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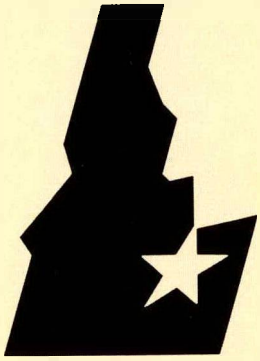

Idaho National Engineering Laboratory

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INFORMAL REPORT

ENVIRONMENTAL AUDIT OF THE HIGH PLAINS GRASSLANDS RESEARCH STATION CHEYENNE, WYOMING

EG&G Idaho

Work performed under DOE Contract No. DE-AC07-76ID01570

ENVIRONMENTAL AUDIT
OF THE
HIGH PLAINS GRASSLANDS RESEARCH STATION

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE - NORTHERN PLAINS AREA

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Approved: Larry D. Croft Date: 12/15/88

L. D. Croft, Program Coordinator
Environmental Program Management Group
EG&G Idaho, Inc.

Approved: G. R. Archibald Date: 12/15/88

G. R. Archibald
Project Manager
Idaho Operations Office
U. S. Department of Energy

EPMG-8346

ENVIRONMENTAL AUDIT
OF THE
HIGH PLAINS GRASSLANDS RESEARCH STATION
CHEYENNE, WYOMING

December 1988

Prepared by
EG&G Idaho, Inc
Idaho National Engineering Laboratory (INEL)
Idaho Falls, Idaho 83415

for the
Agricultural Research Service
U. S. Department of Agriculture

Through the
Department of Energy
Idaho Operations Office
Idaho Falls, Idaho 83402
Under Contract No. DE-AC07-77-76ID01570

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1.0 EXECUTIVE SUMMARY

An environmental audit of the High Plains Grasslands Research Station (hereafter referred to as the Station) was conducted November 15 through 17, 1988 by personnel from the Idaho National Engineering Laboratory, through Interagency Agreement with the U. S. Department of Agriculture. The audit assessed compliance with regulations promulgated under seven major environmental statutes, and entailed discussions with Station personnel, a facility inspection/site visit, and records review.

No Station activities were identified as posing an immediate threat to public health and safety. However, two major compliance issues were identified during the audit: 1) the accumulation of a wide variety of unwanted/excess chemical items that would classify as hazardous waste and 2) the discharge of non-sanitary wastes (including hazardous wastes) to the Station septic system. The first of these issues may result in an unavoidable (but temporary) loss of the Station's Conditionally Exempt Small Quantity Generator status under the Resource Conservation and Recovery Act (RCRA) and the second may result in groundwater degradation from prohibited discharges in violation of State water quality regulations. Other miscellaneous areas of regulatory non-compliance (or potential non-compliance depending upon State agency interpretation) relate primarily to permitting violations under the Clean Air Act (CAA) and Clean Water Act (CWA).

Based on these findings, it is strongly recommended that the Station 1) inventory and remove all unwanted/unnecessary chemical items (utilizing a permitted waste treatment/disposal contractor for items classified as RCRA hazardous waste), and 2) characterize the septic system as a potential source of groundwater contamination, while eliminating hazardous discharges to the system. Notification of the State Department of Environmental Quality

with respect to the septic system use, permitting, and planned investigations, and permitting of other air and water discharges is recommended to ensure that future compliance activities are consistent with State policies and interpretations.

2.0 INTRODUCTION

2.1. Purpose and Scope

A multi-media environmental compliance audit of the Agricultural Research Service (ARS), High Plains Grasslands Research Station, Cheyenne, WY, was conducted November 15 through 17, 1988. The audit was conducted to 1) determine the scope of activities at the Station; 2) assess compliance with Federal, State, and local environmental regulations impacting these activities; and 3) provide recommendations, as appropriate, to ensure ongoing compliance.

The audit assessed compliance with regulations promulgated under the following statutes:

- Resource Conservation and Recovery Act (RCRA)
- Comprehensive Environmental Response, Compensation, and Liability Act/Superfund Amendments and Reauthorization Act (CERCLA/SARA)
- Clean Air Act (CAA)
- Clean Water Act (CWA)
- Toxic Substances Control Act (TSCA)
- Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA)
- Safe Drinking Water Act (SDWA)

The audit did not encompass safety/industrial hygiene issues, except as covered in one of the above statutes. Potential safety concerns were, however, identified and discussed with Station personnel on an informal basis. These issues will also be identified to the Area Safety Officer (E. M. Affa) under a separate letter.

The audit was conducted by personnel from the Idaho National Engineering laboratory (INEL), through Interagency Agreement with the Department of Agriculture, and accompanied by Mr. Ernest M. Affa, ARS Northern Plains Area Safety Manager (see Attachment 1 for listing of audit team members). Information to support the audit was obtained through discussions with Station personnel, through a review of Station environmental records and reports, and through visits to Station facilities. No analytical testing was conducted during the audit.

2.2. History and Site Description

Department of Agriculture activities at the site were initiated in 1928, with emphasis on conducting research on cereal crop and livestock problems of the Central Great Plains region. In 1930, these research activities were reduced, and the facility became the Cheyenne Horticultural Field Station, conducting research on shelterbelts and windbreaks, forage crops, fruit trees and flowers. Horticulture research was terminated in 1974, and the facility was renamed the High Plains Grasslands Research Station to reflect a new mission of conducting land reclamation, livestock management and grazing research. Cooperative research in these areas is ongoing with the University of Wyoming Agricultural Experiment Station.

The Station occupies 2,869 acres, of which 2,139 acres are leased from the City of Cheyenne. The Station currently has 16 employees, with additional personnel present during the summer (including graduate/undergraduate students). Major on-site facilities, all located on or adjacent to Hildreth Road, are the residences (5) for Station employees, a greenhouse, office (with downstairs laboratory), laboratory, shops (vehicle maintenance and carpentry), and root cellar (miscellaneous storage). The vast majority of acreage consists, however, of cultivated and uncultivated lands that support the research mission of the Station, or that reflect past research activities (i.e., shelterbreaks; arboretum). Figure 1 presents a layout of the Station facilities.

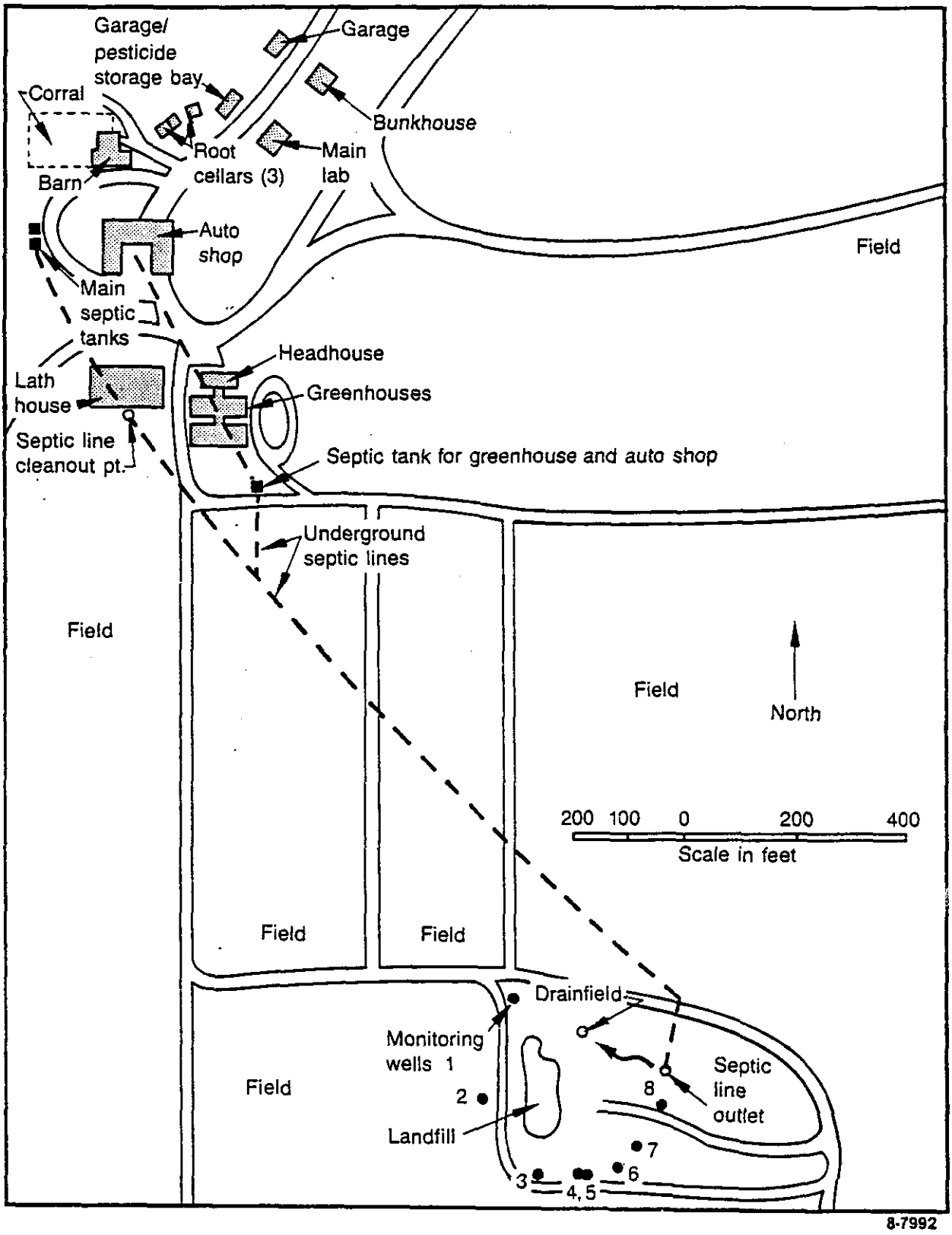

Figure 1. High Plains Grasslands Research Station Site Layout.

