIRST AID PROCEDURES

INHALATION: Remove affected persons to fresh air and treat symptoms.

INGESTION: If conscious, give water to dilute & contact physician.

SKIN CONTACT: Wash with soap & water. Remove contaminated clothing and wash before reuse.

EYE CONTACT: Flush eyes with water for 15 minutes. Contact physician.

Section 7 **Special Protection Information**

VENTILATION REQUIREMENTS

Use adequate mechanical ventilation.

RESPIRATORY PROTECTION (SPECIFY TYPE)

None required

EYE PROTECTION

Safety glasses

GLOVES

Disposable latex

OTHER PROTECTIVE CLOTHING AND EQUIPMENT

Lab coat or long sleeved shirt.

Section 8 **Spill or Leak Procedures**

STEPS TO TAKE IF MATERIAL IS RELEASED OR SPILLED

Dilute with large amount of water. Wash down drain with excess water.

WASTE DISPOSAL METHOD

Dispose of in accordance with Federal, State and local regulations.

This product is not formulated with chemicals subject to the reporting requirements of Section 313 of the Emergency Planning and Community Right-to-Know Act of 1986 and of 40 CFR 372.

Product as sold not considered an EPA hazardous waste nor does it contain ingredients classified as hazardous waste in 40 CFR 261.

Section 9 **Special Precautions**

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

Store containers closed away from extreme temperatures.

OTHER PRECAUTIONS

FOR INDUSTRIAL USE ONLY. KEEP OUT OF REACH OF CHILDREN.

PREPARED BY: K. Kutha

DATE: 11/15/93

The data included herein are presented according to W. R. Grace & Co.'s practices current at the time of preparation thereof, and made available solely for the consideration, investigation and utilization at the original recipient's hazard and do not constitute a representation or warranty for which Grace assumes legal responsibility. It is the responsibility of a recipient of this data to remain currently informed on chemical hazard information, to design and update its own safety program and to comply with all national, federal, state, and local laws and regulations applicable to safety, occupational health, right to know and environmental protection.

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WHC-SD-FF-PLN-002, REV 5
Page 43Customer No. 933370 01
Ticket No. 062768

Material Safety Data Sheet

Emergency Phone
1-800-323-7551

Section 1 Product Identification		
TRADE NAME	DEARBORN 878	PRODUCT TYPE
DOT SHIPPING NAME	Compound industrial process water treating, liquid	COOLING WATER TREATMENT
		CODE IDENT
		11-878

Section 2 Hazardous Ingredients		
	CAS NUMBER	% EXPOSURE CRITERIA
Organophosphonic acid, potassium salt	67933-76-8	< 10 Not established

MSDS # 022946

Section 3 Physical Data			
BOILING POINT, 760 mm Hg	212 F	MELTING POINT	NA
FREEZING POINT	28 F	VAPOR PRESSURE	21 mm Hg
SPECIFIC GRAVITY (H ₂ O=1)	1.10	SOLUBILITY IN H ₂ O	Complete
VAPOR DENSITY (A _{ir} =1)	ND	EVAPORATION RATE (B _y A _{ir} =1)	< 1
EVOLATILES BY VOLUME	ND	pH	10.35
APPEARANCE & ODOR			

Pale yellow liquid

Section 4 Fire & Explosion Hazard Data		
FLASH POINT (S & METHOD USED)	FLAMMABLE LIMITS IN AIR % BY VOLUME	AUTO IGNITION TEMPERATURE
NA, water-based product	NA LOWER NA UPPER	NA
EXTINGUISHING MEDIA:	FURN	CO ₂ DRY CHEMICAL
SPECIAL FIRE FIGHTING PROCEDURES:		

Firefighters should wear full protective gear including self contained breathing apparatus.

UNUSUAL FIRE AND EXPLOSION HAZARD:

None known

Section 5 Reactivity Data	
STABILITY (NORMAL CONDITIONS)	CONDITIONS TO AVOID
Stable	Extreme heat
INCOMPATIBILITY (WATER ALS TO AVOID):	

Acids, oxidizers

HAZARDOUS DECOMPOSITION PRODUCTS

Thermal decomposition products may include carbon monoxide and carbon dioxide.

HAZARDOUS POLYMERIZATION
Will not occurCONDITIONS TO AVOID
Not applicable

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Material Safety Data Sheet (continued)

DEARBORN 878

REV 5 PG 44

CONTINUED

Section 6

TOXICITY INFORMATION

Exposure level not established for product.

