Resolution Test Chart

1 of 1

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Ames Laboratory
Site Environmental Report
Calendar Year 1992

Ames Laboratory
Iowa State University
Ames, Iowa 50011-3020

Prepared for the
U. S. Department of Energy
Under Contract No. W-7405-Eng-82

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1.0 EXECUTIVE SUMMARY

The summarized data and conclusions from the Ames Laboratory environmental monitoring program are presented in this Annual Site Environmental Report. This program is a working requirement of Department of Energy (DOE) Order 5484.1, "Environmental Protection, Safety, and Health Protection Information Reporting Requirements" and Order 5400.1, "General Environmental Protection Program."

Ames Laboratory is located on the campus of Iowa State University (ISU) and occupies eleven buildings owned by the DOE. The Laboratory also leases space in three ISU owned buildings. A new DOE owned office building is under construction. Laboratory research activities involve less than ten percent of the total chemical use and one percent of the radioisotope use on the ISU campus.

Pollution awareness and waste minimization programs and plans implemented in 1990 are continuing to date. Included in this effort was the implementation of a waste white paper and green computer paper recycling program. Most of the chemical and radiological "legacy" wastes have been properly disposed of.

Ames Laboratory (AL) is responsible for a small chemical burial site, located on ISU property. The site was used for the disposal of chemical and metal slags from thorium and uranium production. Samples of water from existing test wells, and upstream and downstream sites on the nearby Squaw Creek, have not detected migration of the buried materials off site. A Remedial Investigation and Feasibility Study (RI/FS) work plan for additional studies at the site was reviewed and approved by the DOE Chicago Field Office (CH), DOE Headquarters (HQ) and the Iowa Department of Natural Resources (DNR). A National Environmental Policy Act (NEPA) review of the RI/FS resulted in a categorical exclusion (CX) finding which has been approved by the DOE. Surface, hand auger and deep boring soil samples have been collected from the site. The analytical results are pending. Six new monitoring wells have been installed and sampled. Analytical results are pending.

Ames Laboratory is responsible for an area contaminated by diesel fuel that leaked from an underground storage tank (UST) in 1970. The tank was removed that year. Soil borings and groundwater have been analyzed for contamination and a preliminary assessment written. A subcontractor will be hired in September, 1993, to remediate the site. The NEPA review for this investigation resulted in a CX.

Nine small inactive waste sites have been identified for characterization. The NEPA review for this work resulted in a CX determination. The work plans were approved by AL and CH. A subcontractor has surveyed and sampled the sites. Analytical results are pending.

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2.0 INTRODUCTION

2.1 SITE DESCRIPTION

The Ames Laboratory of the U. S. DOE is located on the campus of Iowa State University at Ames, Iowa (Figures 1 through 4). The buildings owned by the DOE are:

<u>Building</u>	<u>Gross Square Feet</u>
Spedding Hall	106,885
Wilhelm Hall	61,929
Metals Development Building	97,594
Computer Services Building	1,672
Campus Warehouse Building	16,594
Mechanical Maintenance Building	8,540
Maintenance Shops Building	7,503
Paint and Air Conditioning Shops Building	4,998
Construction Storage Shed	4,320
Storage Shed	2,100
Storage Shed	500

A DOE-owned 42,000 square foot administrative office is under construction. It is expected to be completed in the spring of 1994. In addition to the buildings owned by the DOE, Ames Laboratory rents a net total of 26,070 square feet of space from ISU. In 1987 the DOE transferred ownership of the buildings it owned at the Applied Sciences Complex (ASC) site to ISU. This site is located 1 mile northwest of the ISU campus (Figure 5). The buildings included were the Applied Science Center building, ASC Annex, Radioactive Waste Disposal, and Test Cell. Ames Laboratory retains beneficial use of the Radioactive Waste Disposal building. This building also houses the Alpha Containment Facility, a Laboratory facility which uses small amounts of radionuclides.

The ISU campus is surrounded by the City of Ames, Iowa (Figures 2 and 3), population 48,000. An estimated 52,000 people live within a 5-mile radius of the campus. The student population of ISU is about 25,000.

The primary missions of Ames Laboratory are to:

1. Conduct basic and intermediate range applied research in physical, mathematical, and engineering sciences that underlie energy technologies and other areas of national importance.