Section 3 of the report presents audit findings that summarize 1) the types of activities/operations under each compliance discipline; 2) regulatory requirements that impact these activities; and 3) findings related to these requirements. Recommendations in Section 4 are keyed to these findings.

3.0 FINDINGS

A major portion of the on-site survey was spent touring shops and other facilities that could impact environmental compliance. Results of these walk-throughs, together with information obtained through discussion with Station personnel and review of background documents/chemical inventories are presented separately under each major environmental compliance area.

3.1. Safe Drinking Water Act (SDWA)

3.1.1. Drinking Water

Potable water at the Station is supplied by the City of Cheyenne, with no subsequent treatment conducted by the Station. As such, the Station is exempt from sampling and analysis requirements under 40 CFR 141 and 143 for primary and secondary drinking water contaminants, respectively.

No voluntary analysis of drinking water on the Station has been conducted, except for efforts associated with ensuring the integrity of distilled water in laboratory analyses. Recommendations in Section 4 are directed towards some voluntary sampling and analysis efforts, in part because of the presence of residents with children at the Station.

3.1.2. Underground Injection

The SDWA provides for an Underground Injection Control (UIC) program, that specifically includes septic tanks and leach fields within the definition of an injection well. The State of Wyoming was authorized by EPA, effective July 15, 1983, to implement its own UIC program, with regulations specified in Wyoming Department of Environmental Quality (DEQ), Water Quality Rules and Regulations, Chapters VIII and IX.

Wastewaters at the Station are managed in a septic tank/leach field system, the latter consisting of a 1/2 - 3/4 mile clay tile line that discharges at an area approximately 150 feet Northeast of the Station landfill. It is believed that the tile segments are spaced to allow seepage/drainage along the line. This system collects sanitary wastes from buildings and residences, laboratory wastes, and floor drain washdowns from throughout the Station. Average monthly discharges (based on water consumption records) are estimated at 46,000 gallons.

Laboratory discharges include RCRA hazardous wastes (heavy metals primarily, see Section 3.4 and Attachment 2), and non-hazardous, non-sanitary wastes representing a potential wide variety (and generally small quantities) of chemical reagents in the laboratory inventory. Floor drain discharges are expected to be comprised of general detergent solutions and rinses from occasional cleaning activities. The major exception occurs at the vehicle shop, where floor drain discharges represent a potentially significant and definite source of petroleum hydrocarbons to the septic system.

Wyoming groundwater pollution control permits (DEQ Water Quality Rules and Regulations, Chapter IX) are required for all subsurface discharges of commercial, municipal or industrial waste, and include toxic or hazardous waste from any source. Informal discussions with the Wyoming DEQ, Water Quality Division indicate that laboratory discharges, and floor-drain wastes from service stations (i.e., vehicle maintenance) would definitely classify as industrial discharges subject to Chapter IX requirements. These requirements (Chapter IX, Section 5) include permitting within one year of the effective date of the rule (effective date September 1980), for existing sources not specifically exempted under Section 4. These latter exemptions did not include industrial discharges.

Additionally, informal discussions with the Wyoming Water Quality Division, Groundwater Quality, indicate that the State is actively attempting to identify and control septic systems that may impact the groundwater quality of the State through voluntary requests or enforcement actions issued to owners/operators for effluent monitoring, sampling and analysis, and remedial action if necessary.

The septic system has been identified to EPA as a potential CERCLA site, in the CERCLA 103(c) notification (dated December 18, 1987) and in the 1988 Inventory of Federal Hazardous Waste Activities. These submittals will establish the Station on the Federal Agency Hazardous Waste Compliance Docket, requiring a Preliminary Assessment of the system within 18 months of inclusion in the docket. As discussed further under Recommendations, several related issues will likely impact continued use and (allowable discharges) to the system.

3.2. Clean Air Act (CAA)

3.2.1. Air Contaminant Emission Sources

The State of Wyoming Air Quality Standards and Regulations (Wyoming DEQ Rules and Regulations, Air Quality Division, Chapter 1, Section 21) require permits for construction of new sources of air contaminants (generally sources constructed after 1970) with some limited exemptions and waivers (see Attachment 3).

The majority of air emission sources at the Station were either constructed prior to 1970, or are otherwise exempt (Table 1 presents an inventory of Station emission sources). However, two sources in the vehicle shop are in operation without having received either permits to construct or administrative waivers: the welding exhaust vent, and the ventilation hood over the battery charging area (installed approximately 1980 and 1987, respectively).

3.2.2. Asbestos

EPA regulates the renovation/demolition of facilities that contain friable asbestos, and disposal of asbestos-containing wastes, under National Emission Standards for Hazardous Air Pollutants (NESHAPS) regulations (40 CFR 61, Subpart M). Although no asbestos renovation/demolition activities have been conducted at the Station (at least since the effective date of these regulations, April 1984), a

TABLE 1. STATIONARY AIR CONTAMINANT EMISSION SOURCE INVENTORY [a]

Location	Source	Permit Status
Office	Laboratory Hood	Laboratory Equipment Exemption[b]
Greenhouse	Headhouse Grinder	Exempt-Construction Prior to 1970
Shop	Welding Hood Vent	Potential Unpermitted Source[c]
	Battery Charger Hood Vent	Potential Unpermitted Source[c]
Laboratory	Laboratory Hood (1st Floor)	Laboratory Equipment Exemption[b]
	Soil Preparation Room Vent	Laboratory Equipment Exemption[b]
	Perchlorate Hoods (2)	Laboratory Equipment Exemption[b]
	AA Hood/Vent	Laboratory Equipment Exemption[b]
	Ashing Oven Hood Vent	Laboratory Equipment Exemption[b]

a. Excludes fuel burning equipment; all such equipment is less than 10 million BTU/hr and excluded from permitting under Section 21 of the Wyoming Air Rules.

b. Exempt per Section 21(k) of the Wyoming Air Rules.

c May be subject to administrative waiver as an insignificant source (see discussion in Recommendations section).

potential exists for some renovation work to be conducted, based on the findings of exposed friable asbestos at three locations in the greenhouse: furnace/boiler pipes, the autoclave, and a countertop.[a] Samples of the autoclave asbestos had been previously taken, but apparently not analyzed.

Recommendations in Section 4 are therefore primarily directed towards ensuring that appropriate NESHAPS requirements (including EPA notifications) are met with respect to any future asbestos-related renovations.

3.3. Clean Water Act (CWA)

3.3.1. Oil Pollution Prevention

Regulations for the prevention of oil pollution from on-shore facilities are established under the CWA in 40 CFR Part 112, Oil Pollution Prevention. These regulations mandate procedures, methods, and equipment necessary to prevent oil pollution at facilities that store greater than 42,000 gallons of oil underground, or greater than 1,320 gallons of oil above ground (or store greater than 660 gallons in any single above ground container).

Oil storage at the Station is accomplished in small (< 1,000 gallons) underground storage tanks, two above ground diesel fuel storage tanks of 300 gallon-capacity (each), and two 55-gallon containers (above ground) for waste oil. With exception of the waste oil containers, secondary containment is not provided for any tank, and a Spill Prevention, Control and Countermeasures Plan (SPCC) has not been prepared. Although the Station is exempt from these requirements of 40 CFR 112 (based on its storage volumes), recommendations in Section 4 are nevertheless provided to minimize the potential for oil discharges at the Station.

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a. A detailed asbestos inventory was not conducted during the audit: these friable asbestos sources were obvious sources noted during the walk-throughs.

3.3.2. National Pollution Discharge Elimination System (NPDES)

Point-source discharges of pollutants into waters of the State of Wyoming are regulated by Wyoming NPDES Permit Program Regulations (Wyoming DEQ Rules and Regulations, Chapter II), pursuant to the Clean Water Act. This permitting program has an especially broad scope, because of the inclusive definitions of "pollutant" (includes sand and soil) and "waters of the United States", the latter defined to specifically include, for example wet meadows, playa lakes and sloughs.

One potential point source was identified at the Station. This source is a greenhouse root/pot washer drain that was recently (1987) rerouted to discharge to a storm water drainage ditch. This ditch, although, normally dry, leads to a shallow impoundment formerly used to store irrigation waters (and now evident as a low area with cattails). Discharges from the root/pot washer consist solely of water and suspended solids (soil), and are considered to have no adverse environmental effort. Nevertheless, NPDES jurisdiction of this discharge is possible, and likely dependent upon State regulatory agency interpretation and policy (see Section 4, Recommendations).

3.4. Resource Conservation and Recovery Act (RCRA)

RCRA is the major Federal program for the regulation of hazardous wastes, waste oils, and underground storage tanks containing hazardous substances. Because the State of Wyoming is not yet authorized to manage its own program under RCRA, the Federal RCRA regulations (and exemptions) are applicable to Station activities. Findings relevant to the Station's RCRA activities are presented below.

