U.S. NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT

Region I

Report No. 79-03

Docket No. 40-7983
30-3867

License No. SUB-972
07-03860-04 Priority IV Category E

Licensee: NL Industries

Foot of West Street

Wilmington, Delaware 19801

Facility Name: NL Industries

Inspection at: Wilmington, Delaware

Inspection conducted: June 26, 1979

Inspectors: Robert O McClintock 7/30/79
for J. Costello, Radiation Specialist date signed

John E. Glenn 7/30/79
J. Glenn, Radiation Specialist date signed

date signed

Approved by: Robert O McClintock 7/30/79
R. O. McClintock, Chief, Materials Radiological Protection Section, FF&MS Branch date signed

Inspection Summary:

Inspection on June 26, 1979 (Combined Report No. 30-3867/79-03 and 40-7983/79-03)

Areas Inspected: Special, announced inspection including: decontamination of property, fixed and removable contamination survey, soil sampling and water sampling. The inspection involved 9 inspector-hours on site by two NRC regional based inspectors.

Results: Region I recommends that this property be released for unrestricted use.

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DETAILS

1. Persons Contacted

D. Leigh - Nuclear Division Health and Safety Officer

2. Decontamination of Property

The licensee was authorized by licenses SUB-972 and 07-03860-04 to fabricate and maintain shipping casks containing depleted uranium. From August 1978 to April 1979, the licensee employed the Chem-Nuclear Corporation to survey and decontaminate the work shop complex and surrounding grounds.

In April, 1979, a survey of the facility was submitted to the License Management Branch with a request that this facility be released for unrestricted use. Additional survey information was submitted by the licensee in May, 1979.

During the decontamination work, the regional office made several inspections, including making independent measurements, which monitored the progress of the decontamination. The current inspection was to verify the licensee's surveys and determine if the site meets the criteria for release for unrestricted use. The licensee intends to maintain the licenses and currently stores licensed material in a building adjacent to the property. The licensee leases this building and plans to use it for storage only.

The waste material generated during the decontamination was sent by Chem-Nuclear to their waste burial facility in Barnwell, South Carolina.

3. Fixed and Removable Contamination Survey

On June 26, 1979 the inspectors took wipe surveys of assessible surfaces in the main building at the licensee's facility. These wipes were later analyzed at the Regional office Laboratory. No detectable removable contamination was observed using a low-background gas flow proportional counter.

The inspectors also made a survey of the fixed contamination levels in the building. They used an alpha scintillation detector, Eberline Model PAC-15A, a gamma scintillation detector, Ludlum Model 16, and an end window G-M Eberline Model E-120, Fixed alpha contamination varying from 500 dpm/100 cm^2 to 3000 dpm/100 cm^2 was observed. These results are within the guidelines for fixed uranium contamination established by the 1975 draft of the Guidelines for Decontamination of Facilities and Equipment Prior to Release for Unrestricted Use.

4. Soil Sampling

The inspectors took soil samples at locations where radiation levels in excess of background were detected with a gamma scintillation detector. These samples were analyzed using the NRC Mobile Laboratory GeLi gamma spectroscopy system. The results are as follows:

Location	Isotope	Concentration (PICOCURIES/GM)
1. Trench near decon pad.	U-238	11.0
	Cs-137	15.0
	Co-60	3.9
2. Trench in lunch room.	U-238	9.2
	Cs-137	1.2
	Co-60	3.2
3. Hole inside radiographic shield area.	U-238	16.0
	Cs-137	$<$ 0.3
	Co-60	$<$ 0.3
4. Hole outside radiographic shield area.	U-238	$<$ 0.3
	Cs-137	$<$ 0.3
	Co-60	10.1
5. Old dock area	U-238	$<$ 1
	Cs-137	$<$ 0.3
	Co-60	13
6. Along river near sump	U-238	$<$ 1
	Cs-137	$<$ 0.3
	Co-60	1.7

	Isotope	Concentration (PICOCURIES/GM)
7. Ditch by river - opposite lunch room	U-238	< 1
	Cs-137	1.7
	Co-60	11
8. Flagpole area	U-238	< 1
	Cs-137	< 0.3
	Co-60	1.1
9. Railroad Tracks	U-238	< 1
	Cs-137	< 0.3
	Co-60	2900 (See next paragraph)
10. Trench near pipe junction failure	U-238	< 1
	Cs-137	0.8
	Co-60	3.9

Sample 9 represents a single piece of contaminated material containing 2 uCi of Co-60 which was found in the soil sample. After the sample was taken, there was no detectable radioactivity remaining in this area.

5. Water Sampling

Water samples were obtained from the Christiana River alongside the old dock and from the sump which is connected to the Wilmington city sewer. These samples were evaluated at the Regional Office Mobile Laboratory using a GeLi gamma spectroscopy system. Neither sample indicated the presence of measureable levels of radioactivity. The minimum detectable activity is 7.8×10^{-7} uCi/ml for Cs-137 and 8.8×10^{-7} uCi/ml for Co-60.

6. Evaluation by the Regional Office

The regional office has reviewed the results of the licensee's surveys and has verified these results with independent measurements. The radiation and contamination levels remaining meet the criteria established by the 1975 draft of the Guidelines for Decontamination of Facilities and Equipment Prior to Release for Unrestricted Use or Termination of Licenses for Byproduct, Source, on Special Nuclear Material.

The soil contamination concentrations are such that they meet the Table II Column 2 concentrations replacing milliliters of water with grams of soil.

One contaminated piece of material containing 2 microcuries was found during the closeout survey; but when this piece was removed, no radioactivity could be detected at that location.