

UNITED STATES
ATOMIC ENERGY COMMISSION
WASHINGTON, D.C. 20545

MAR 2 1970

Harold L. Price
Director of Regulation

INDEPENDENT MEASUREMENTS PROGRAM - NUCLEAR FUEL SERVICES, INC.,
ERWIN, TENNESSEE

Enclosed for your information are the first two reports on the results of the Independent Measurements Program for the Nuclear Fuel Services, Inc., fuel facility near Erwin, Tennessee. These reports contain data for samples and measurements made during the periods from July 1968 through March 1969 and April through June 1969, respectively. The program was fully implemented in November 1968 when continuous air sampling was started at three locations in the unrestricted areas around the site.

Our preliminary evaluation of the data is as follows:

a. Air

The airborne alpha activity levels at the two air sampling stations nearest the site (about 1000' NE of the site boundary and about 500' east of the site boundary, respectively) were consistently higher than those measured in continuous samples collected at the background station five miles upwind of the site. The highest average net alpha activity concentration at either of these stations was 0.3% of the 10 CFR 20 unrestricted area limit for enriched uranium. The average beta activity levels in the samples did not vary significantly from the levels measured at the background station located five miles upwind of the site.

b. Surface Water

All discharges of contaminated liquid wastes from the site are via hold-up pond #2 (lower pond) into Banner Spring Creek onsite which empties into Martin's Creek near the licensee's property boundary. Martin's Creek flows into the Nolichucky River about 400' offsite.

The offsite average net alpha concentrations in the Nolichucky River for the entire period covered by the reports were less than 1% of applicable unrestricted area limits. There were no gross beta activity levels above the background levels measured in samples collected upstream of the site in the Nolichucky River.

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Grab samples collected from Martin's Creek during the period covered by the enclosed reports showed an average net alpha activity of about 2% of 10 CFR 20 unrestricted area limits for enriched uranium for the last half of 1968 and of 0.6% for the first half of 1969. Thorium is the most limiting isotope present in the liquid wastes, but is processed under a Tennessee State license. Assuming that the gross alpha activity levels in Martin's Creek were due to natural thorium, those levels were about 67% of the unrestricted area thorium limit during the last half of 1968 and about 18% during the first half of 1969. p u ?
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Three water samples collected onsite during the report period showed the unexpected presence of strontium 90, the highest concentration of which was about 9% of the 10 CFR 20 restricted area limit for this nuclide. One sediment sample from Banner Spring Creek also showed the presence of strontium 90, although there were no measurable concentrations of this nuclide in the water samples from that stream. We have concluded that the most likely origin of the strontium 90 found in the onsite samples was a contaminated shipment of scrap. The licensee has been informed of our survey findings in this regard and has instituted survey procedures to identify such shipments in the future. Our findings have also been transmitted to the Tennessee State Health Department (Tennessee is an Agreement State) which has jurisdiction over the source and byproduct materials used at this site.

c. Soil and Vegetation

Quarterly soil and vegetation samples were collected in the program at the plant site perimeter and at distances of 1000', one mile, and five miles from the site. The specific activity of the perimeter samples was about ten times higher than any sample taken at the more distant locations. In the spring of 1969, the licensee expanded his restricted area to about double its previous size, so that the areas showing higher activity levels are now completely within the restricted area. The new fence locations are shown in the attached drawing as solid lines and the former locations are shown as dotted lines.

d. Drinking Water

Samples of the NFS fresh water supply and the drinking water supplies for most of the City of Erwin showed concentration levels at or below the minimum detection limits for the analytical procedures for gross alpha, beta, and gamma activity. Analyses were also made of gross alpha, beta, and gamma activity levels in samples of the outflow

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from Banner Spring, with comparable results as for the other drinking water supplies. The Clinchfield Railroad Company utilizes this spring as its fresh water supply. There was no evidence of contamination of these water supplies by plant operations.

e. External Radiation Dose

Thermoluminescent Dosimeters (TLD's) are used for dose monitoring on all four sides of the plant restricted area boundary and at the air monitoring station east of the site boundary. A summary of the doses measured at the various stations during 1968 and the first half of 1969 are shown in Section H, Enclosure 2.

The highest dose measured at the unrestricted area boundary was on the east side of the plant and was 2,380 mrad for the period from January 9 to March 11, 1969. Investigation by the Division of Compliance of the conditions creating these dose rates showed that the dosimeters had been placed in close proximity to a number of waste storage drums located within the restricted area. The licensee was cited for creating excessive levels of radiation in an unrestricted area. Corrective action taken by the licensee included removal of the wastes to a new storage building and expansion of the restricted area boundaries, as shown in the attached drawing. These actions resulted in a reduction of the dose rates to less than the 2 millirems/hr and 100 millirems/wk limit contained in paragraph 20.105(b) of 10 CFR 20, as shown by TLD measurements made during the second quarter of 1969.

