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FILE: Environmental Science Branch, Monthly Rpts. 1966-70

SUBJECT: Activities of Environmental Branch

February 21 - March 21, 1970

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ACTIVITIES OF ENVIRONMENTAL BRANCH, FEBRUARY 21 - MARCH 20, 1970

Environmental Monitoring

NRPS

The average on- and off-site air concentrations of filterable gross alpha and beta radioactivity and iodine-131 for February were as follows:

	Alpha	Beta	Iodine-131
On-site	0.0018 pCi/m ³	0.684 pCi/m ³	0.0035 pCi/m ³
Off-site	0.006 pCi/m ³	0.311 pCi/m ³	0.0032 pCi/m ³

All the above concentrations were less than 10% of the CG values for uncontrolled areas with the exception of the off-site alpha which is 30% of the CG values for uncontrolled areas. The higher gross beta concentrations on-site can be attributed to CPP operations. The higher off-site alpha concentrations are due mainly to activity detected in the Pocatello area. In-plant samples from FMC and J. R. Simplot Companies were collected by the Idaho Department of Health and submitted to HSL for analysis. A report summarizing our findings to date covering both in-plant and environmental sampling is being prepared. Recommendation of the Laboratory's future involvement will be included.

The monthly average gross alpha concentrations for off-site locations are shown in pCi/m³ as follows:

IF Hqts	0.0024	Butte City	0.0011
IF Airport	0.0026	Pocatello Fire Station	0.0101
Blackfoot	0.0031	Pocatello Sewage Plant	0.0217
Arco	0.0016	American Falls	0.0056

The average concentrations of particulate material in on-site surface air for February was 20.0 ug/m³ compared to 73.5 ug/m³ for off-site locations.

The average on-site ground water concentration for gross alpha, beta and tritium activity for February were less than 6% of their respective CG values for drinking water.

Fourteen milk samples were collected and analyzed for iodine-131 and cesium-137 during February. All samples showed concentrations less than 20% and 0.3% of their respective CG values.

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Emergency Response

Trailer City was set up at Test Grid 3 for use in the planned EXCES releases. Familiarization and practice in the actual use of Trailer City will enhance the emergency response capabilities for Environmental Branch personnel.

Independent Measurements Program

Report No. 7 for Nuclear Fuel Services - New York (July-September, 1969) was finalized and will be sent to CO:HQ as soon as the necessary number of copies are reproduced.

Report No. 3 for Nuclear Fuel Services - Erwin, Tennessee (July-October, 1969) was drafted and is now being circulated for comments.

Report No. 2 for Humboldt Bay (August-November, 1969) is being written. CO:V is going to submit oyster samples from west coast locations other than Humboldt Bay for analyses. Data from these samples will be used to determine concentrations of fallout and naturally occurring radioactivity in the west coast oysters. At the request of CO:HQ, one set of soil samples is going to be collected from the Humboldt Bay power plant and sent to HSL for fission product analysis. CO:V was advised of our recommended soil sampling procedures. Upon our recommendation in Report No. 1 for Humboldt Bay, the drinking water sampling frequency has been reduced from weekly to monthly.

The Indian Point survey will be initiated as soon as contract arrangements between the AEC and the sample collection man are finalized. The air samplers were prepared for shipment to Indian Point.

After a letter was sent to CO:III recommending termination of the Dresden TLD program, CO:III advised that they wished it continued since Dresden II was about to begin operation. The present set of badges at Dresden will remain in place for an additional two months, during which time efforts will be made to have the Dresden TLD program funded through the Independent Measurements Program. Efforts are also being made to have a pre-operational TLD survey at Northern States Power's Monticello Reactor funded by the Independent Measurements Program.

CO:HQ is planning to take one set of soil samples at several or all facilities in the U. S. licensed to handle plutonium. The HSL has been requested to analyze these samples for plutonium. Recommended soil sampling procedures were relayed to CO:HQ and special soil sampling tools were constructed.

Waste Management

Research

The latest tritium analysis of the aluminum hydroxide precipitates indicated no appreciable difference between the tritium concentration of the "bound" water of the precipitates and that of the "free" water. More determinations will be made to substantiate the above findings.