2. Utilize the Laboratory's unique strengths in materials preparation and processing, chemical sciences and materials reliability to solve complex materials problems in energy production and utilization.
3. Contribute to the training of new scientific and engineering professionals.
4. Transfer the information and technologies resulting from the Laboratory's research efforts to the private sector and other governmental units to stimulate economic development on the local, regional, and national levels.

The climate is temperate, continental, and subject to wide temperature and precipitation ranges throughout the year. Mean monthly temperature varies from a low of 19 degrees Fahrenheit in January to a high of 75 degrees Fahrenheit in July. Average rainfall equivalent precipitation varies from less than 1.0 inches in January to over 5.5 inches in June.

The region is gently rolling with a slight pitch to the southeast. Surface material is glacial drift with a depth of about 65 feet. This material is underlaid by predominantly limestone bedrock. In the campus area, depth to ground water is about 10 feet. At the ASC site this depth is about 15 feet. Surface run-off from both areas goes to Squaw Creek and Skunk River which have a combined daily flow of 170 million gallons.

2.2 Organization and Administration

Ames Laboratory is operated by Iowa State University under Contract No. W-7405-eng-82 with the U. S. Department of Energy. The Department of Energy's Chicago Operations Office oversees operation of the Laboratory.

A map of Iowa showing county boundaries and names. Two concentric circles are centered on Boone County. The inner circle is labeled "16 MILES (25.7 Km)" and the outer circle is labeled "50 MILES (80 Km)". The map includes county names such as Lyon, Boone, Des Moines, and others.

FIGURE 2: AMES

FIGURE 4: AMES LABORATORY FACILITIES ON THE IOWA STATE UNIVERSITY MAIN CAMPUS

IOWA STATE UNIVERSITY APPLIED SCIENCE CENTER

FIGURE 5

1992 SAMPLES
CREEK WATER

SCALE: 2 1/2" = 1 MILE

FIGURE 6: ALCDS VACINITY

Figure 7

Ames Laboratory Chemical Disposal Site

3.0 COMPLIANCE SUMMARY

3.1 CALENDAR YEAR 1992

Ames Laboratory was not in compliance with all environmental regulations during 1992. The non-compliance issues were identified in the Laboratory's Self Assessment completed in December of 1991, by a Tiger Team assessment in February of 1992 and by the DOE approved Tiger Team Corrective Action Plan. The non-compliances are in the areas of air and groundwater monitoring and the Federal Facilities Compliance Agreement.

3.1.1 Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)

In accordance with the Code of Iowa Section 455B.426, Registry of Hazardous Waste or Hazardous Substance Disposal Sites, a chemical disposal site used by Ames Laboratory from 1958 through 1966 was classified by the director of the Iowa Department of Natural Resources (DNR) as "c. Not a significant threat to the public health or environment---action may be deferred." Remedial Investigation and Feasibility Study (RI/FS) work plans and a National Environmental Policy Act (NEPA) review were approved for this site by DOE and Iowa DNR in 1992. The RI/FS work is in progress. The RI report, with applicable data, will be available by September 30, 1993.

The Laboratory is subject to the emergency reporting requirements of the Superfund Amendments and Reauthorization Act (SARA) in Title III, Section 303. A facility representative and a listing of all hazardous chemicals on site have been reported to the local emergency planning committee, in this case the City of Ames Fire Department.

A subcontractor is characterizing nine inactive waste sites to confirm they are free of any residual contamination. The sites will be released for unrestricted use.

3.1.2 Resource Conservation and Recovery Act (RCRA)

Ames Laboratory has two RCRA waste generator identification numbers issued by Region VII of the Environmental Protection Agency (EPA). The Lab was previously only a small quantity generator. Preparations for a February, 1992 Tiger Team inspection resulted in monthly waste generations in excess of 1000 kg hazardous waste and 1 kg acutely hazardous waste. In 1992, 1600 cubic feet of low level radioactive "legacy" waste were properly disposed of. By definition, these disposals designated the Laboratory as a "large quantity generator" which means it is no longer exempt from many of the administrative requirements of RCRA. This has caused the Laboratory additional requirements regarding handling and disposal practices for its

Ames Laboratory discharges are approximately 0.7% of the total waste water processed per day by the city waste water treatment facility. The City of Ames has an NPDES permit. The City of Ames has an agreement for wastewater treatment with ISU, which includes Ames Lab. Both the City of Ames and the University sample ISU wastewater effluent as part of this agreement. The lab notifies the city directly, and ISU, of any discharges from the wash water storage tanks at the waste disposal building. There were two such discharges in 1992. See Table 3-1.