We plan to transmit copies of the enclosed reports, without the above evaluation, to the Tennessee State Health Department, U. S. Public Health Service, and the licensee.


Lawrence D. Low, Director
Division of Compliance

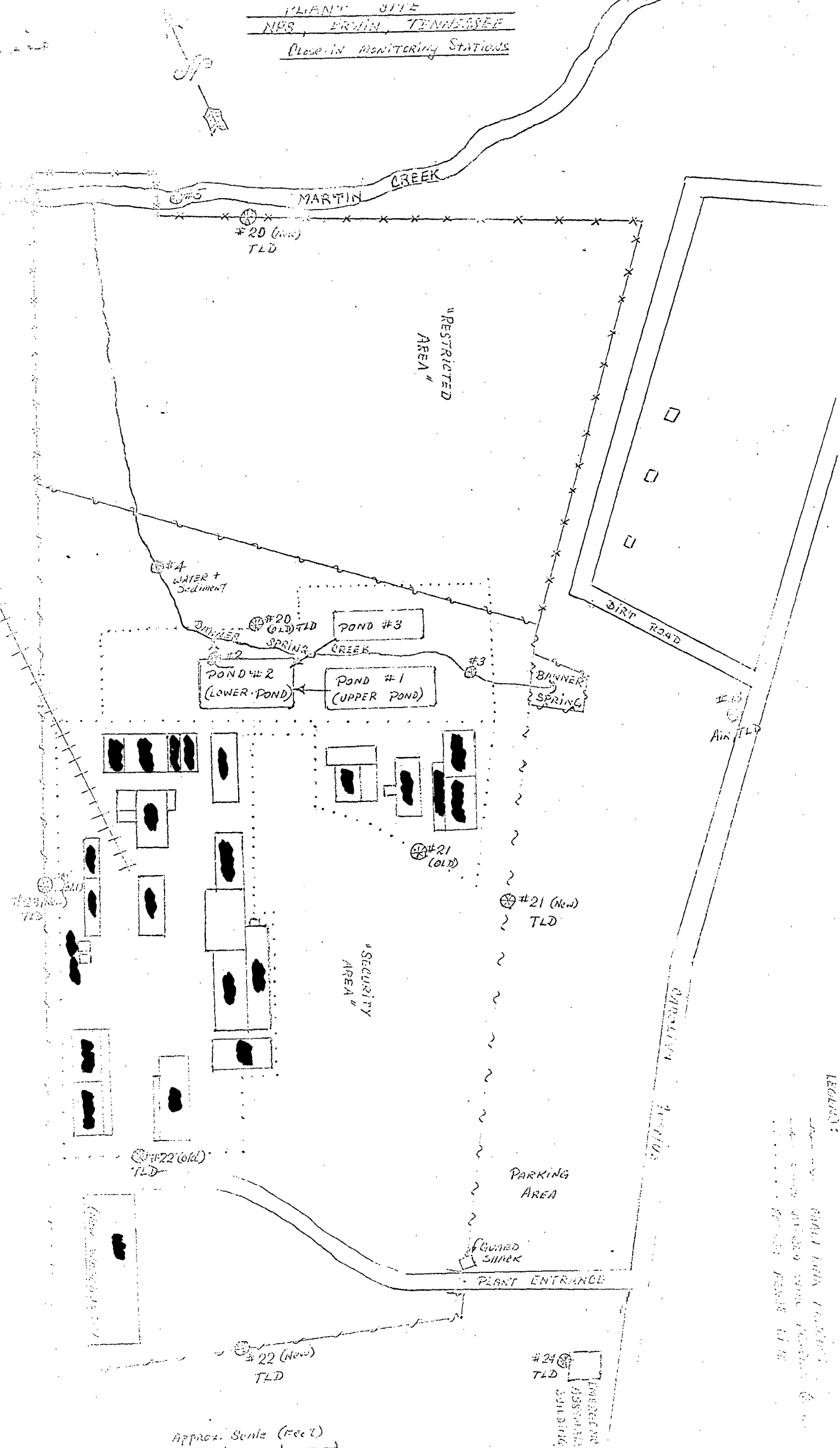
Enclosures:

1. IMP for NFS (Erwin), July 1968-March 1969
2. IMP for NFS (Erwin), April-June 1969

cc w/encls:

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PLANT SITE
NPS, FRANK, TENNESSEE
CLOSE-IN MONITORING STATIONS



LEGEND:

--- CARROLLA SECTION ---
 --- DIRT ROAD ---
 --- PLANT ENTRANCE ---
 --- GUARD SHACK ---
 --- PARKING AREA ---
 --- SECURITY AREA ---
 --- RESTRICTED AREA ---

Approx. Scale (Feet)