Testing of the tritium sampler at ICPP resulted in obtaining an efficiency of 74.7% for collection with an air flow rate of 0.5 cubic feet per hour. The ICPP Health Physics group is using some of our tritium samplers to sample air released during fuel processing.

Documents Reviewed

LOFT SDD 1.3.1 (preliminary) - "Water Supply and Fire Protection System".

General

The Section has continued to work on reports, waste data, manual chapter revisions and items concerning operational waste disposals. Two reports have been distributed in draft form for comments: History of Waste Management at the NRTS and Radionuclide Distribution in the Regolith as a Result of Waste Disposal at the NRTS. The ID Manual Chapter 0510 is being revised for Liquid, Chemical, Airborne and Solid Waste. A final copy of an INC study (CI-1173), Feasibility of Water Reuse at the NRTS Test Reactor Area should be received soon. The first draft of the report, "Permeability and Exchange Properties of Soil in the Vicinity of LOFT", is being completed. The draft on the waste disposal data is being completed.

Environmental Studies Section

Controlled Environmental Release Test (CERT) Program:

- (a) Part of the equipment ordered for the modification of the environmental chamber has been received. Fabrication of the parts of the turbulence generator was completed by INC. Four radiiodine generators for the environmental chamber were received from the CPP glass shop.
- (b) Grass flats were placed in the environmental chamber and necessary access ports drilled for hot-wire anemometer measurements in the environmental chamber. Photographs of the chamber and of the instrumentation and control.

- (c) A paper on the new chamber is being prepared for the annual meeting of the Institute of Environmental Sciences in Boston, Massachusetts on April 23, 1970.
- (d) Additional data on the effect relative humidity on stomatal opening were gathered for inclusion in the paper "Effects of Stomatal Opening on the Transfer of $^{131}\text{I}_2$ from Air to Grass" which is in the final draft stage.
- (e) The contract for operation of the Experimental Dairy Farm has been prepared and bids are being solicited.

Experimental Cloud Exposure Study (EXCES):

- (a) Two build-up factor tests using the Tm-170 source were attempted with the source and dosimeters supported by a balloon. High winds resulted in the loss of two balloons and one set of dosimeters. Four auger anchors were obtained at the suggestion of OS&TS. Two more sources will be produced in the ATR for the build-up factor test series.
- (b) Sources of ^{24}Na are being prepared routinely in the MTR for use in the EXCES field release tests. The meteorological conditions have not been acceptable for a field test on any of the 6 potential test days since March 10. Instrumentation difficulties have also been encountered.

Other (Routine):

- (a) The regular weekly and monthly smear and radiation surveys of AEC facilities at the NRES were completed.
- (b) Disposal of HSL radioactive waste and laundering of anti-contamination clothing were arranged as required.

Other (Non-routine):

- (a) Preparation for the study of the uptake of plutonium by plants grown in contaminated soil are continuing
- (b) The efficiency of AC-1 filters for collection of Hg-203 was determined for the field sampling rate of 30 liters/minute. The average efficiency for three tests was 28%. Two AC-1 filters collected 44% when run in series; five AC-1 filters in series collected 99% of the released Hg-203. An experiment to determine the amount of Hg-203 lost from a contaminated filter run for 7 days at the field sampling rate revealed that virtually no Hg-203 was lost.

- (c) Contractor health physics offices were notified that 5 instruments sent to CF-690 for repair were found to be contaminated (ICPP-4, TRA-1).
- (d) Special surveys of 3 incoming shipments of materials composed of or contaminated with Am-241 were made. Special monitoring of Analytical Chemistry personnel and equipment in Room 121 during examination of these samples was performed.
- (e) Spot checks of emergency kits showed the instruments to be in satisfactory condition.
- (f) Reviews of LOFT SDD documents were performed as requested.

U. S. Geological Survey

See attached report.

ESSA-ARLFRO - Environmental Sciences Services Administration

See attached report.

Charles A. Pelletier, Chief
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Enclosure:

- 1. USGS Report
- 2. ESSA Report

cc: John R. HOran
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