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

JUL 01 1994

94-RPS-265

Mr. A. W. Conklin, Head
Air Emissions and Defense
Waste Section
State of Washington
Department of Health
Airdustrial Park Building 5, LE-13
Olympia, Washington 98504-0095

Mr. J. McCormick, Director
Air and Toxics Division
U.S. Environmental Protection Agency
Region 10
Mail Stop AT-082
1200 Sixth Avenue
Seattle, Washington 98101

Dear Messrs. Conklin and McCormick:

NOTICE OF CONSTRUCTION FOR THE B PLANT VACUUM LOADER

Enclosed is a Notice of Construction (NOC) for the B Plant Vacuum Loader for your review and approval. The NOC for the B Plant Vacuum Loader is being submitted pursuant to the requirements of 40 Code of Federal Regulations 61 and Washington Administrative Code 246-247-260.

The B Plant Vacuum Loader is manufactured by Guzzler Manufacturing Incorporated. The unit is truck-mounted and is capable of vacuuming the top layer of contaminated soil. The B Plant Vacuum Loader is located outside the contaminated area. Personnel mobilize and operate hoses attached to the B Plant Vacuum Loader in the contaminated area to collect the top layer of contaminated soil.

Use of the B Plant Vacuum Loader is anticipated in July 1994, pending approval by the State of Washington Department of Health (DOH) and the U.S. Environmental Protection Agency of the NOC enclosed with this letter. Future uses at other locations on the Hanford Site will meet the same conditions as outlined in this application. The estimated, unabated dose from the B Plant Vacuum Loader to the maximally exposed individual located 16,000 meters to the east of the 200 East Area at the Hanford Site boundary is 2.51 E-04 millirem per year.

The B Plant Vacuum Loader will be incorporated into the NOC for Portable/Temporary Radionuclide Air Emission Units following approval of the NOC by DOH.

JUL 01 1994

Should you have any questions or comments, please contact me or Mr. S. D. Stites of my staff on 376-8566.

Sincerely,

Steven H. Wisness, Acting Program Manager
Office of Environmental Assurance,
Permits, and Policy

EAP:SDS

Enclosure:
Notice of Construction

cc w/encl:
~~Administrative Records~~ DAI

cc w/o encl:
W. T. Dixon, WHC
J. J. Luke, WHC

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Cross Reference Between Notice of Construction and Appendix A of Washington Administrative Code 246-247

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1.0 Introduction

The B Plant Complex has purchased a portable vacuum/collection system [referred to throughout this document as a Truck-Mounted Vacuum Loader (TMVL)] to remove surface layers of soil from contaminated zones found at or near the B Plant Complex. The cleanup strategy is to mitigate further spreading of surface contamination while downgrading or reducing the size of existing contaminated zones. Initially, the TMVL will be used in the vicinity of the B Plant Complex; other Hanford Sites may be considered in the future, but only on an as-needed basis.

1.1 Notification Requirement and Guidance

This document serves as a Notice of Construction (NOC) pursuant to the requirements of Washington Administrative Code 246-247-060 and 40 Code of Federal Regulations (CFR) 61 for the use of a TMVL.

1.2 Facility Identification

U.S. Department of Energy
Richland Operations Office
Hanford Site
Richland, Washington 99352

The TMVL will be located and used at or near the B Plant Complex in the 200 East Area of the Hanford Site.

Responsible Manager:
Mr. S. H. Wisness, Acting Program Manager
Office of Environmental Assurance,
Policy, and Permits
U.S. Department of Energy,
Richland Operations Office
P.O. Box 550
Richland, Washington 99352

1.3 Type of Proposed Action

This NOC is for construction of a new emission unit at the B Plant Complex located in the 200 East Area of the Hanford Site.

The TMVL is similar to the Type I unit described in the Portable Temporary Radioactive Air Emission Unit (PTRAEU) NOC Application submitted to the State of Washington Department of Health (DOH) and the U.S. Environmental Protection Agency's Region 10 office on December 27, 1993.