MSDS # 022946

EFFECTS OF OVEREXPOSURE:

INHALATION: Inhalation of mist may irritate respiratory passages.

INGESTION: May be harmful if swallowed.

SKIN CONTACT: Prolonged or frequent skin contact may cause irritation.

EYE CONTACT: Direct contact with product may cause irritation.

EMERGENCY AND FIRST AID PROCEDURES

INHALATION: Remove affected person to fresh air and treat symptoms.

INGESTION: If conscious, give water to dilute and contact physician immediately.

SKIN CONTACT: Wash with soap & water. Remove contaminated clothing and wash before reuse.

EYE CONTACT: Flush with water for 15 minutes and seek medical attention.

Section 7

VENTILATION REQUIREMENTS

Use adequate mechanical ventilation.

RESPIRATORY PROTECTION (SPECIFY TYPE)

None special under normal use conditions and practices.

EYE PROTECTION

Chemical goggles

Gloves Impervious (Rubber recommended)

OTHER PROTECTIVE CLOTHING AND EQUIPMENT

Eye wash should be near.

Long sleeve work shirt and pants.

Section 8

STEPS TO TAKE IF MATERIAL IS RELEASED OR SPILLED

Wear protective clothing. Dike spill and soak up on an inert absorbent material. Flush area of spill with water.

WASTE DISPOSAL METHOD

Dispose of in accordance with federal, state and local regulations.

This product is not formulated with chemicals subject to the reporting requirements of Section 313 of the Emergency Planning and Community Right-to-Know Act of 1986 and of 40 CFR 372.

Product as sold not considered an EPA hazardous waste nor does it contain ingredients classified as hazardous waste in 40 CFR 261.

Product does not contain ingredients with CERCLA reportable quantities.

Section 9

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

Store containers closed away from extreme temperatures.

OTHER PRECAUTIONS

FOR INDUSTRIAL USE ONLY. KEEP OUT OF REACH OF CHILDREN.

PREPARED BY: Jeff Hayes

DATE 1/11/96

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Van Waters & Rogers Inc.
**** Material Safety Data Sheet ****

Date: 05/10/96

Time: 13:53:21

To: BILL SMITH
WESTINGHOUSE HANFORD C

Fax: 1509-373-0559

From: MICHAEL SMITH

Phone: 509-534-0405

Re: MSDS - SODIUM HYPOCHLORITE 7-15*

MSDS # 023398

REMARKS:

Fax Cover Sheet

Including this cover sheet, you should receive 6 pages.

For emergency assistance involving chemicals,
call CHEMTREC - (800) 424-9300

Van Waters & Rogers, subsidiary of UNIVAR
6100 Carillon Point, Kirkland, WA 98033 206-889-3400

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003 04/21/93 SODIUM HYPOCHLORITE 7-154

WHC-SD-FF-PLN-002, REV 5
Page 46PRODUCT NAME:
SODIUM HYPOCHLORITE 7-154

MSDS #: CK622680

I. PRODUCT IDENTIFICATION

PRODUCT NAME: SODIUM HYPOCHLORITE 7-154
SYNONYMS: Liquid chlorine, liquid bleach, Pure Chlor, Sunny Sol 150
CHEMICAL FAMILY: Hypochlorite
FORMULA: NaOCl in water
DESCRIPTION: Swimming pool chlorinator, Microbicide
OTHER HAZARD CLASSIFICATION: Oxidizer, unstable (reactive), corrosive
to skin and eyes, lung toxin

II. COMPONENT DATA

PRODUCT COMPOSITION

CAS or CHEMICAL NAME: Sodium hypochlorite
CAS NUMBER: 7681-52-9
PERCENTAGE RANGE: 7-15
HAZARDOUS PER 29 CFR 1910.1200: Yes
EXPOSURE STANDARDS: None Established
CAS or CHEMICAL NAME: Water
CAS NUMBER: 7732-18-5
PERCENTAGE RANGE: 73-87
HAZARDOUS PER 29 CFR 1910.1200: No
EXPOSURE STANDARDS: None Established
CAS or CHEMICAL NAME: Sodium hydroxide
CAS NUMBER: 1310-73-2
PERCENTAGE RANGE: 0.5-2.5
HAZARDOUS PER 29 CFR 1910.1200: Yes
EXPOSURE STANDARDS:

MSDS # 023398

OSHA (PEL)
PPM mg/cubic-meter
TWA: None Established
CEILING: 2
STEL: None Established
CAS or CHEMICAL NAME: Sodium chloride
CAS NUMBER: 7647-14-5
PERCENTAGE RANGE: 5.0-11.0
HAZARDOUS PER 29 CFR 1910.1200: No
EXPOSURE STANDARDS: None Established

ACGIH (TLV)
PPM mg/cubic-meter
None Established
2
None Established

III. PRECAUTIONS FOR SAFE HANDLING AND STORAGE

DO NOT TAKE INTERNALLY. AVOID CONTACT WITH SKIN OR EYES, UPON CONTACT
WITH SKIN OR EYES, WASH OFF WITH WATER
STORAGE CONDITIONS: Store in a cool, dry, well-ventilated area. Avoid high
temperatures and exposure to and direct sunlight.
DO NOT STORE AT TEMPERATURES ABOVE: 15-21 Deg.C (60-70 Deg.F)
OTHER: Store in the dark at the lowest possible temperature, but keep
from freezing.

PRODUCT STABILITY AND COMPATIBILITY

SHELF LIFE LIMITATIONS: Up to 6 months at 60 Deg.F. or lower
INCOMPATIBLE MATERIALS FOR PACKAGING: Metal containers
INCOMPATIBLE MATERIALS FOR STORAGE OR TRANSPORT: Oxidizers, acids,
nitrogen containing materials such as quaternary ammonium salts.

IV. PHYSICAL DATA

APPEARANCE: Greenish-yellow liquid
FREEZING POINT: No Data
BOILING POINT: Decomposes on heating
DECOMPOSITION TEMPERATURE: Decomposes as heated
SPECIFIC GRAVITY: 1.08-1.26

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Site-specific

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BULK DENSITY: Not Applicable
pH @ 25 DEG.C: > 11
VAPOR PRESSURE @ 25 DEG.C: No Data
SOLUBILITY IN WATER: Miscible
VOLATILES, PERCENT BY VOLUME: 87.5-94.5
EVAPORATION RATE: No Data
VAPOR DENSITY: No Data
MOLECULAR WEIGHT: 74.5 (active ingredient-NaOCl)
ODOR: Chlorine-like
COEFFICIENT OF OIL/WATER DISTRIBUTION: No Data

MSDS # 023398

V. PERSONAL PROTECTIVE EQUIPMENT REQUIREMENTS

PERSONAL PROTECTION FOR ROUTINE USE OF PRODUCT:

RESPIRATORY PROTECTION: Respirator protection not normally needed since the volatility and toxicity are low. If vapors, mists, or aerosols are generated, wear a NIOSH/MSHA approved respirator.

VENTILATION: Local exhaust ventilation is recommended if vapors, mists or aerosols are generated. Otherwise, use general exhaust ventilation.

SKIN PROTECTIVE EQUIPMENT: Use chemical safety goggles and impermeable gloves.

EQUIPMENT SPECIFICATIONS:

RESPIRATOR TYPE: NIOSH/MSHA approved respirator equipped with chemical cartridges for protection against chlorine gas and dust mist pre-filters.

GLOVE TYPE: Neoprene

BOOT TYPE: Not normally needed

APRON TYPE: Not normally needed

PROTECTIVE SUIT: Not normally needed

VI. FIRE AND EXPLOSION HAZARD INFORMATION

FLAMMABILITY DATA:

FLAMMABLE: No

COMBUSTIBLE: No

PYROPHORIC: No

FLASH POINT: Not Applicable

AUTOIGNITION TEMPERATURE: Not Applicable

FLAMMABLE LIMITS AT NORMAL ATMOSPHERIC TEMPERATURE AND PRESSURE (PERCENT

VOLUME IN AIR): LEL - Not Applicable UEL - Not Applicable

NFPA RATINGS: Not Established

HMIS RATINGS:

Health: 3

Flammability: 0

Reactivity: 2

EXTINGUISHING MEDIA: Not applicable

FIRE FIGHTING TECHNIQUES AND COMMENTS: Use water to cool containers exposed to fire. On small fire, use dry chemical, carbon dioxide or water spray. On large fires, use water in flooding quantities as fog. In case of fire, hazardous concentrations of chlorine may be formed. See Section XI for personal protective equipment for fire fighting.