3.4.1. Hazardous Waste Generation

RCRA hazardous waste regulations establish two groups of waste generators. Conditionally Exempt Small Quantity Generators (CESQGs) generate and store less than 1 kilogram (kg) acute hazardous waste per month ("P" wastes, listed in 40 CFR 261.32), and generate less than 100 kg of other hazardous waste per month. These generators are substantially exempt from RCRA requirements, but wastes must be managed (treated/disposed) at a RCRA-permitted facility, or at a facility licensed by a State to manage municipal/industrial waste (i.e., State licensed municipal landfills, if the landfill accepts such waste). All other generators of hazardous waste must comply with all RCRA requirements for waste accumulation, storage, treatment, and disposal.

Two major categories of hazardous wastes are generated or potentially generated at the Station: wastes from laboratory research activities that are presently discharged with wastewaters to the septic system, and unwanted/unusable chemicals (pesticides, paints, reagents, etc.) presently in storage. Based upon the quantities of hazardous waste generated from on-going laboratory activities, the Station would classify as a CESQG. However, as discussed below, the presence of unwanted/unusable chemical items at the Station could negate this status.

3.4.1.1. Laboratory Discharges. As described in Section 3.1, discharges to the septic system can be classified as either RCRA hazardous wastes, sanitary wastes, or non-hazardous/non-sanitary wastes. Table 2 summarizes potential hazardous waste discharges to the septic system, as identified during discussions with laboratory personnel, and through review of chemical reagents in storage. The major volume of this waste consists of solutions that contain heavy metals in excess of allowable RCRA concentrations (see Attachment 2 for RCRA limits). Although mercury and chromium-containing solutions represented the largest volume of the

TABLE 2. LABORATORY HAZARDOUS WASTE DISCHARGES TO SEPTIC SYSTEM

Waste Stream	Estimated Annual Volume	EPA Hazardous Waste No.
Miscellaneous bases[a]	20 liters	D002
Phenyl mercuric acetate in KCl	300 liters	D009
Aqueous solutions of dichromate/phosphoric acid	250 liters	D007
Miscellaneous heavy metal solutions (arsenic, barium, selenium, silver)	unknown[b]	D004, D005, D010, D011
Spent solvents	unknown[c]	F001-F005

a. Acid discharges (estimated 200 liters/year) should be neutralized in the laboratory limestone-filled tank to above a pH of 2.5, and therefore no longer classify as a hazardous waste. The limestone is not expected to effectively mediate the pH of strong bases.

b. The presence of silver nitrate, silver sulfate, barium chloride, selenium dioxide, and arsenic trioxide in the laboratory chemical inventory indicates a potential for waste streams containing these substances to be generated and discharged. Potential quantities are small but unknown.

c. See discussion in text.

waste (estimated at 300 liters and 250 liters/month, respectively)[a], a review of chemical reagents in storage indicated a potential for other heavy metals to be used, and presumably discharged in excess of EP toxic limits (specifically lead, barium, and silver).

Acid (estimated 200 liters/month) and basic (estimated 20 liters/month) wastes are also generated from laboratory activities, and if discharged without treatment could classify as RCRA wastes due to the characteristic of corrosivity ($2 \geq pH \geq 12.5$). All central laboratory wastewaters are discharged through a neutralization tank (160 gallon capacity, filled with limestone chips), and this, together with wastewater dilution, should eliminate the characteristic of corrosivity from acid discharges, but is not expected to effectively treat basic wastes.

The discharge of spent solvents represents another type of potential RCRA hazardous waste discharge. These wastes (EPA Hazardous Waste Nos. F001-F005) are specific halogenated and non-halogenated chemicals that have been used for their solvent properties (as opposed, for example, to use as reactants in a chemical synthesis). Chemicals in the laboratory inventory that could result in such waste include acetone, toluene, xylene, and methanol.[b]

The potential for generation of spent solvent wastes is not restricted to laboratory activities, but could result from activities such as cleaning, paint thinning/stripping, or degreasing. As discussed in the following subsection a large variety of miscellaneous chemicals, including chemicals that would classify as spent solvents wastes if used and disposed, are presently stored at the Station.

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a. Estimates of total annual quantities are made with the recognition that discharge can be highly variable, depending upon research activities and specific analyses being conducted.

b. Ignitable spent solvents (F003 wastes, including acetone, methanol, and xylene) that are mixed with wastewater and therefore no longer meet the definition of ignitable (flashpoint $\leq$ 140 F) would no longer classify as hazardous waste [40 CFR 261.3(a)(2)(iii)].

Finally, recent analytical data showed chromium and mercury concentrations (7.3 and 0.26 mg/kg, respectively) in septic tank sludge/liquid to be in excess of RCRA limits. This indicates that the septic tanks may represent a future source (and potential large volume) of hazardous waste, when pumped for repair or maintenance activities. Future controls over heavy metal discharge should reduce these concentrations, but analysis of this waste before off-site disposal should nevertheless be conducted.

3.4.1.2. Excess/Unwanted Materials in Storage. Discussions with Station personnel and observation during the site visit confirmed that a wide variety and potentially large quantity of materials in storage are excess, unwanted, or shelf-life items, which upon designation as waste would likely meet a hazardous criteria under RCRA. Such materials are primarily pesticides, paints, and thinners/solvents, with the largest quantities stored at the greenhouse, pesticide storage bay, and root cellar, and smaller quantities stored at several other locations on the Station (laboratories, shops). Table 3 provides a representative listing of these items (exclusive of pesticides, see Tables 4 and 5), together with the EPA Hazardous Waste No. designation, and storage location. This table is not intended as a detailed inventory, but rather provides a preliminary listing of the types of items potentially requiring disposal as RCRA hazardous wastes.

Although the Station has not designated these materials as waste, a regulatory interpretation would likely be made that these materials are waste under RCRA, because they are being accumulated or stored in lieu of disposal (40 CFR 261.2, Definition of Solid Waste). Such an interpretation would immediately establish the Station as a large-quantity generator of hazardous waste, no longer subject to the exemption from RCRA requirements provided to CESQGs. The loss of the CESQG-status would result from the relatively large quantities of "P" (acute hazardous) wastes contributed by the excess pesticides (see Table 4) that substantially exceed the 1 kg generation and storage limit; additionally, and subject to a final inventory, the Station could exceed the 1000 kg hazardous waste (i.e., other than acute hazardous) storage limit. For

TABLE 3. REPRESENTATIVE UNUSED/EXCESS ITEMS POTENTIALLY REQUIRING DISPOSAL[a]

	EPA Hazardous Waste No(s).
Greenhouse(Basement)	
Nitropropane/toluene	D001
Toluene	U220
Penta Wood Preservative	F027
Chrome Yellow Paint (NSN 8010-527-3193)	D007; D001[b]
Red Lead Paint	D008; D001
White Lead Paint	D008; D001
Zinc Chromate Primer	D007; D001
Varnish (NSN 8010-165-5852)	D001
Interior Varnish (NSN 8010-165-4424)	D001
Dow Sealant (ingredients unknown)	--
Adhesive (flammable)	D001
Root Cellar	
Acetone	U002
Methanol	U154
Ethanol	D001
Butyl Alcohol	U031
Cleaning Solvent (ingredients unknown)	--

a. Excludes pesticides; see Tables 4 and 5.

b. D001 designation indicates probable flash point $\leq 140^{o}$ F.

these reasons, and again subject to the above interpretation, the Station could be found in present violation of RCRA requirements for hazardous waste generator notifications (40 CFR 262.12), accumulation (40 CFR 262.34), and storage (40 CFR 264 Subpart I).

Because of these potential implications, recommendations as detailed in Section 4, are directed towards ensuring that the Station establish a timely schedule for evaluating its chemical/material inventory. Concurrently the Station should initiate procurement/funding requests to obtain the services of a commercial waste management firm for those unwanted/excess materials which cannot otherwise be donated/reused by other parties, and which require disposal as RCRA hazardous waste. While the outcome of this process may result in the loss of the CESQG-status for one or more months, it nevertheless will provide an orderly means for the Station to conduct these activities in compliance with RCRA.

3.4.2. Hazardous Waste Storage

Non-hazardous and potential (presently uncharacterized) hazardous wastes are stored behind the vehicle shop, adjacent to the waste oil drums. Potential hazardous waste includes one container labelled as originally containing 2,4-D but suspected of containing waste oil, and a partially full (estimated one-quarter) 55-gallon drum suspected of containing paint/thinners. Non-hazardous wastes include containers of silica gel, grease, an adhesive floor compound, and foaming agent (Stock No. 4210-223-9877) together with empty 5-gallon pails and 55-gallon drums. The Material Safety Data Sheet for the foam agent (Mfg. Lorcon, Inc.) shows that the item contains <10% hexylene glycol, and is not regulated for transportation. Based on this information, the material should not be classified as a hazardous waste (unless contaminated by heavy metals or solvents).

The above wastes were moved to the present storage location from the Station landfill, at the time of the latter's closure. No attempt has been made to segregate hazardous (potentially) from non-hazardous wastes and empty containers, and in some cases (floor adhesive and foaming agent) the containers are of poor integrity.

3.4.3. Waste Oil

The Station generates an estimated 20 gal/mo of waste oil from vehicle maintenance at the shop. This waste is accumulated in two 55-gallon drums (labelled as to actual contents) that are stored outside over a concrete sump. Drums are emptied approximately 2-3 times per year by Tri-State Oil Recyclers (Cheyenne, WY).