No stormwater permits are necessary for current lab operations. The office lab building construction site is covered by a stormwater permit held by ISU.

3.1.6 Safe Drinking Water Act (SDWA)

Drinking water for the Laboratory is supplied by the University which obtains its water from the City of Ames public water system. The Ames water system is tested by the city to meet the standards of the SDWA. The Tiger Team Corrective Action Plan requires a groundwater protection program to be developed and implemented by the Laboratory. That process has begun. Monitoring sites have been identified.

3.1.7 Toxic Substances Control Act

Approximately one ton of asbestos waste was properly disposed in 1992. The Laboratory complies with the State of Iowa Solid Waste Disposal Rule #102.14 and 40 CFR 61, Subpart M (asbestos NESHAP). Approximately 10 gallons of PCB contaminated oil were properly disposed in 1992

3.1.8 National Historic Preservation Act

No historic resources have been identified near any of the Ames Laboratory facilities or lab controlled areas. No archeological resources have been identified near the facilities or controlled areas.

3.1.9 Current Issues and Actions

A Tiger Team Assessment was completed in February of 1992. A Corrective Action Plan has been written to address the non-compliance issues at the Ames Laboratory. The non-compliances are in the areas of DOE directed air and groundwater monitoring and the Federal Facilities Compliance Agreement.

3.1.10 Summary of Permits

Ames Laboratory currently has no environmental discharge, storage or disposal permits. A Federal Facility Compliance Agreement is being written with the assistance of the DOE-CH Waste Management Office.

Table 3-1

**Ames Laboratory Waste Water Discharges to the Sanitary Sewer
Third Quarter, 1992**

1. Release Date: September 2, 1992

Volume: 2800 gallons

pH: 7.53

Conductance: 738 uMHOs/cm

Radioactivity:

Isotope	Concentration uCi/ml	% of Permitted Concentration	Total Released
H-3	5.6×10^{-6}	0.008	59.1 uCi
K(natural)	3.7×10^{-7}	3.7	9.4 uCi
Co-60	ND		
Cs-137	7.3×10^{-8}	0.18	1.9 uCi
Th	2.5×10^{-8}	0.25	0.3 uCi
U(natural)	3.9×10^{-8}	0.12	0.4 uCi

2. Release Date: September 10, 1992

Volume: 2800 gallons

pH: 9.30

Conductance: 582 uMHOs/cm

Radioactivity:

Isotope	Concentration uCi/ml	% of Permitted Concentration	Total Released
H-3	7.8×10^{-6}	0.008	82.6 uCi
K(natural)	5.2×10^{-7}	5.2	5.5 uCi
Co-60	1.9×10^{-8}	0.06	0.2 uCi
Cs-137	1.0×10^{-7}	0.26	1.1 uCi
Th	ND		
U(natural)	2.2×10^{-8}	0.07	0.3 uCi

Table 3-1

**Ames Laboratory Waste Water Discharges to the Sanitary Sewer
Third Quarter, 1992 (continued)**

Total Radioactivity Released:

Isotope	Total Released
H-3	133.7 uCi
K(natural)	9.4 uCi
Co-60	0.2 uCi
Cs-137	1.9 uCi
Th	0.3 uCi
U(natural)	0.7 uCi

3.2 FIRST QUARTER 1993

3.2.1 Compliance Status and Permit Summary

The compliance status of the Laboratory with regard to environmental statutes and permitting has been under review as a result of the Tiger Team assessment of the Laboratory in February, 1992. The Ames Laboratory Corrective Action Plan addresses needed corrections and additions. Quarterly Action Plan Progress Reports are submitted to DOE. The NEPA categorical exclusions for the UST and IWS projects were approved in March, 1993.