VII. REACTIVITY INFORMATION

CONDITIONS UNDER WHICH THIS PRODUCT MAY BE UNSTABLE

TEMPERATURES ABOVE: Decomposes as it is heated

MECHANICAL SHOCK OR IMPACT: No

ELECTRICAL (STATIC) DISCHARGE: No

OTHER: Decomposition will result from contact with iron or copper

HAZARDOUS POLYMERIZATION: Will not occur

INCOMPATIBLE MATERIALS: Iron, copper, acids, ammonium compounds,

organics, other oxidizers

HAZARDOUS DECOMPOSITION PRODUCTS: Chlorine gas

OTHER CONDITIONS TO AVOID: High heat, sunlight and ultra-violet light

SUMMARY OF REACTIVITY:

OXIDIZER: Yes

PYROPHORIC: No

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ORGANIC PEROXIDE: No

WATER REACTIVE: No

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VIII. FIRST AID

- EYES:** Immediately flush with large amounts of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Call a physician at once.
- SKIN:** Immediately flush with water for at least 15 minutes. Call a physician. If clothing comes in contact with the product, the clothing should be removed immediately and should be laundered before re-use.
- INGESTION:** Immediately drink large quantities of water. DO NOT induce vomiting. Call a physician at once. DO NOT give anything by mouth if the person is unconscious or if having convulsions.
- INHALATION:** If person experiences nausea, headache or dizziness, person should stop work immediately and move to fresh air until these symptoms disappear. If breathing is difficult, administer oxygen, keep the person warm and at rest. Call a physician. In the event that an individual inhales enough vapor to lose consciousness, person should be moved to fresh air at once and a physician should be called immediately. If breathing has stopped, artificial respiration should be given immediately. In all cases, ensure adequate ventilation and provide respiratory protection before the person returns to work.

IX. TOXICOLOGY AND HEALTH INFORMATION

ROUTES OF ABSORPTION

Inhalation, skin, eye, ingestion

WARNING STATEMENTS AND WARNING PROPERTIES

HARMFUL IF INHALED OR INGESTED. HARMFUL IF EXPOSED TO SKIN OR EYES.

HUMAN THRESHOLD RESPONSE DATA

ODOR THRESHOLD: Approximately 0.9 mg/m³ (0.3 ppm) based on odor of chlorine.

IRRITATION THRESHOLD: There is no data for irritation threshold. Sodium hypochlorite has the potential to be immediately dangerous to life or health.

SIGNS, SYMPTOMS, AND EFFECTS OF EXPOSURE

INHALATION

ACUTE:

Inhalation of this material is irritating to the nose, mouth, throat and lungs. It may also cause burns to the respiratory tract with the production of lung edema which can result in shortness of breath, wheezing, choking, chest pain, and impairment of lung function. Inhalation of high concentrations can result in permanent lung damage.

CHRONIC:

Repeated inhalation exposure may cause impairment of lung function and permanent lung damage.

EYE

Severe irritation and/or burns can occur following eye exposure.

Contact may cause impairment of vision and corneal damage.

SKIN

ACUTE:

Dermal exposure can cause severe irritation and/or burns characterized by redness, swelling and scab formation. Prolonged skin exposure may cause destruction of the dermis with impairment of the skin at site of contact to regenerate.

CHRONIC:

Effects from chronic skin exposure would be similar to those from single exposure except for effects secondary to tissue destruction.

INGESTION

ACUTE:

Irritation and/or burns can occur to the entire gastrointestinal tract, including the stomach and intestines, characterized by nausea, vomiting, diarrhea, abdominal pain, bleeding, and/or tissue ulceration.

CHRONIC:

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There are no known or reported effects from chronic exposure.

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MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE

Asthma and respiratory and cardiovascular disease

INTERACTIONS WITH OTHER CHEMICALS WHICH ENHANCE TOXICITY

None known or reported.

ANIMAL TOXICOLOGY**ACUTE TOXICITY:**

INHALATION LC50: No available data

ORAL LD50: Approximately 3-5 g/kg (rat)

DERMAL LD50: > 2 g/kg (rabbit)

Causes burns to eyes and skin

AQUATIC TOXICITY:

Aquatic LC50 - approximately 0.6 mg/l (bluegill)

approximately 1 mg/l (daphnia, 48 hours)

CHRONIC TOXICITY:

There are no known or reported effects from repeated exposure.

REPRODUCTIVE TOXICITY:

There are no known or reported effects on reproductive function or fetal development.

CARCINOGENICITY:

This product has been shown not to be carcinogenic. It is not included as a carcinogen by IARC, OSHA, NTP, or EPA.