Should the TMVL Application be approved before the PTRAEU, it will be incorporated into the PTRAEU Application. If both applications are approved at the same time, the TMVL Application will be appended to the PTRAEU Application and listed with other B Plant Complex units.

The TMVL unit is anticipated to begin operating in July 1994. Initially, the unit will be used at or in the immediate vicinity of the B Plant Complex. Future uses at other Hanford locations will meet the same conditions as outlined in this application and the PTRAEU Application.

1.4 State Environmental Policy Act Environmental (SEPA) Checklist

The TMVL is categorically exempt from the SEPA process. The unit will not handle any toxic or hazardous chemicals. Soils collected will only be radiologically contaminated.

2.0 Source Information

This section provides detailed information regarding the source and quantity of airborne radionuclide emissions resulting from operating the TMVL at the B Plant Complex.

2.1 Process Description

The TMVL is a portable industrial power vacuum system manufactured by Guzzler Manufacturing Incorporated headquartered in Birmingham, Alabama. The unit is completely self-contained with a diesel power source, positive displacement type vacuum pump, hydraulic and pneumatic control systems, multiple air filtration systems, and a dump-type hydraulically sealed payload collection tank.

The TMVL vehicle is never driven into contaminated areas but, rather, is stationed outside the contaminated area and lengths of hoses with nozzle attachments are used to reach materials to be collected.

Dirt from contaminated areas enters the unit through an eight inch porthole located at the rear of the equipment or through an overhead boom. Material collected is directed through a primary pre-filter plate separator which knocks the bulk of material out of the airstream in to the main payload compartment. From the main tank, the flow of air continues into the secondary pre-filter or mini-cyclone chamber.

Two mini-cyclones generate a high velocity vortex of particulate-laden air. The air is directed across the top of the mini-cyclone chamber and through a deflector plate, where the denser particles are knocked downward into the TMVL's collection hopper.

The now clean air flows across the plenum and down to the microstrainer housing, which contains a metal basket. The micro-strainer is the safety dropout point for any objects which may accidentally enter the filtration system during servicing. Finally, the air passes through the vacuum pump and out through the pump silencer and High Efficiency Particulate Air (HEPA) filter.

TABLE 1 - IDENTIFICATION INFORMATION

Unit Type	Number of Units	Identification Number	Flow Rate CFM	Uses	Characteristics
Vacuum Loader	1	G2411WAZ4116ZTC94	4,000	Surface Contamination Control	Plate Separator, Cyclone Separators, Baghouse, Micro Strainer, HEPA Filtration, 99.95 percent

NOTE: Information in Table 1 will be added to the PTRAEU Application.

2.2 Facility Inventory

The facility inventory is based on process knowledge of the operations conducted in the B Plant Complex. (References are found in Section 6 of the application.) Table 2 lists the radionuclides expected to be handled by the unit. These radionuclides are typical of the contamination expected to be found in the soil surrounding the B Plant Complex. Surveys will be performed to ensure that levels of radioactivity (source term) for this activity do not exceed those values set forth in Table 2.

Table 2 - Inventory

Radionuclide	Physical Form	Annual Possession Quantity (Ci/yr)
Cs 137	Particulate	7.20E+00
Sr 90	Particulate	1.80E+00

3.0 Unabated Release Rates

This section provides information regarding emission release rates from the TMVL without emission controls. Also included is the effective dose equivalent (EDE) to the maximally exposed individual (MEI) offsite resulting from unabated emissions.

3.1 Unabated Emissions

All airborne emissions will be in particulate form. The unabated emissions were calculated based on quantifying the level of contamination of the soil and the number of operating days to determine the Annual Possession Quantity. This Annual Possession Quantity was then multiplied by the 40 CFR 61 Appendix D factor for particulates.