3.2.2 Current Activities

A diesel fuel contaminated area, located where a former Emergency Generator underground fuel tank leaked 22 years ago, has been reported to the State of Iowa Department of Natural Resources. A subcontractor will be selected in September, 1993, to remediate the site. The major portion of the remediation is expected to occur in the summer of FY 1994, after a small computer building has been removed from the site. DNR has been kept abreast of all UST developments. See Figure 4.

Ames Laboratory is responsible for a small, closed, chemical burial site. It is located on ISU property, and it was used from 1958-1966 for disposal of radiological and chemical hazardous wastes from lab operations. See Figures 5, 6 and 7. The DOE and Iowa DNR approved RI/FS work plans have been implemented by the subcontractor. Iowa DNR approved the RI/FS plans February 17, 1993. To date, all the prescribed soil samples have been collected and the monitoring wells have been developed and sampled. The RI report is due by the end of FY 1993. The FS report is due by the end of calendar year 1993. The remedial design (RD) process will be accomplished under a new subcontract during the first three quarters of FY 1994. The remedial action will be accomplished under another subcontract during FY 1995. A follow-up monitoring period will be established by DNR.

A subcontractor is characterizing nine small inactive waste sites. The characterizations include review of existing data, radiological surveys, supplemental sampling and analysis, and report preparation.

The work plans were approved by AL and CH. A CX NEPA determination was made. A hand instrument survey of the sites has been accomplished. Soil and groundwater samples have been collected, and are in analysis.

The sites are areas that were, or could have been, contaminated by Ames Laboratory or ISU activities, or incidents related to these activities, during the 1940's and 1950's. The nine sites are:

Ames Municipal Airport
Ames Municipal Cemetery
Annex I
Annex II
Little Ankeny Debris Site
Blockhouse Site
Grand Avenue Underpass
Old Sewage Treatment Plant
Applied Sciences Complex (ASC)

Numerous previous assessments of these sites included sampling and testing by Ames Laboratory. Some remedial activities were done to remove contaminated material from some of the sites. The recent Tiger Team Assessment of Ames Laboratory indicated "uncertainty" about these sites.

The characterizations are for independent confirmation that the sites are free of residual contamination. The sites will be released for unrestricted use.

4.0 ENVIRONMENTAL PROGRAM

4.1 Environmental Monitoring

Liquid aqueous wastes, when generated at the Laboratory's Radioactive Waste Disposal Facility (Figure 5), are analyzed for radioactivity before release to the sanitary sewer as required by DOE Order 5480.1 (1). Samples are collected before release. They are analyzed for radioactive content using gamma ray spectroscopy, gas proportional counting for gross beta and alpha activity, and a liquid scintillation technique. Two releases of liquid aqueous waste were made during September, 1992. See Table 3-1. When generated, results of sample analysis and quantities released are reported to the City of Ames, Iowa, the DOE Chicago Operations Office and Idaho Operations Office.

4.2 Environmental Permits

Ames Laboratory does not have any NPDES permits for direct discharge or surface runoff to the environment. AL discharges all liquid wastes to the ISU sanitary sewer system, which discharges into the City of Ames sewer system. The Laboratory is included in the University's discharge contract with Ames. The contract between ISU and Ames was renewed in 1989 for five years. The contract requires the University to analyze its waste discharges periodically. This discharge includes the contribution by Ames Laboratory. Ames Laboratory contributes an estimated 4% of the total ISU sanitary waste which comprises 10-20% of the sanitary wastes received by the Ames Water Pollution Control Facility.

Asbestos wastes, from renovation projects, were buried at the Ames Story Environmental Landfill (a private company). No landfill permits are required. The Laboratory complies with the State of Iowa Solid Waste Disposal Rule #102.14 and 40 CFR 61, Subpart M (asbestos NESHAP).

Employee fire extinguisher training sessions involving open burning of flammable liquids and solids are permitted by State of Iowa open burning statutes (7). Notification of the local fire department is required. One modification was made in 1992.

4.3 Draft and Final Impact Statements

Not Applicable.

4.4 Summary of Significant Environmental Activities

A review of analytical results from soil analyses, taken following a final radiological survey in 1990 at the Ames Water Pollution Control (sewage) Plant (Figure 2), have identified small areas with thorium contamination levels of 5 to 6 pCi/gm (1.8 to 2.2×10^{-1} Bq/g) soil which need additional restoration to meet requirements of 40 CFR 192 (5). The additional restoration will be completed in 1993. A subcontractor has already been hired. The site also has depressions, where the removed soil was not adequately restored, which will require filling. This site resulted from the release of thorium to the City of Ames sanitary sewer system in 1952. Contaminated soil was removed in 1988 for burial at the DOE approved Hanford Facility at Richland, Washington.