MUTAGENICITY:

Sodium hypochlorite has been shown to produce damage to genetic material when tested in vitro. Studies in vivo have shown no evidence of mutagenic potential for this material. Chemicals with potent biocidal activity, typical of hypochlorite compounds, may compromise the integrity of many of the treated cells which remain viable during an in vitro assay. This result would likely produce cellular changes giving rise to a response indicative of mutation. It is judged that the risk of genetic damage is insignificant for sodium hypochlorite because of its biocidal activity, lack of mutagenicity in vivo, and failure to produce a carcinogenic response.

X. TRANSPORTATION INFORMATION

THIS MATERIAL IS REGULATED AS A DOT HAZARDOUS MATERIAL.

DOT DESCRIPTION FROM THE HAZARDOUS MATERIALS TABLE 49 CFR 172.101:

LAND (U.S.-DOT): HYPOCHLORITE SOLUTIONS, 8, UN1791, PG II

WATER (IMO): Same as above

AIR (IATA/ICAO): Same as above

HAZARD LABEL/PLACARD: CORROSIVE

REPORTABLE QUANTITY: 100 lbs. (Per 49 CFR 172.101, Appendix)

EMERGENCY GUIDE NO: 60

XI. SPILL AND LEAKAGE PROCEDURES

FOR ALL TRANSPORTATION ACCIDENTS, CALL CHEMTREC AT 800-424-9300

REPORTABLE QUANTITY (POUNDS): 100 lbs. (Per 40 CFR 302.4)

SPILL MITIGATION PROCEDURES:

Hazardous concentrations in air may be found in local spill area and immediately downwind.

AIR RELEASE: Vapors may be suppressed by the use of a water fog. Capture all run off water for treatment and disposal.

WATER RELEASE: This material is soluble in water. Dike or contain material via use of compatible absorbents. Remove material with use of vacuum or pump operation and treat before disposition. This material is harmful to aquatic life.

LAND SPILL: Compatible absorbents: Sand, clay soil, commercial absorbents

SPILL RESIDUES:

Dispose of per guidelines under Section XII, WASTE DISPOSAL.

PERSONAL PROTECTION FOR EMERGENCY SPILL AND FIRE-FIGHTING SITUATIONS:

Response to this material requires the use of self contained breathing apparatus (SCBA).

Additional protective clothing must be worn to prevent personal contact with this material. These items include but are not limited to boots,

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gloves, hard hat, impervious clothing, i.e. chemically impermeable suit. PG 50.
Compatible materials for response to this material are neoprene, butyl
rubber, viton and saranex.

MSDS # 023398**XII. WASTE DISPOSAL**

If this product becomes a waste, it DOES NOT meet the criteria of a hazardous waste as defined under 40 CFR 261, in that it does not exhibit the characteristics of hazardous waste of Subpart C, nor is it listed as a hazardous waste under Subpart D.

As a nonhazardous liquid waste, it should be disposed of in accordance with local, state and federal regulations by treatment in a wastewater treatment system.

CARE MUST BE TAKEN TO PREVENT ENVIRONMENTAL CONTAMINATION FROM THE USE OF THIS MATERIAL. THE USER OF THIS MATERIAL HAS THE RESPONSIBILITY TO DISPOSE OF UNUSED MATERIAL, RESIDUES AND CONTAINERS IN COMPLIANCE WITH ALL RELEVANT LOCAL, STATE AND FEDERAL LAWS AND REGULATIONS REGARDING TREATMENT, STORAGE AND DISPOSAL FOR HAZARDOUS AND NONHAZARDOUS WASTES.

XIII. ADDITIONAL REGULATORY STATUS INFORMATION

TOXIC SUBSTANCES CONTROL ACT: This substance is listed on the Toxic Substances Control Act inventory.

SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT TITLE III: None Established
HAZARD CATEGORIES, PER 40 CFR 370.2:

HEALTH:

Immediate (Acute)
Delayed (Chronic)

PHYSICAL:

Fire
Reactivity

EMERGENCY PLANNING AND COMMUNITY RIGHT TO KNOW, PER 40 CFR 355, APP.A:

EXTREMELY HAZARDOUS SUBSTANCE - THRESHOLD PLANNING QUANTITY:

None Established

SUPPLIER NOTIFICATION REQUIREMENTS, PER 40 CFR 372.45:

None Established

XIV. ADDITIONAL INFORMATION

MSDS REVISION STATUS: Transportation information updated

NOTICE

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*** END OF MSDS ***

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DISTRIBUTION

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Confederated Tribes of the Umatilla
Indian Nation
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Environmental Restoration/
Waste Management Program
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