Table 3 - Unabated Emissions

Radionuclide	Annual Possession Quantity Ci per Year	Appendix D Factor for Particulate	Annual Unabated Emissions (Ci/yr)
Cs 137	7.20E+00	.001	7.20E-03
Sr 90	1.80E+00	.001	1.80E-03

3.2 Unabated Dose

The unabated dose to the MEI (located 16 kilometers to the east of the 200 East Area at the Hanford Site boundary) is shown in Table 4. The unit dose factors included in the table were previously submitted to DOH. The information required to develop the unit dose factors from the Clean Air Assessment Package 1988 (CAP-88) computer code was also included in "Unit Dose Calculation Methods Summary of Facility Effluent Monitoring Plan Determinations." (WHC-EP-0498, 1991).

Table 4 - Unabated Dose

Radionuclide	Annual Unabated Emissions (Ci/yr)	CAP-88 Unit Dose Factor (mrem/Ci)	Annual Unabated Dose (mrem/yr)
Cs 137	7.20E-03	2.39E-02	1.72E-04
Sr 90	1.80E-03	4.38E-02	7.88E-05
		Sum Total	2.51E-04

4.0 Control and Monitoring Systems

This section contains information on both the emission control systems and the monitoring systems proposed for TMVL at the B Plant Complex.

4.1 Control System

The TMVL filtration system consists of several different control technologies linked "in series." The first system is the collector body and plate separator device at the air flow inlet to the collector body. The air flow path is split to reduce air speed for better cyclonic separation at the discharge of the collector body. The next system is a pair of cyclone separators. The separators are followed by two baghouses consisting of 72 bags each. The baghouse is equipped with a cyclic bag cleaning air blow back system designed to periodically clean the bags while the vacuum is operating. The baghouses are 99 percent efficient according to manufacturer's specifications. The next stage is a micro strainer device, which is positioned just before the vacuum pump. Following the vacuum pump, the last control device is a HEPA filter. The HEPA filter's efficiency is 99.95 percent.

4.2 Monitoring System

The system is not equipped with any monitoring. It is anticipated the material collected will be low level enough to allow for disposal of the material. The expected unabated dose to the MEI from operating the TMVL will be below 0.1 millirem (mrem) per year, therefore no monitoring is required. The operator will maintain records in accordance with the PTRAEU Application, which consists of logging the location, duration, daily hours of operation, and source type each time the unit is used. In addition, all changes of the filtration system will be recorded.

5.0 Abated Release Rates

This section provides information regarding emission release rates from the TMVL with emission controls in place. Also included is the EDE to the MEI offsite resulting from abated emissions.

5.1 Abated Emissions

The abated emissions were calculated from the Annual Unabated Emissions multiplied by the control efficiency of the baghouse and HEPA filtration. Because sample data describing the efficiency of a baghouse filter for control of particulate radionuclides is not available, the 40 CFR 61, Appendix D, adjustment factor of 0.1 was used. The treatment factor of 2,000 for the HEPA filter was used.

Table 5 - Abated Emission

Radionuclide	Annual Unabated Emissions (Ci/yr)	Control Equipment Adjustment Factor Baghouse Filters	Control Equipment Efficiency HEPA Filter	Annual Abated Emissions (Ci/yr)
Cs 137	7.20E-03	0.1	.0005	3.60E-08
Sr 90	1.80E-03	0.1	.0005	0.90E-08

NOTE: This is a new unit; there were no annual emissions last year.

5.2 Abated Dose

The abated dose to the MEI (located 16 kilometers to the east of the 200 East Area at the Hanford Site boundary) is shown in Table 6. The unit dose factors included in the table are described in Section 3.2.