An underground storage tank used to store emergency generator diesel fuel was removed in 1991 and the site sampled. No contamination was found. The tank was located at the Metals Development Building. The removal was accomplished in accordance with Iowa DNR's underground storage tank regulations, 567 IAC 135.

4.5 Pollution Awareness and Waste Minimization Programs

A waste minimization plan and program was implemented in 1990, as required by DOE Order 5400.1. Elements of the plan include:

- A statement of management support and commitment.
- A waste minimization policy for the Laboratory.
- Objectives and numerical goals.
- Methods of tracking waste production.
- Employee awareness, training and incentive programs.
- Program performance, evaluation and quality assurance.

The Laboratory has been engaged in many waste minimization activities and procedures. The procedures have reduced the quantities of non-hazardous and hazardous wastes generated by the Laboratory's research efforts. Examples include:

- Collection of surplus chemicals for re-issue.
- Review of Purchase Orders to prevent duplication or over-supply.

- Collection of surplus mercury for resale.

All other non-hazardous waste generated by the Laboratory, e.g., paper, garbage, trash et cetera, is collected and transported to the City of Ames' Waste Recycling Plant where it is processed. Combustible waste is used as fuel in the city's electrical utility power plant. Scrap metal is sold for re-use.

5.0 ENVIRONMENTAL RADIOLOGICAL PROGRAM

5.1 Radioactive Effluent Data

The Ames Laboratory routinely monitors waste water containing radioactive contamination from the Waste Disposal Building, before release to the sanitary sewer. Two releases of contaminated wastewater were made to the Ames sanitary sewer system during September, 1992. The level of radioactivity released was well below 10 CFR 20.303 and DOE Order 5400.5 (Chapters II and III) limits. See Table 3-1. The City of Ames was properly notified. No liquid effluent releases are made directly to the environment.

5.2 Environmental Sampling for Radioactivity

Ames Laboratory is responsible for a small chemical burial site, located on ISU property, which was used from 1958-1966 for disposal of hazardous wastes and wastes from thorium and uranium production (Figures 5, 6 and 7). Survey instrument monitoring was performed at the site in 1980 and 1987. Contaminated surface soil was removed and properly disposed both times at the DOE approved Hanford Facility at Richland, Washington.

Test wells and a reference well were installed at the site in 1989. Testing of the wells and water from upstream and downstream sites on the nearby Squaw Creek was begun in 1990. Comparison of the reference well soil and water samples with those from the test wells shows that the levels of trace elements measured were essentially the same, i.e., background levels (Table 5-1).

The Iowa DNR requested that a Site Assessment Plan be prepared to determine the environmental impact of the site. The plan was approved and a Remedial Investigation/Feasibility Study (RI/FS) work plan was prepared. It was approved by AL, CH, HQ and DNR. The Elements of the work plan are as follows:

1. Collection and review of historical data.
 - a. Past site activities.
 - b. Documents relating to site.
 - c. Interviews.
 - d. Inventory of wells in a one-mile radius.
2. Field investigation.
 - a. Field screening/analysis.
 - b. Geophysical investigations.
 - c. Monitor well and borehole drilling.
 - d. Geological and hydrogeological investigations.

3. Sample collection.
 - a. Sampling objectives.
 - b. Frequency and location.
 - c. Sample quantities.
 - d. Equipment decontamination.
 - e. Duplicate samples and blanks.
 - f. Analytical methods.
4. Laboratory analysis.
5. Data analysis.
6. Site characterization summary.
 - a. Geologic characterization.
 - b. Hydrogeologic characterization.
 - c. Geophysical characterization.
 - d. Preliminary conclusions on potential migration pathways.
7. Remedial investigation generated waste disposal.
8. Risk assessment and report.
9. Treatability study/pilot testing.
10. Remedial investigation report.
11. Feasibility study report.