Tri-State markets specification and off-specification (high heavy metals, low flash point, and high total halogens; see 40 CFR 266.40) used oil to used oil burners and other marketers, but does not burn used oil itself. The Station, because it does not sell used oil directly to a burner, is not defined as a marketer and therefore is exempt from EPA notification and other requirements of 40 CFR 266 Subpart E. Discussions with Tri-State indicate that the firm has notified EPA of its marketing activities, has received an EPA identification number, and conducts analysis of bulked oil for specification/off-specification determinations. Individual waste oil collections are not analyzed unless the firm has reason to suspect a contamination problem (hazardous waste or PCBs).

3.4.4. Underground Storage Tanks (USTs)

The Station has nine active and one inactive underground storage tanks (USTs), that have been identified to the State of Wyoming (the 1986 notification included one tank subsequently removed). Seven of the active tanks are exempt from regulation because they store heating oil for consumptive use on the premise where stored. Other USTs (not identified in the notification) exist at the Station, but are also exempt from

regulation (and notification). These are the sump located in the vehicle shop for collection of floor rinses (exempt under 40 CFR 280.10(b)(5) as containing de minimis concentrations of regulated substances), the waste oil containment sump (exempt under 40 CFR 280.10(b)(6) as an emergency spill or overflow system, expeditiously emptied after use), and septic tanks (exempt under 40 CFR 280.1).

The two regulated USTs are located at the vehicle shop entrance, and are dedicated for storage of leaded and unleaded gasoline for Station vehicles. Each tank is of steel construction and 560 gallon capacity, and an estimated age in excess of 30 years. Tank inventories are kept using a measured dip-stick, and records are reconciled monthly against metered usage, purchase records, and fuel dispensement logs.

3.5. CERCLA/SARA

3.5.1. EPA Notifications

A CERCLA 103(c) notification has been submitted (December, 1987) to EPA that identified the Station septic system as a potential hazardous waste site. The septic system was also identified to EPA as a RCRA/CERCLA unit (two underground injection units were identified) in the 1988 Inventory of Federal Hazardous Waste Activities (RCRA 3016 reporting requirement). These notifications will place the Station on the Federal Agency Hazardous Waste Compliance Docket.

3.5.2. SARA Title III

SARA Title III is the Emergency Planning and Community Right-to-Know Act of 1986 that established extensive reporting and inventory requirements for certain hazardous chemicals. Although Federal facilities are exempt from SARA, EPA has indicated that Federal facilities have agreed to comply with Title III requirements.

A review of the Station's chemical inventory against the SARA list of 366 extremely hazardous substances showed that no items were present in excess of Threshold Planning Quantities (TPQ), and as such the Station was exempt from notification of the State Emergency Planning Commission. However, as discussed under Recommendations, recent expansion of reporting requirements to non-manufacturing facilities may entail (still voluntary for Federal facilities) some limited reporting of other hazardous substances (i. e.,, hazardous substances that do not classify as extremely hazardous, but which are present in excess of 10,000 lbs).

3.6. Toxic Substance Control Act (TSCA)

The Toxic Substances Control Act (TSCA) was enacted in 1976, to protect human health and the environment from unreasonable risks of injury caused by the manufacture, processing, distribution, use, or disposal of chemical substances and mixtures. The controlled substances most likely to impact Station operations under TSCA are polychlorinated biphenyls (PCBs), which are addressed in 40 CFR Part 761. These regulations provide definitions and requirements for the use, storage, and disposal of PCBs and PCB-items.

No PCB-contaminated items or wastes are currently generated or handled by Agricultural Research Service (ARS) personnel. All transformers at the Station are owned, maintained, and serviced by the Cheyenne Light, Fuel, and Power Company. Interviews with employees confirm that very few transformers are located on the property, and most of those present have been replaced by the utility within the last 2-5 years. These recently installed transformers are not expected to utilize PCB-containing dielectric fluids (inspection of one new transformer showed no PCB labels or markings).

The possibility of other PCB-containing systems or applications existing at the Station was discussed with appropriate personnel. To the best of their knowledge, no capacitors, heat transfer systems, hydraulic systems, electromagnets, switches, etc., are located on-site that utilize

PCB-contaminated fluids. The absence of PCB-items at the Station was also verified during the facility walk-throughs. Microscopy mounting medium and microscopy immersion oils used in the small laboratory in the basement of the office building were also found to be PCB-free.

No other activities controlled under TSCA were identified.

3.7. Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA)

The Federal regulations that are applicable to the use of pesticides are contained in 40 CFR Parts 160 to 180, as promulgated pursuant to the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), originally enacted in 1947. FIFRA regulates the manufacture, sale, and use of pesticides, and requires that all pesticide products sold or distributed in the U.S. be registered with EPA. Furthermore, use of any registered pesticide in a manner inconsistent with labelling instructions is prohibited. Since 1977, all pesticides have been classified for either general or restricted use. Restricted pesticides are usually highly toxic and are determined to generally cause unreasonable adverse environmental effects, and they may be used only by, or under the direct supervision of, a certified applicator.

The FIFRA regulatory requirements and recommendations are directly applicable to operations at the Station because of the use of pesticides during the normal course of the agricultural research activities and general pest control around the Station. Regulations pertinent to Station pesticide practices include:

- 40 CFR 162 to 164 - Regulations governing pesticide registration, reregistration, classification procedures, definitions, and labelling requirements.
- 40 CFR 165 - Final regulations governing disposal, storage, and overall management of pesticides and pesticide wastes.
- 40 CFR 171 - Regulations governing pesticide applicator certification.

Pesticides are used at the Station, both indoors, within the greenhouse complex, and outdoors. Two State certified (by Wyoming Agriculture Department every 3 years) applicators are employed at the Station. Discussions with both pesticide applicators and the Station's Research Leader provided information on current pesticide application practices and storage inventories. Tables 4 and 5 are recent Station inventories of pesticides stored in the greenhouse headhouse cabinets and basement, and the pesticide storage bay, respectively (Note: strychnine kept in barn was added to the original Table 5).

The pesticide inventory tables have been modified for this audit report to include EPA hazardous waste numbers based upon preliminary comparison of trade names and active ingredients against the categories of RCRA-listed wastes. Other pesticides may also classify as hazardous wastes based on the characteristics of ignitability, corrosivity, or reactivity, but information was generally not available to make these determinations. The majority of pesticides shown in the tables without a hazardous waste designation are still very highly toxic even though they are not RCRA "listed" wastes. Also, the current inventories include restricted-use pesticides as well as pesticides that have had their registrations cancelled. Among pesticides listed in Tables 4 and 5, the following are classified by EPA as restricted-use pesticides in 40 CFR 162.31: chloropecrin, ethyl parathion, nicotine (alkaloid), picloram, and strychnine.

Cancelled/suspended pesticides are listed in the booklet, "Suspended, Cancelled, and Restricted Pesticides," (U.S. EPA, January 1985).[a] The following Station pesticides are included in the referenced EPA report: chlordane, chlorobenzilate, DDT, 2,4-D, lindane, metaldehyde, parathion, strychnine, toxaphene, trifluralin, and ethylene bisdithiocarbamates. As such these pesticides may be banned or restricted from their original intended use.

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a. "Restricted" pesticides are those whose use has been limited or restricted since an initial registration approval, and therefore require a label change.

TABLE 4. STATION GREENHOUSE PESTICIDE INVENTORY AS OF NOVEMBER 1986

Pesticide	Active Ingredient	Quantity	EPA[a] HW No.
Arasan	Tetramethylthiuram disulfide	2 lb	(D003)[c]
Arsenate of Lead	Lead arsenate	2 lb	D004, D008
Blackleaf 40	Nicotine sulfate (expressed as alkaloid)	17 oz	P075
Botran, 75% wp	2,6-Dichloro-4-nitroaniline	4 lb	
Botran, 50% wp	2,6-Dichloro-4-nitroaniline	5 lb	
Calcium Chloride (liquid)	Calcium chloride	1/4 lb	
Captan[b] (7.5% dust)	n-Trichloromethylmercapto-4-cyclohexene-1,2-dicarboximide	18 lb	
Ceresan	Ethylmercury phosphate	9 lb	D009
Ceresan-m	Ethylmercury-p-toluene sulfonanilide	1/2 lb	D009
Chlordane	Octachloro-4,7-methano-tetrahydroindane	31 gal	U036
Chlordane 45 (liquid)	Octachloro-4,7-methano-tetrahydroindane	5 gal	U036
Chlorobenzilate 25W	Ethyl-4,4'-dichlorobenzilate	1 lb	U038
Chlorobenzilate 4E	Ethyl-4,4'-dichlorobenzilate	1 gal	U038
DDT	4,4'-Dichlorodiphenyltrichloro-ethane	10 gal	U061
Diazinon AG 500	o,o-Diethyl-o(2-isopropyl-4-methyl-6-pyrimidyl)phosphorothioate (Diazide)	1 qt	
Diazinon 50W	o,o-Diethyl-o(2-isopropyl-4-methyl-6-pyrimidyl)phosphorothioate	1/2 lb	
Diazinon 25E[b]	o,o-Diethyl-o(2-isopropyl-4-methyl-6-pyrimidyl)phosphorothioate and xylene	1 pt	U239

TABLE 4. (continued)