Table 6 - Abated Dose

Radionuclide	Annual Abated Emissions (Ci/yr)	CAP-88 Unit Dose Factor (mrem/Ci)	Annual Abated Dose (mrem/yr)
Cs 137	3.60E-08	2.39E-02	8.60E-10
Sr 90	0.90E-08	4.38E-02	3.94E-10
		Sum Total	1.25E-09

The dose resulting from all Hanford Site operations in 1992, was determined to be 0.004 mrem per year for an individual located at Ringold (PNL 1993). The emissions resulting from operating the TMVL, and in conjunction with other operations at the Hanford Site, will not result in a violation of the National Emission Standard (NESHAPs) of ten mrem per year.

6.0 References

40 CFR 61, NESHAPs, Appendix D, December 1989.

PNL 1993, "Hanford Site Environmental Report for Calendar Year 1992," June 1993, PNL-8682, UC-602, Pacific Northwest Laboratory, Richland, Washington.

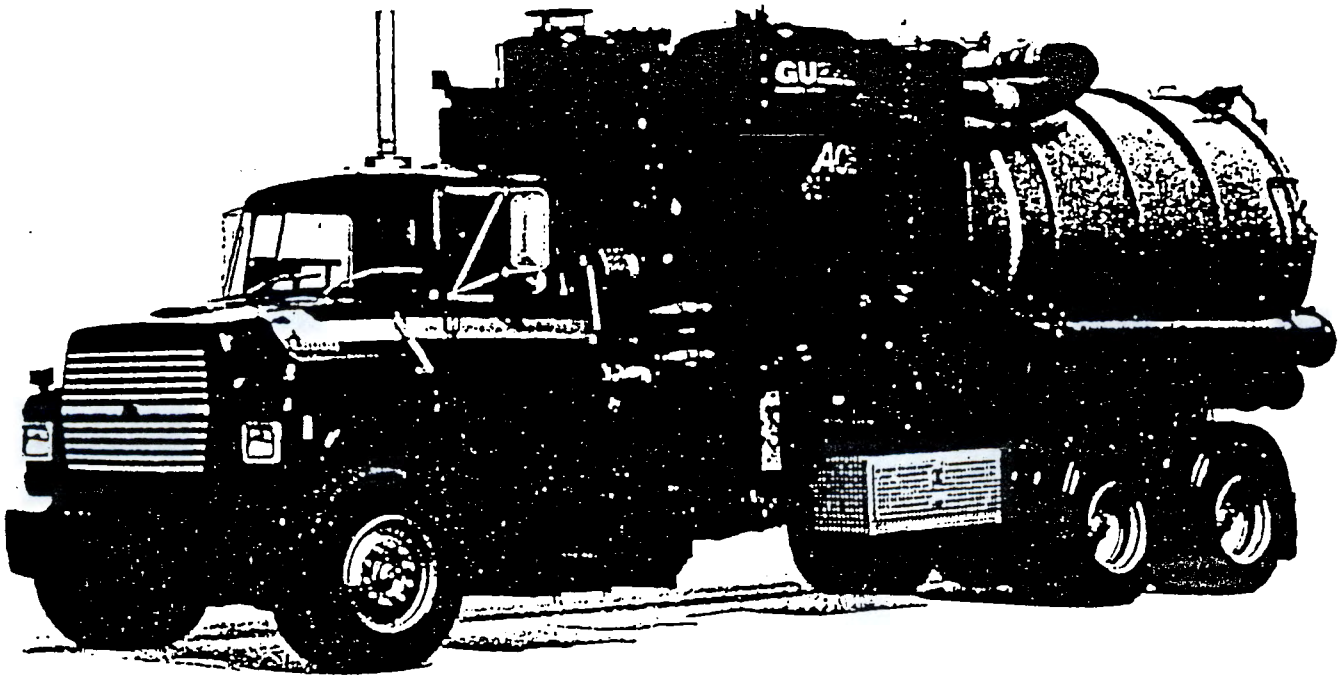
WHC 1991, "Unit Dose Calculation Methods Summary of Facility Effluent Monitoring Plan Determinations," November 1991, WHC-EP-0498, Westinghouse Hanford Company, Richland, Washington.