5.3 Reporting Potential Dose to the Public

As a policy, airborne releases from the Ames Laboratory complex on the ISU campus are minimized or eliminated by experiment design or source limitation. Radioactive materials handled at the Ames Laboratory include radiation instrument calibration sealed sources and standards, laboratory quantities of normal and depleted uranium, thorium metals, plutonium, and uranium-235.

Research activities using less than 0.5 gm quantities of several isotopes of plutonium and gram quantities of uranium-235, are conducted in a single glovebox facility designed for inductive coupled plasma (ICP) spectroscopy research. This glove box is located at the Alpha Containment facility at the Applied Sciences Complex site. During 1992, no work with these radionuclides was conducted due to the renovation of the building that houses this glove box facility.

Work with uranium and thorium has consisted of arc melting the solid metal into alloys or electro-transport purification of small batches of 75 grams or less. All this work is done either under vacuum or in inert gas sealed atmospheres. No venting of the process is done until the chambers are opened on the solidified material. Approximately 800 grams of depleted Uranium was arc melted during 1992. No work with thorium metal was done during 1992.

The National Emission Standards for Hazardous Air Pollutants; Radionuclides, under Subpart H of 40 CFR Part 61 (8), requires that an Air Emission Annual Report be submitted by each DOE facility emitting any radionuclides (other than radon) into the air. Using the guidance found in 40 CFR 61.94, an annual report for 1992 was prepared. According to the guidance and based on the isotope inventory in Curies per year used at the Laboratory, air emissions are not required to be monitored at the Laboratory. However, Appendix D to 40 CFR Part 61 does provide a method for estimating the radionuclide emissions for a year for reporting purposes, based on the amount of radionuclides in Curies used at the facility. This information, and other required parameters, were used to calculate an effective dose equivalent to the public due to estimated radionuclide emissions from the Laboratory. The effective dose equivalent values were calculated using the EPA-approved computer model CAP88-PC v. 1.0. The input parameters and dose estimates are shown in Table 5-2.

5.4 Unplanned Releases

There were no unplanned or accidental radiological releases from Ames Laboratory during 1992.

Table 5-1

AMES LABORATORY CHEMICAL DISPOSAL SITE
Trace Elements and Cyanide in Water

Average concentrations for 1992

Concentrations in parts per million

ELEMENT	REFERENCE WELL	SOUTH TEST WELL	NORTH TEST WELL	SQUAW CREEK UP	SQUAW CREEK DOWN
BERYLLIUM	<0.0008	<0.0008	<0.0008	<0.008	<0.008
CHROMIUM	<0.004	<0.004	<0.004	<0.004	<0.004
COBALT	<0.009	<0.009	<0.009	<0.005	<0.005
LITHIUM	0.03	0.07	0.11	0.01	0.01
MERCURY	<0.1	<0.1	<0.1	<0.1	<0.1
THALLIUM	<0.07	<0.07	<0.07	<0.05	<0.05
THORIUM	<0.02	<0.02	<0.02	<0.01	<0.01
URANIUM	<0.06	<0.06	<0.06	<0.05	<0.05
YTTRIUM	<0.001	<0.001	<0.002	<0.001	<0.001
ZIRCONIUM	<0.002	<0.002	<0.002	<0.002	<0.002
CYANIDE	<1.	<1.	<1.	<1.	<1.

Table 5-2

Summary of Input Parameters

<u>Isotope</u>	<u>Ci/yr</u>	<u>Adjustment Factors (Source) Term Ci/yr</u> (Appendix D to Part 61)
----------------	--------------	--

Iowa State University Campus Site

Uranium (depleted)	3.8×10^{-4}	1.0×10^{-6} (solid) 3.8×10^{-10}
Uranium-234 in depleted Uranium	1.6×10^{-5}	1.0×10^{-6} (solid) 1.6×10^{-11}

Alpha Containment Facility Site

No radionuclides
used at this site
during 1992.

Compliance Assessment

Ames Laboratory-Iowa State University Site.

Effective Dose Equivalent: For dep. Uranium,	6.34×10^{-8} mrem/yr (6.34×10^{-10} mSv/yr)
For U-234,	1.43×10^{-9} mrem/yr (1.43×10^{-11} mSv/yr)

The standard for air emissions found in 40 CFR 61.92 states that emissions of radionuclides to ambient air from a DOE facility "shall not exceed those amounts that would cause any member of the public to receive in any year an effective dose equivalent of 10 mrem/yr" (0.1 mSv/yr). The Laboratory is in compliance with the stated standard.