Pesticide	Active Ingredient	Quantity	EPA[a] HW No.
Dibrone-8-Emulsive	Dimethyl-1,2-dibromo-2,2-dichloroethyl phosphate and xylene	1 gal	U239
Dritomic Sulfur	Sulfur	6 lb	
Dusting Gypsum	Gypsum	1 lb	
Eptam 6-E	Ethyl-n,n-di-n-propylthiocarbamate	Unknown	
Ferrous Sulfate (liquid)	Ferrous sulfate	1 lb	
Flotox	Sulfur	1 lb	
House and Garden Insect Killer	Allethrin, n-octylbicycloheptene dicarboximide, DDT, isobornyl thiocyane acetate, other terpenes, methoxychlor, and petroleum distillate	1/2 lb	U061, U247
Kelthane W	1,1-Bis(p-chlorophenyl)-2,2,2-trichloroethanol	2 lb	
Larvicide 100	Chloropicrin (Trichloronitro-methane)	2 lb	
Malathion (liquid)[b]	o,o-Dimethyl dithiophosphate of diethyl mercaptosuccinate	1.25 lb	
Malathion, 25% wp	o,o-Dimethyl dithiophosphate of diethyl mercaptosuccinate	5 lb	
Malathion, 57% EC	o,o-Dimethyl dithiophosphate of diethyl mercaptosuccinate	15 gal	
Malathion-50[b]	o,o-Dimethyl dithiophosphate of diethyl mercaptosuccinate and xylene	1 qt	U239
Malathion-lindane	o,o-Dimethyl dithiophosphate of diethyl mercaptosuccinate, benzene hexachloride, petroleum distillate, and low phytotoxic fogging oil	1 gal	U129
Manzate	Manganese ethylene bis-dithio-carbamate	20 lb	U114

TABLE 4. (continued)

Pesticide	Active Ingredient	Quantity	EPA[a] HW No.
Nicotine	Nicotine (alkaloid)	12 oz	P075
Nu-Iron	Iron (metallic)	1/2 lb	
Parathion	o,o-Diethyl-o,p-nitrophenyl phosphorothioate	6.6 oz	P089
Parzate	Zinc ethylene bis-dithiocarbamate	1 lb	U114
Pentac Miticide[b]	Bis-pentachloro-2,4-cyclopentadien-1-yl	2.5 lb	
Pentac Fogging Miticide	Bis-pentachloro-2,4-cyclopentadien-1-yl, petroleum distillate, and low phytotoxic fogging oil	1 gal	
Plant Fume 103	Tetraethyldithiopyrophosphate	14 oz	P109
Potassium Nitrate	Potassium nitrate	1 lb	
Rat and Mouse Bait	3-(Alpha-acetonylfurfuryl)-4-hydroxycoumarin (Warfarin)	1 lb	P001
Rose Food (liquid)	Nitrogen, phosphoric acid, potash, iron, zinc, and sodium ethylene diaminetetraacetate	1 pt	
Rotenone	Rotenone	1 oz	
Roundup[b]	n-(Phosphonomethyl)glycine	1 gal	
Semesan	Hydroxymercurichlorophenol	4 lb	D009
Sevin-4-flowable[b]	Carbaryl (1-naphthyl-n-methyl carbamate)	4 gal	
Sevin, 5% Dust	Carbaryl	6 lb	
Sevin-50W	Carbaryl	7 lb	
Snail and Slug Pellets	Metaldehyde (m-acetaldehyde)	2.5 lb	U001
Sodium Pentachlorophenate	Sodium pentachlorophenate	25 lb	F027

TABLE 4. (continued)

Pesticide	Active Ingredient	Quantity	EPA[a] HW No.
Synthetic Pyrethroid SBP 1382 Resmethrin	5-Benzyl-3-furyl methyl 2-dimethyl-3-2-methylpropenyl cyclopropane carboxylate	10 lb	
Tedion, dithio	2,4,5,4-Tetrachlorodiphenyl sulfate and tetraethyl dithiopyrophosphate	13 lb	P109
Tedion-1-miscible	2,4,5,4-Tetrachlorodiphenyl sulfate	1 qt	
Tedion-3-dust	2,4,5,4-Tetrachlorodiphenyl sulfate	3 lb	
Tedion-25[b]	2,4,5,4-Tetrachlorodiphenyl sulfate	8 lb	
Thiram	Tetramethylthiuram disulfide	6 lb	U244
Toxaphene Spray	Toxaphene and petroleum distillate	1 qt	P123
Treflan	2,6-Dinitro-n,n-dipropyl-4-(trifluoromethyl)benzenamine [Trifluralin]	1 qt	
Vapam 4-S	Sodium n-methyl dithiocarbamate	1 gal	
Vapona (greenhouse fogging insecticide)	2,2-Dichlorovinyl dimethyl phosphate, related compounds, petroleum distillate, and low phytotoxic fogging oil	2 gal	

a. EPA hazardous waste number based on preliminary comparison of trade names and active ingredients against the categories of RCRA listed wastes. Other pesticides may also classify as hazardous wastes based on the characteristics of ignitability, corrosivity, or reactivity, but information was not generally available to make these determinations (see 40 CFR 261 Subparts C and D).

b. Discussions with Station personnel indicate that these pesticides are still being used. Other pesticides on this list are considered excess/unwanted or outdated and are therefore no longer used at the Station.

c. Potential reactive waste based on sulfide content: see 40 CFR 261.23.

TABLE 5. STATION STORAGE BAY PESTICIDE INVENTORY AS OF APRIL 1988

Pesticide	Active Ingredient	Quantity	EPA[a] HW No.
Banvel[b]	3,6-Dichloro-o-anisic acid	5 gal	
Carbaryl[b]	1-Naphthyl-n-methylcarbamate	Unknown	
Casaron[b]	Dichlorobenil (2,6-dichlorobenzo-nitrile)	150 lb	
2,4-D[b]	2,4-Dichlorophenoxyacetic acid	15 gal	U240
2,4,-DB[b]	4-(2,4-Dichlorophenoxy)-butyric acid	30 gal	
Fenac	2,3,6-Trichlorophenylacetic acid 2,3,6-Trichlorophenylacetic acid	20 gal 200 lb	F027 F027
Micro-fume	Tetrahydro-3,5-dimethyl-2H-thiadiazine-2-thione	150 lb	
Malathion	o,o-Dimethyl dithiophosphate of diethyl mercaptosuccinate	100 lb	
Orthene[b]	o,s-Dimethylacetylphosphoroamido-thioate (Acephate)	15 lb	
Princep	2-Chloro-4,6-bis(ethylamine)-s-triazine	45 gal	
Roundup[b]	n-(Phosphonomethyl)glycine	2 gal	
Strychnine[b]	Strychnine [**Located in barn**]	Unknown	P108
Tordon 2K[b]	Picloram (4-Amino-3,5,6-trichloro-picolinic acid)	40 lb	
Tordon 22K[b]	Picloram (4-Amino-3,5,6-trichloro-picolinic acid)	10 gal	

a. EPA hazardous waste number based on preliminary comparison of trade names and active ingredients against the categories of RCRA listed wastes. Other pesticides may also classify as hazardous wastes based on the characteristics of ignitability, corrosivity, or reactivity, but information was not generally available to make these determinations (see 40 CFR 261 Subparts C and D).

b. Discussions with Station personnel indicate that these pesticides are still being used. Other pesticides on this list are considered excess/unwanted or outdated and are therefore no longer used at the Station.

Pesticides that are currently being used and those that are no longer used are also identified in the tables. However, the inventory listed in Table 4 is based upon information collected by the Station more than two years ago. Table 5 quantities were determined more recently by the Station in April 1988.

Applicators stated that a high-pressure sprayer is used outdoors, while hand-held sprayers are primarily used in the greenhouse. Empty pesticide containers are routinely triple-rinsed prior to disposal, with the rinsate usually being applied as a pesticide, rather than being disposed. However, some rinsates from the hand-held sprayers utilized in the greenhouses were reported as being discharged to the septic system, a practice which must be discontinued.

During the facility walk-throughs, the three pesticide storage areas covered in the Station's inventories were inspected: (a) several storage cabinets located in the greenhouse headhouse, (b) a corner in the headhouse basement area adjacent to the furnaces, and (c) a pesticide storage bay that is connected to the garage just east of the root cellars and northwest of the main laboratory.

The headhouse storage cabinets were found to contain a wide variety of small-quantity insecticides, fungicides, and fumigants, that are included on the 1986 inventory list given as Table 4. Most of the pesticides stored here have never been used or are no longer used, as evidenced by the appearance of the containers and the information provided in Table 4. The pertinent observation recorded for the headhouse storage cabinet area include:

- Many of the pesticides were obviously old and outdated as evidenced by the worn appearance of the containers.

- Several containers had missing labels, were open and/or damaged, or were not stored the original pesticide containers.

- Several items were inappropriately stored among the pesticides such as hand soap, matches, and charcoal lighter fluid.

- The pesticide storage cabinet next to the fumigant cabinet was not labelled.

- An ashtray was located immediately adjacent to the storage cabinets.

- Containers were crowded into the cabinets so that most labels could not be seen.

- Several pesticides within a given cabinet did not fit into the category indicated on the outer cabinet label, e.g., fumigant.

- Application records are not maintained for greenhouse operations.

- The storage area is not separated from the rest of the headhouse and is not well-ventilated.

- Personnel reported that pesticide container rinsates are occasionally poured down the sink and into the septic system.

- The pesticide inventory for the greenhouse has not been updated for more than 2 years.