Internal Memo, 7E141-92-JAK-068, J. A. Koerner to Distribution, "Radionuclide Content of B Plant Canyon Waste," dated June 26, 1992.

Appendix A - Costs

The approximate cost of the vacuum loader was $300,000.00. The unit has three HEPA filters with replacement costs of $500.00 each. The unit has 144 bagfilters with replacement costs of $5.00 each. The maintenance cost for the filtration system cannot be determined until a maintenance schedule is completed. The total cost to replace all HEPA and bagfilters is $2,220.00.

ACE
ADAPTABLE COLLECTION EQUIPMENT



AVAILABLE AIRFLOWS: 3,000 - 7,000 CFM • AVAILABLE VACUUM: 15 - 27" HG
AVAILABLE CAPACITIES: 12 - 30 Cubic Yards • TRUCK OR TRAILER MOUNTED
OPTION PACKAGES: DOT HAZ WASTE • XCR SWING-OUT OR KNUCKLE BOOM

IMPROVED DESIGN

•STRONGER CONSTRUCTION - cylindrical cross-sections provide greater resistance to pressures associated with high vacuum.
•AERODYNAMIC FILTER MODULE - assures a complete discharge of material when dumping – no corners where material can collect.
•TAILGATE SYSTEM - is fully adjustable to compensate for gasket wear. New style chocks provide a mechanical lock for a leak-tight seal – even with heavy loads.
•TOP ACCESS DOORS - are power lift and easy swing away on all baghouse and cyclone chambers.
•SPLIT PATH AIRFLOW - reduces airspeed in the main tank and cyclones to allow for better material separation.
•DEBRIS TANK - is designed so that when the body is raised and the tailgate is opened, collected material can be bulk-load discharged into roll-off type boxes for transport and disposal.

BETTER PERFORMANCE

•HIGH VACUUM PUMP - 27" Roots Dresser pump developed for GUZZLER Manufacturing, is one of the most powerful positive displacement pumps available for handling heavy materials.
•HYDRAULIC SYSTEM - variable volume hydraulic pump provides quicker hydraulic response, generates less heat and requires less horsepower to operate.

BETTER FILTRATION

•5 STAGE FILTRATION - eliminates material carryover to vacuum pump (Radial Diverter, Vortex Prefilter, Dual Cyclones, Dual Baghouses & Microstrainer).
•MORE FILTER BAGS - 72 bags provides better air-to-cloth ratio and minimal overall system pressure drop for higher fuel efficiency.

EASIER MAINTENANCE

•BAGHOUSE ISOLATION - each baghouse can be isolated for in-field maintenance even while operating the system.
•UNIVERSAL GASKETS - all are D-ring hollow core gaskets that can be cut to fit and replaced in the field.
•TAILGATE HYDRAULICS - all check valves and needle valves are mounted in a single composite valve block for easy maintenance.
•EXTERNALLY ACCESSIBLE FLOAT BALL - top hatch allows access to debris tank float ball for cleaning or routine servicing.

LONGER LIFE

•MODULAR CONSTRUCTION - all filter module components including debris tank, baghouses, cyclones and dump tubes can be individually un-bolted and replaced if necessary.
•5 STAGE FILTRATION - extends life of the equipment by removing all material from the airstream before it reaches the vacuum pump.