6.0 ENVIRONMENTAL NON-RADIOLOGICAL PROGRAM

6.1 Chemical Waste Effluent Data

Sanitary sewage effluents are currently not being monitored by the Lab for the presence of chemical wastes. The City of Ames and ISU have a monitoring agreement.

6.2 Environmental Sampling

Monitoring well, test well and creek samples from the chemical burial site were analyzed for elements known to be buried and for cyanide. Comparison of results from the reference well, test wells and creek samples shows that migration of wastes is not evident. See Table 5-1.

Soil and groundwater samples have been collected from several of the inactive waste sites in early 1993. Analytical results are pending.

6.3 Other Emissions

AL is in compliance with NESHAP reporting requirements, 40 CFR 61 (8), Subpart H. A report was submitted to CH 02-17-93. Both an air monitoring and a groundwater protection program are required by the Ames Laboratory Tiger Team Corrective Action Plan. Both programs are in the planning stage.

6.4 Continuous Release Reporting

Ames Lab has no continuous release sources.

6.5 Environmental Occurrences

There was a five gallon diesel fuel spill at the administrative office building construction site. The spill was reported to Iowa DNR per 567 IAC 131 requirements. The spill was properly cleaned up immediately.

6.6 SARA Title III Reporting Requirements

There are no chemicals stocked at Ames Lab above the total planning quantity (TPQ). There is one cylinder for hydrogen fluoride, HF, whose total capacity matches the TPQ of 100 pounds. However this cylinder was never full in 1992.

7.0 GROUNDWATER.

A program for monitoring the emergency generator underground fuel tank for diesel fuel leakage is conducted by the Laboratory as required by the Iowa Administrative Code, Chapter 135. The program consists of sampling ground water from two test wells at the tank site, once each month. Water samples are examined for the presence of diesel fuel using a vapor detection method (odor) and visually. No odors or sheens were detected in 1992. Evidence of a leaking tank will be reported to the Iowa DNR. Corrective action, consisting of tank and content removal, would then be taken. No leaks have been observed to date. The emergency generator diesel fuel tank will be removed in the summer of 1994. It will be replaced by an above-ground tank. The tank is located between Wilhelm Hall and the Physics Addition on the ISU campus. See Figure 4.

The closed chemical disposal site is monitored by a system of nine onsite monitoring wells. One of these nine is an upgradient well. There is another upgradient well (separate from the nine) just west of the site. See Figures 5 and 7, and Table 5-1.

During the investigation of the nine inactive waste sites, several borings to groundwater will be made. The groundwater will be sampled and analyzed for uranium, thorium, gross alpha activity, gross beta activity, and hexavalent chromium.

A groundwater protection plan and monitoring program are in the planning phase. Suitable monitoring sites have been located among existing Ames Lab, ISU and City of Ames wells.

8.0 QUALITY ASSURANCE PROGRAM

The Ames Laboratory has a Quality Assurance Program. Elements of the program which involve measurement of radioactivity are the responsibility of the Environment, Safety and Health Group. Radioactive sources and solutions that are used for calibration of radiation detection instrumentation are obtained with quantitative calibration that is directly traceable to the National Institute of Standards and Technology. The Laboratory also participates in a DOE Quality Assessment Program designed to test the quality of the environmental measurements being reported to the DOE. The program includes testing of water, soil, vegetation and air filter samples.

9.0 REFERENCES

1. DOE Order #548.1, "Effluent and Environmental Monitoring Program Requirements."
2. DOE Order #5484.1, "Environmental Protection, Safety, and Health Protection Information Reporting Requirements."
3. DOE Order #5400.1, "General Environmental Protection Program."
4. DOE Order #5480.14, "Comprehensive Environmental Response, Compensation, and Liability Act Program."
5. 40 CFR Part 192, "Health and Environmental Protection Standards for Uranium and Thorium Mill Tailings."
6. Iowa Administrative Code, Chapter 135, "Underground Storage Tanks."
7. Iowa Administrative Code, Chapter 23, "Emission Standards for Contaminants."
8. 40 CFR Part 61, "Clean Air Act."

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