The greenhouse basement pesticide storage area occupies a single corner near the furnaces with larger-quantity containers stacked on pallets. Items stored here included DDT, sevin, chlordane, etc., along with DOW sealant. The area was not identified by a warning label/sign and was not ventilated. Also, cigarette butts were found on the floor in the immediate vicinity and the container labels were not clearly visible. The area is not isolated or capable of being locked up in order to prevent unauthorized or unknowing entry.

The final storage area was a separated portion of the garage adjacent to the root cellars. The storage bay is labelled on the outside and ventilated continuously. Stored within this area are large containers of

herbicides that are fairly well segregated according to formulation. Most containers were stacked on pallets but with no attempt to make the labels easily visible. Pesticides stored in a closet were lying directly on the floor, and bags on the upper shelf were stacked such that no labels were visible.

An open, empty container of 2,4-D was in the center of the storage bay that should have been triple-rinsed and properly disposed of. The inventory list for the pesticide storage bay (see Table 5) that was provided was more recently updated (April 1988) than the greenhouse storage areas. As shown in Table 5, most of the pesticides stored here are still being used, except for the Fenac, Micro-fume, malathion, and Princep.

Two additional pesticide-related findings are noted, the first deals with the miscellaneous, isolated pesticides located outside designated storage areas. Examples include Arassar in the headhouse basement paint/flammable storage area, malathion in the vehicle shop, and strychnine in the barn. The other observation deals with the use of a pesticide container to store non-pesticide material (e.g., a 55-gallon 2,4-D drum used to accumulate oil outside the shop), a practice which should be discontinued.

4.0 RECOMMENDATIONS

The following section provides recommendations to help ensure that Station activities are conducted in full compliance with applicable environmental regulations. Recommendations are made not only in the context of present activities and regulations, but are also directed towards assisting the Station in maintaining compliance as either regulations or activities change. As such, in addition to presenting recommendations under each compliance area, general recommendations are presented that encompass the overall environmental program at the Station.

Several recommendations pertain to notification and discussions with Divisions of the Wyoming DEQ. Although the time and approach for obtaining State involvement will be at the Station's discretion, it is considered preferable that all relevant issues be brought forth at a single time, and at the Department level. Subsequent discussions, and necessary interpretations will then be likely delegated by the DEQ Director to the Division level (Air Quality, Water Quality, etc.). As the Station is aware (from past disclosures to the State regarding the inactive landfill), the State may issue notices of violations as a result of voluntary disclosures. Nevertheless, voluntary disclosures of potential non-compliance items that require State action for correction (i.e., issuance of permits) is considered preferable to the alternative of continued non-compliance and State discovery of the violation.

4.1. Safe Drinking Water Act (SDWA)

4.1.1. Drinking Water

Voluntary sampling of Station drinking water for lead is recommended due to the age of the system (and potential use of lead in cast iron weldings and lead pipe for service connections) and presence of year round residents with children. Sampling and analysis should be in accordance with EPA procedures (listed in 40 CFR 141.23), and results compared with the 0.05 mg/l standard for lead. As an alternative to conducting its own analyses, the Station may request that the City water supplier include the Station as a sampling source in its own compliance monitoring program.

4.1.2. Underground Injection

Continued use of the septic system will be dependent upon a combination of factors including: 1) the elimination of all hazardous waste discharges to the system; 2) minimization of other non-hazardous/non-sanitary wastes discharges; 3) the implementation (and findings) of an environmental assessment (Preliminary Assessment and Site Investigation; PA/SI) to ascertain the potential of the system as a source of environmental (including especially groundwater) contamination; and 4) State of Wyoming discretion/interpretations on allowable uses and discharges.

Hazardous waste discharges to the septic system must be immediately discontinued (see Section 3.4). The minimization of non-hazardous/non-sanitary waste discharges will require that present petroleum hydrocarbon discharges from the vehicle shop floor drain be prevented, through capping or otherwise blocking the floor drain, and utilizing a dry floor sweep for cleaning. Restrictions on other non-hazardous/non-sanitary wastes are believed to be best made following discussions with Wyoming DEQ, Water Quality Division (see below), and results of initial sampling and analysis.

It is recommended that a PA/SI of the septic system proceed (PA completion required 18 months from the Station's inclusion on the Federal Agency Hazardous Waste Compliance Docket) concurrent with notifications and discussions with the Wyoming DEQ on the existence and present use of the system, and planned PA/SI activities. Involvement of the DEQ is recommended because informal discussions indicate that the State is actively involved in identifying septic systems/drain fields with a potential to impact groundwater quality, and is requesting (voluntarily, initially) that operators initiate sampling programs.[a] Also, as discussed in Section 3.1, the system may be subject to a permitting requirement under Chapter IX of the DEQ Water Quality Rules and Regulations.

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a. Discussions with the State indicate that owners are being requested/required to analyze according to EPA method 601 (purgeable halocarbons), 602 (purgeable aromatics), 610 (polynuclear aromatic hydrocarbons), and for petroleum hydrocarbons; see 40 CFR 136, Appendix A, Methods for Organic Chemical Analysis of Municipal and Industrial Wastewater.

Should discussions with the State and/or results of a PA/SI indicate the need for an alternative wastewater treatment method, then contacts with the Cheyenne Public Utilities, Wastewater Division would be appropriate at an early stage to ascertain the feasibility of utilizing the City's wastewater treatment facility. Timely discussions with the treatment facility (even on an informal basis) and review of potential laboratory waste streams should identify early in the planning process any waste stream restrictions, prohibitions, or pretreatment requirements that would be placed upon the Station.

4.2. Clean Air Act (CAA)

4.2.1. Air Contaminant Emission Sources

It is recommended that the Station notify the DEQ that two potential sources of non-permitted emission sources have been identified (shop welding and battery charge vents), and request that these sources be considered insignificant in both emission rate and impact on ambient air quality, as allowed per Section 21 of the State Air Rules. In requesting this determination, the Station should provide summary information on these sources (year of construction, size, hours of operation), to support this contention. If the State DEQ fails to make the above determination, then in all likelihood it would establish a schedule for submission of an appropriate permit application for continued operation, and could place restrictions on use of these sources until the applications have been submitted and approved.

4.2.2. Asbestos

Friable asbestos in the greenhouse (specifically on headhouse furnace/boiler pipes and autoclave) is of sufficiently deteriorated condition that the material sould be removed (preferably) or encapsulated to prevent airborne exposure. Either activity should only be accomplished by a contractor certified for asbestos removals or repair. Additionally, the Station should ensure that employee exposure to friable asbestos is controlled until such removal/encapsulation is accomplished, through compliance with appropriate OSHA standards (including labeling, see 29 CFR 1910.1001).

The Station should ensure (as a contract condition) that asbestos removal is accomplished in accordance with OSHA and NESHAPS (40 CFR 61 Subpart M) standards. These latter requirements will also entail an advance notification from the Station to the Regional EPA (Region 8, Denver), the specifics of which vary depending upon the amount of material involved and nature of the activity (demolition vs. renovation, see 40 CFR 61.145 and 61.146), but includes name and address of the Station owner, scheduled removal dates (start - finish), estimated quantities of material, and Station location.

4.3. Clean Water Act (CWA)

4.3.1. Oil Pollution Prevention

Although not required by regulation (because of the limited quantities of oil in storage), it is nevertheless recommended that the Station establish, in writing, a basic Spill Prevention Control, and Countermeasures Plan that delineates procedures and responsibilities that will be used to: 1) minimize the potential for spills of petroleum or other hazardous substances on the Station and 2) respond to spill situations should they occur. Correspondingly, a designated location should be established for basic equipment (shovels, containers, absorbent) that could be utilized by Station personnel in responding to small spill situations. This plan could be incorporated into, or as an attachment to, an overall Emergency Response Plan for the Station.

4.3.2. National Pollution Discharge Elimination System (NPDES)

It is recommended that the Station notify the Wyoming DEQ of the greenhouse root/pot washer discharge, and request a determination as to its coverage under the NPDES program. The response to this notification will guide future actions (permitting, rerouting of the discharge or exclusion from regulation) with respect to the discharge.

4.4. Resource Conservation and Recovery Act (RCRA)

4.4.1. Hazardous Waste Generation

A regulatory ban on all Class IV wells (wells used to inject hazardous waste above an underground source of drinking waster) has been in effect in Wyoming since November, 1984. A statutory ban on Class IV wells was also passed by Congress in 1984, and became effective in all states in May, 1985.

4.4.1.1. Laboratory Discharges. Therefore, all hazardous waste discharges to the Station septic system (primarily heavy metal solutions, see Table 2), must be discontinued, and containerized for either on-site treatment, or for off-site treatment/disposal.[a] The Station should verify the efficiency of the limestone neutralization tank in treating strong acids, through sampling (if possible), or through bench scale testing or calculations. Basic solutions that are unlikely to be neutralized in the laboratory limestone-filled tank should be neutralized before discharge to a sink. As discussed in Section 3.1, all non-hazardous and non-sanitary wastes should be minimized to the greatest extent practicable.

Empty containers that are used to store chemicals listed in 40 CFR 261.32(e) [acute hazardous ("P") wastes] are themselves hazardous wastes ("P" waste) unless triple rinsed with an appropriate solvent [see 40 CFR 261.32(c)]. This rinsate should be beneficially reused (i.e., in a laboratory assay consistent with the intended use of the original chemical), or must also be managed as an acute hazardous waste. Empty containers of ammonium vanadate (a RCRA "P" waste) used in the Station's laboratory would be one reagent affected by this regulation, (unless the municipal landfill accepted unrinsed "P" waste containers from CESQGs).