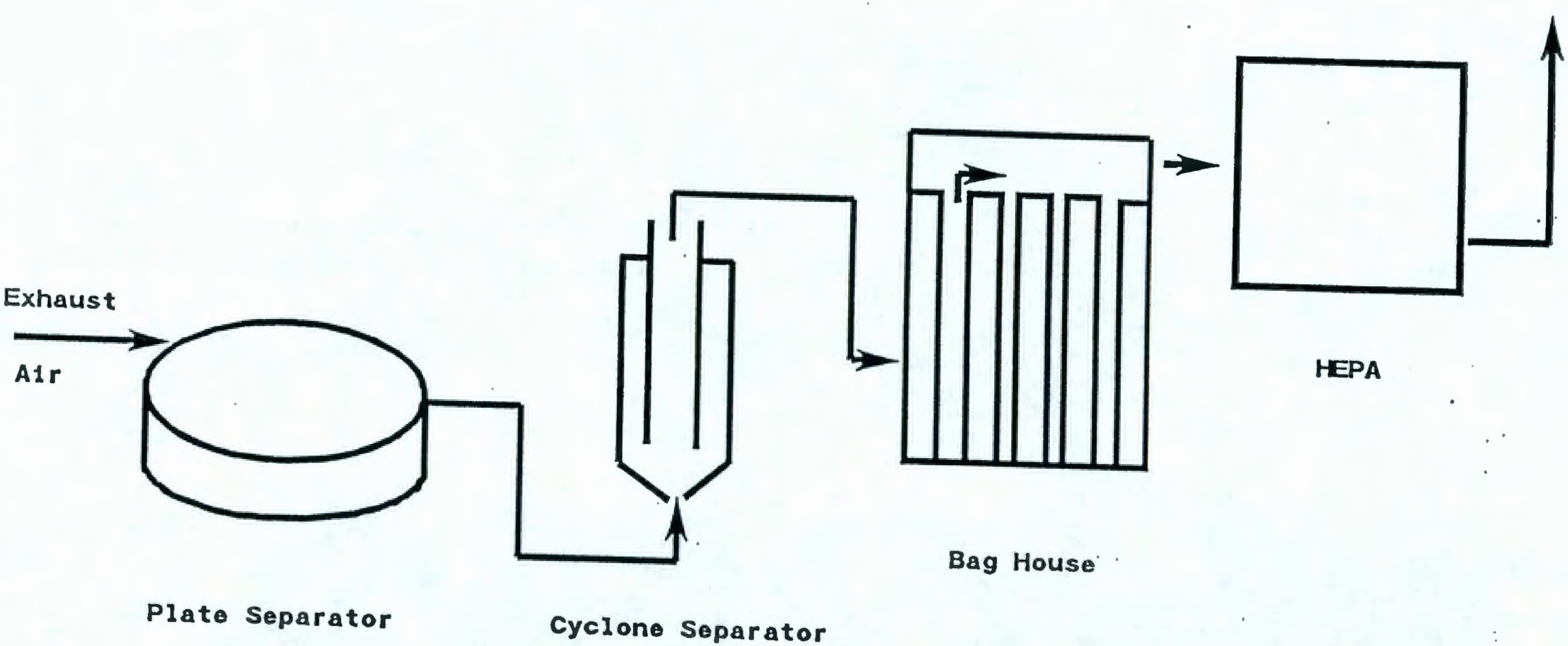
GUZZLER.
America's Leader in Power Vacuum Systems

GUZZLER Manufacturing, Inc. • 575 N 37th Street Birmingham, Al 35222 • 1-800-822-8785

9413290.2142

Radioactive Air Emissions
NOTICE OF CONSTRUCTION
Truck-Mounted Vacuum Loader

VACUUM LOADER FILTRATION SYSTEM



CORRESPONDENCE DISTRIBUTION COVERSHEET

Author	Addressee	Correspondence No.
S. H. Wisness, RL (M. J. Silvia, WHC)	A. W. Conklin, DOH J. McCormick, EPA	Incoming:9403819 Xref:9453470D

Subject: NOTICE OF CONSTRUCTION FOR THE B PLANT VACUUM LOADER

INTERNAL DISTRIBUTION

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		D. M. Bogen	S6-65	
		D. J. Carrell	H6-22	
		L. P. Diediker	T1-30	
		W. T. Dixon, Assignee	H6-21	
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		D. L. Halgren	S6-70	
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		H. E. McGuire, Sr. Staff	B3-63	
		M. J. Silvia	H6-25	
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		EPIC	H6-08	
		MJS/File/LB	H6-25	