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a. Numerous proprietary formulations exist for solidfying/stabilizing liquid heavy metal wastes, such that the waste will no longer meet the characteristics of EP toxicity (and therefore be exempt from RCRA requirements). Such treatment can be conducted on-site by CESQGs (without needing a RCRA treatment permit) when treatment is conducted in a tank or container used to accumulated hazardous waste. Alternatively, such waste must be transported and treated off-site by a RCRA permitted waste management facility.

4.4.1.2. Excess/Unwanted Materials in Storage. The storage of a wide variety of unwanted/excess pesticides and other chemical items jeopardizes the Station's CESQG-status, and thereby places the Station in potential non-compliance with major aspects of RCRA from which it would otherwise be exempt (including Training, Contingency Planning, and Storage Permits). The following recommendations are therefore provided to 1) maintain, over the long-term, integrity of the Station's CESQG-status and 2) eliminate potential health and safety hazards associated with long-term storage of unwanted hazardous items. For reasons discussed later below, it is considered unlikely that the Station can maintain its CESQGs over the near term. The Station should establish and implement a timely schedule for conducting an inventory of existing pesticides and other chemical items and concurrently, initiate procurement requests to obtain the services of a waste management firm for items requiring offsite transport and disposal. Each of these actions is described separately below.

The chemical inventory should be directed towards the identification and segregation of items into three categories: 1) items that will serve a future use at the Station; 2) items which are unlikely to be used at the Station, but which are in otherwise good condition and may be of use by other (preferably ARS) organizations; and 3) wastes, for which no future use by the Station or other organizations is anticipated or allowed (unregistered pesticides and outdated chemicals, for example). Items in Category 2 should be excessed/transferred to other organizations according to procedures/restrictions established by Department of Agriculture and General Services Administration regulation. Items for which alternate users cannot be found should be classified as waste.

Wastes must then be characterized as to hazardous designation (RCRA jurisdiction) and classification (EPA Hazardous Waste No., 40 CFR 261). The vast majority of items should be classified based on chemical names and ingredients, with only a few items (including, for example, some wastes presently stored outside the shop) requiring sampling and analysis to verify/deny a hazardous classification. Items of unknown/questionable characterization should be considered hazardous until determined otherwise

(through sampling and analysis, if necessary). Additionally, some non-RCRA but otherwise toxic wastes (primarily pesticides) should be managed as RCRA wastes to assure treatment and disposal in an environmentally sound manner. Such waste can be evaluated by Station personnel and/or waste disposal contractor on a case-by-case basis.

The above inventory should only be conducted by personnel with a knowledge of chemical hazards and equipped with appropriate personal protective equipment (gloves and eye protection, at a minimum). Similarly, segregation of wastes within a designated accumulation area(s) (see below) should only be accomplished by persons with knowledge of chemical compatibilities (40 CFR 264, Appendix V provides examples of compatibility groupings).

Non-hazardous wastes can generally be disposed via municipal landfill, provided that local ordinances and prohibitions are observed (restrictions on free liquids, for example).

As discussed in Section 3.4, it is expected that a sufficient quantity of waste will be identified (especially acute hazardous "P" listed wastes from unusable pesticides) to result in a temporary loss of the Station's CESQG-status. In anticipation of this occurrence, and to help ensure compliance with RCRA generator and waste accumulation provisions, the Station should establish an accumulation point for hazardous wastes identified from the inventory. This point would be used to temporarily store and segregate hazardous waste, pending packaging, transport, and off-site treatment/disposal. After the backlog of hazardous waste is removed, and the Station reestablishes its CESQG-status, this accumulation point should be closed, and laboratory wastes (the only regularly generated hazardous wastes) should be accumulated and stored in the laboratory.

For those months that the Station does not classify as a CESQG, it must comply with all RCRA regulations covering hazardous waste generation and accumulation. Regulations impacting the Station are specified in 40 CFR 262, of which the following provisions are highlighted:

- 40 CFR 262.12 Notification of EPA
- 40 CFR 262.34 Accumulation Time/Accumulation Requirements

The strong recommendation to initiate procurement requests for the services of a waste disposal contractor, concurrently with conducting the inventory, is based on 1) the strict RCRA limits on waste accumulation times ($\leq$ 90 days)[a] and 2) the desirability of limiting the number of months that the Station loses its CESQG-status.

The services of a waste management firm with capabilities for waste sampling and analysis, segregation and packaging (including expertise with varieties of small-volume chemical items and preparation of "lab packs"), transportation and treatment/disposal should be obtained. Generally reliable "full-service" cost estimates can be obtained based on initial waste inventories developed by the Station, with the contractor providing additional estimates for sampling and analysis of unknown or questionable hazardous wastes.

4.4.2. Waste Oil

Waste oil containers should be labeled "Waste Oil Only" (or similar identifier), and only dedicated containers in good condition should be used. Similarly, any previous labels/markings should be removed or otherwise blocked. Containers must be closed except when wastes are added or removed, and periodic (weekly) inspections of the containers and

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a. All acute hazardous waste ("P" wastes) must be removed from the accumulation point within 90 days. Non-acute hazardous wastes may be stored up to 270 days (quantities not to exceed 6000 kg and generation rate $\leq$ 1000 kg/mo) or indefinitely (quantities not to exceed 1000 kg and generation rate $\leq$ 100 kg/mo). These regulations are detailed in 40 CFR 261.5 and 40 CFR 262.34.

containment sump is recommended to identify leaks or spills. Finally, hazardous or potentially hazardous (uncharacterized) wastes should not be stored in the same vicinity as the waste oil, to preclude, for example, the waste oil recycler from inadvertently removing hazardous wastes along with waste oil (Station personnel should be present whenever the waste oil recycler comes on site to remove waste).

4.4.3 Underground Storage Tanks (USTs)

New regulations (effective December 22, 1988) place specific requirements on the continued use of the Station's underground gasoline (leaded and unleaded) storage tanks. These regulations require that USTs of 25 years or older (or of unknown age) initiate by December 22, 1989, either monthly monitoring for leak detection or a combination of monthly inventory control and annual tank tightness testing. Either approach may be used until 1998, at which time tanks must be closed (removed from service) or upgraded. Inventory controls and tank tightness must be conducted in accordance with 40 CFR 280.43(a) or (b), and 280.43(c), respectively. Additional requirements in these regulations identify responsibilities and procedures for notification of suspected releases from USTs, and for tank closures (40 CFR 280.71).

It is recommended that the Station implement the inventory control and annual tank tightness testing system through the services of an appropriate contractor (discussions during the Station visit indicated the availability of a local firm to provide this service). Although the Station will have the option of upgrading these regulated USTs by 1998, it is be recommended (due to the unknown age and steel construction) that the tanks be closed prior to that time, and replaced with tanks meeting the performance standards for new UST systems (40 CFR 280.20). Such replacement should become an immediate priority should inventory control/tank tightness testing (or other evidence) indicate that the existing tanks are leaking.

4.5. CERCLA/SARA

4.5.1. EPA Notifications

It is recommended that the Station update or otherwise revise its CERCLA 103(c) notification of December 18, 1987, to include the inactive landfill. Preliminary assessments for the Station's two units (septic system and landfill) must then be prepared within 18 months of the Stations inclusion on the Federal Agency Hazardous Waste Compliance Docket.[a] Similarly, the next update to the RCRA Inventory of Federal Hazardous Waste Activities (a 1990 submittal) should include the landfill as an inactive CERCLA unit.

4.5.2. SARA Title III

Federal facilities are exempt from SARA Title III but voluntary compliance is nevertheless being requested by EPA. As such, the Station should consider reporting chemical inventories under SARA Title III Sections 311 and 312. Because the Station does not store extremely hazardous substances in excess of the threshold planning quantities, such reporting would be limited to other hazardous substances that are present in excess of 10,000 lbs, and primarily, if not solely, represent propane, gasoline and other petroleum products.[b] Because such reporting potentially impacts other Northern Plains Area facilities, it is recommended that the Area Safety Office coordinate the reporting of these inventories.

Additional information on reporting requirements and procedures can be obtained from EPA at the Chemical Emergency Preparedness Hotline at 1-800-535-0202.

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a. The Station should also verify with EPA the anticipated date of its initial inclusion on the docket.

b. "Other Hazardous Substances" are those items for which a Material Safety Data Sheet would be required under OSHA (29 CFR 1910.1200)

4.6. Toxic Substances Control Act (TSCA)

Due to the absence of PCBs and PCB-contaminated material at the Station, compliance related issues with respect to TSCA are minimal. The only recommendation made concerning PCBs is to contact either Cheyenne Light, Fuel, and Power Company, or the Fire Department with jurisdiction at the Station, in order to determine the existence and location of any on-site PCB electrical transformers. Such information would prove useful to Station personnel in the event of a spill release from a transformer or a fire. Provided any PCB transformers are identified at the Station, the Cheyenne utility company would still retain responsibility for meeting any TSCA requirements concerning reporting, inspection, servicing, and waste disposal.

4.7. Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA)

The recommendations presented below are directed at those operations/practices that were identified as posing potential FIFRA-compliance concerns.

The applicable portions of 40 CFR 165, dealing with the disposal and storage of pesticides and pesticide containers, are only recommendations by EPA, and are not mandatory requirements. However, for unwanted, excess, or outdated pesticides being stored at the Station, these suggestions will be superseded by mandatory requirements under RCRA, if classified as hazardous waste. The compliance-related issues, impacts, and consequences associated with RCRA regulations are much more serious and are more fully described in Section 3.4 of this report. Recommendations detailed there are intended to establish full compliance with RCRA-mandated requirements for the unwanted/excess pesticide products identified as RCRA hazardous wastes. Efforts to make such identifications should be initiated as soon as possible to maintain regulatory compliance in Station operations. Since these issues are dealt with in the RCRA sections, most of the recommendations presented below are directed at managing the pesticides that are currently used on-site or planned for future use.

The current practice of discharging greenhouse pesticide container or spray equipment rinsates to the septic system should be discontinued immediately. The rinsates should be added to spray mixtures and applied in the greenhouse or in the field, as specified in 40 CFR 165.9(d). It is also strongly recommended that the triple-rinsed and emptied containers not be reused or be allowed to accumulate at the Station, but should be punctured and sent to the City's sanitary landfill along with the Station's other municipal wastes.

The storage of pesticides at the Station can be improved significantly by segregating the large proportion of unwanted, excess, outdated, and cancelled pesticides from storage areas so that proper storage can be provided for those products currently used. For any useful pesticides that are discovered to be missing the registered labels or are identified as suspended and cancelled use pesticides, the manufacturer should be contacted to obtain proper replacement/amended labels.

The storage procedures and criteria described in 40 CFR 165.10 are strongly recommended for sites and facilities storing pesticides that are classified as highly or moderately toxic (i.e., toxicity categories I and II respectively). Such pesticides are required by 40 CFR 162.10 to display on the front label the signal words DANGER, POISON, or WARNING, or the skull and crossbones symbol. Since many of the pesticides at the Station fit these classifications the following recommendations based upon 40 CFR 165.10 are deemed appropriate:

- Removal of unwanted/excess pesticides from all three storage areas for disposition as hazardous waste or excessed to other organizations which could use them.

- Consolidation of remaining small-quantity pesticides into properly segregated, headhouse storage cabinet area. Storage cabinets should be labelled, lockable, arranged so that pesticide labels are clearly visible, and relocated, if possible, to a more isolated area of the headhouse/greenhouse that is also better ventilated.

- Elimination of the unlocked, unlabelled headhouse basement storage area.

- Placement of pesticides currently stored on the closet floor of the pesticide storage bay on pallets or shelves and rearrangement of palletized pesticides (segregated by formulation) with labels clearly visible. Containers should be triple-rinsed and disposed as soon as they are emptied.

- Pesticide storage inventories (especially for the headhouse storage cabinets) should be updated following removal and proper disposition of products that are no longer used; and periodically updated thereafter (e.g., semiannually).

- Establishment of "No Smoking" zones in the immediate vicinity near the storage areas.

- Implementation of regularly-scheduled container inspections.

- All pesticides not in use should be returned to a designated storage area.

4.8. Miscellaneous

The following recommendations potentially impact several disciplines of environmental compliance, and are primarily based on good management practices, (as opposed to specific regulatory citations and requirements). The recommendations are generally self-explanatory, and are therefore listed below without extensive discussion.

1) Containers for hazardous substances should only be used for their originally intended purposes, or rinsed and relabelled when used to store another substance. Pesticide containers should not be reused for any purpose.

2) A file of Wyoming environmental regulations and selected Federal regulations (specifically RCRA waste identification and generator standards 40 CFR 261 and 262) should be maintained at the Station. Wyoming regulations are available at no charge from the DEQ. Correspondingly, the Station should designate a person or persons with responsibility for maintaining an awareness of regulations impacting the Station. As discussed during the site visit, the journal Pollution Engineering is an excellent source of information on environmental regulatory updates, industry/waste management contractor services, products, and training.

3) The Station should ensure that all new projects undergo an informal or formal review to identify, at an early stage in project planning, any environmental concerns or permitting requirements (especially permits to construct).

4) On an annual or semi-annual basis, the Station should conduct an complete chemical inventory to prevent the accumulation of unwanted materials, and to help ensure that items are utilized (prioritized for use) before shelf-life expirations.

ATTACHMENTS

ATTACHMENT 1

This environmental audit was conducted on November 15 through 17, 1988, by senior environmental program specialists with the Idaho National Engineering Laboratory (INEL). The audit team members and major responsibilities were:

- Martin J. Edwards - RCRA and CERCLA/SARA, and team leader
- Douglas D. Nishimoto - FIFRA and TSCA
- Carol Vega - CAA, CWA, and SDWA

INEL personnel were accompanied by Mr. Ernest M. Affa, ARS Northern Plains Area Safety Manager, and Tracy B. Plessinger, INEL Project Manager.

Station personnel contacted during the audit included:

- Jerry Schuman, Ph.D. (Research Leader)
- JoAnn Hagen
- Larry Griffith
- Chris Mahelona
- Jim Pry
- Ken Scott
- Ernie Taylor

The audit team especially thanks Dr. Schuman and Ms. Hagen for their cooperation and assistance during the site visit.

ATTACHMENT 2(a)

RCRA CHARACTERISTIC WASTE FOR HEAVY METALS

Heavy Metal	Maximum Concentration (mg/l)[a]	EPA Hazardous Waste No.
Arsenic	5.0	D004
Baruim	100.0	D005
Cadmium	1.0	D006
Chromium	5.0	D007
Lead	5.0	D008
Mercury	0.2	D009
Selenium	1.0	D010
Silver	5.0	D011

a. Wastes with contaminants in excess of these levels are RCRA hazardous wastes. Levels represent concentrations in a waste extract, using the extraction procedure (EP) methods 40 CFR 261, Appendix II.

ATTACHMENT 2(b)

RCRA SPENT SOLVENT ("F" WASTE) LISTING

Industry and EPA hazardous waste No.	Hazardous waste	Hazard code
F001	The following spent halogenated solvents used in degreasing: Tetrachloroethylene, trichloroethylene, methylene chloride, 1,1,1-trichloroethane, carbon tetrachloride, and chlorinated fluorocarbons; all spent solvent mixtures/blends used in degreasing containing, before use, a total of ten percent or more (by volume) of one or more of the above halogenated solvents or those solvents listed in F002, F004, and F005; and still bottoms from the recovery of these spent solvents and spent solvent mixtures.	(T)
F002	The following spent halogenated solvents: Tetrachloroethylene, methylene chloride, trichloroethylene, 1,1,1-trichloroethane, chlorobenzene, 1,1,2-trichloro-1,2,2-trifluoroethane, ortho-dichlorobenzene, trichlorofluoromethane, and 1,1,2-trichloroethane; all spent solvent mixtures/blends containing, before use, a total of ten percent or more (by volume) of one or more of the above halogenated solvents or those listed in F001, F004, or F005; and still bottoms from the recovery of these spent solvents and spent solvent mixtures.	(T)
F003	The following spent non-halogenated solvents: Xylene, acetone, ethyl acetate, ethyl benzene, ethyl ether, methyl isobutyl ketone, n-butyl alcohol, cyclohexanone, and methanol; all spent solvent mixtures/blends containing, before use, only the above spent non-halogenated solvents; and all spent solvent mixtures/blends containing, before use, one or more of the above non-halogenated solvents, and, a total of ten percent or more (by volume) of one or more of those solvents listed in F001, F002, F004, and F005; and still bottoms from the recovery of these spent solvents and spent solvent mixtures.	(I)
F004	The following spent non-halogenated solvents: Cresols and cresylic acid, and nitrobenzene; all spent solvent mixtures/blends containing, before use, a total of ten percent or more (by volume) of one or more of the above non-halogenated solvents or those solvents listed in F001, F002, and F005; and still bottoms from the recovery of these spent solvents and spent solvent mixtures.	(T)
F005	The following spent non-halogenated solvents: Toluene, methyl ethyl ketone, carbon disulfide, isobutanol, pyridine, benzene, 2-ethoxyethanol, and 2-nitropropane; all spent solvent mixtures/blends containing, before use, a total of ten percent or more (by volume) of one or more of the above non-halogenated solvents or those solvents listed in F001, F002, or F004; and still bottoms from the recovery of these spent solvents and spent solvent mixtures.	(I,T)

ATTACHMENT 3

PERMITTING EXEMPTIONS FOR AIR CONTAMINANT EMISSION SOURCES[a]

Approval to construct or modify shall not be required for:

(i) The installation or alteration of an air pollutant detector, air pollutants recorder, combustion controller, or combustion shutoff.

(ii) Air conditioning or ventilating systems not designed to remove air pollutants generated by or released from equipment.

(iii) Fuel burning equipment other than a smokehouse generator which has a heat input of not more than 25 million BTU per hour (6.25 billion gm-cal/hr) and burns only gaseous fuel containing not more than 20 grains total sulfur per 100 std. ft^3; has a heat input of not more than 10 million BTU/hr (2.5 billion gm-cal/hr) and burns any other fuel.

(iv) Mobile internal combustion engines.

(v) Laboratory equipment used exclusively for chemical or physical analyses.

(vi) The installation of air pollution control equipment.

(vii) Gasoline storage tanks at retail establishments.

(viii) Such other minor sources which the Administrator determines to be insignificant in both emission rate and ambient air quality impact.

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a. From Wyoming Air Quality Standards and Regulations (Rules and Regulations of Department of Environmental Quality, Air Quality Division, Chapter 1, Section 21).