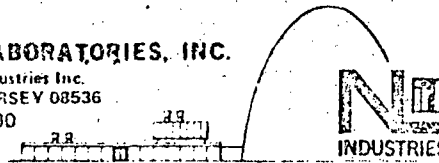


INDUSTRIAL REACTOR LABORATORIES, INC.

Subsidiary of N. L. Industries Inc.
PLAINSBORO, NEW JERSEY 08536
609-799-1800



September 7, 1977

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USNRC - Region 1
Office of Inspection
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631 Park Avenue
King of Prussia, PA 19406

Gentlemen:

Please find enclosed a copy of the latest IRL transmittal to the Radioisotopes Licensing Branch of the USNRC for your information and files.

Very truly yours,

David W. Leigh
Decommissioning Project Manager

DWL/ljl

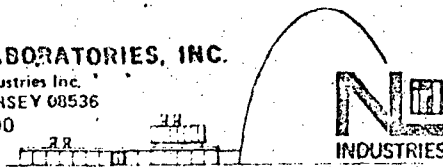
Enclosure

cc: J.L. Jacobs, Esq.
D.G. Maxwell

BH

INDUSTRIAL REACTOR LABORATORIES, INC.

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September 2, 1977

United States
Nuclear Regulatory Commission
Washington, D.C. 20555

Attention: Mr. Bernard Singer, Chief
Radioisotopes Licensing Branch
Division of Fuel Cycle and
Material Safety

Subject: Termination of IRL By-Product
Materials License #29-03686-02;
Justification Concerning the
Leach Field and East Corridor.

Gentlemen:

This letter provides the Commission with information concerning the Leach Field and East Corridor portions of the IRL facility. The information shows that there are no significant health and safety consequences associated with any residual radiation contained at these locations and provides justification for termination of the IRL By-Product Materials License #29-03686-02.

It is our understanding that information as to all other portions of the IRL facility have been satisfactorily supplied to the Commission, as contained particularly in the Final Survey Results After Decontamination, Industrial Reactor Laboratories Facilities, Plainsboro, New Jersey, July 1, 1977.

Section 10.0 of the above IRL report shows the remaining activities in the Leach Field and East Corridor excavation. These estimates set an upper limit to quantities which exist to provide risk source. For the Leach Field, the numbers are as follows:

Co60	0.23mci
Cs134	0.10mci
Cs137	2.13mci
Sr90	0.20mci

For the East Corridor the figures are as follows:

^{60}Co	1.24mci
^{137}Cs	1.91mci
^{134}Cs	0.39mci
^{65}Zn	0.27mci
^{90}Sr	0.22mci
^{54}Mn	0.12mci

Additional figures for the Leach Field are contained on pages 186 and 188 of the IRL report and for the East Corridor excavation on pages 196-197. Section 15 of the IRL report provides estimated doses from hypothetical biological pathways resulting from remaining radioactivity in the South Corridor. That analysis is applicable also to the East Corridor and Leach Field and demonstrates that potential internal and external radiation doses to any individual resulting from any reasonable pathway are very small, so small that they are difficult even to postulate. Doses will certainly be much less than any applicable limits of 10 CFR 20 and less than ALARA Numerical Guidelines in 10 CFR 50. Thus, no risk to man or his environment will endure with respect to the Leach Field and East Corridor.

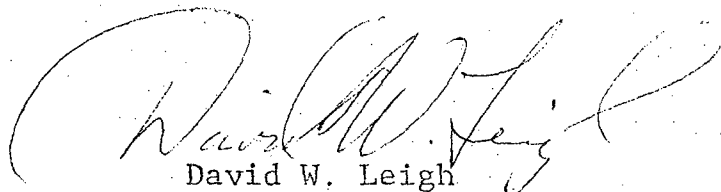
In support of this, it is important to note that potential internal and external doses depend more on the radionuclide concentrations remaining in the soil rather than the total actually remaining in the excavation. The remaining inventory of radioactivity would be of no consequence from an internal or external radiation standpoint. Since photons have a relatively short mean free path in soil so that energy-spatial equilibrium is achieved in a relatively small volume of soil, surface exposure rates relate to average activity concentrations near the surface of the soil. Radioactivity concentrations remaining in the soil will determine equilibrium concentrations in the local ground water as well as concentrations in the nearest site potable water supplied (e.g., the deep wells on the IRL site). Thus, the projected radioactivity concentrations in man who may directly or indirectly use these potable water supplies will be related to the equilibrium concentrations of radionuclides in the ground water and hence the concentrations remaining in the soil rather than the total activity remaining. Since the total activity concentrations of radionuclides in a stagnant water sample from the soil of maximum activity concentrations has been

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Nuclear Regulatory Commission
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shown to be less than the applicable maximum permissible concentration for a mixture for intake over a 50 year period, no potential internal dose water pathway will cause any one individual to exceed applicable internal radiation dose limits. The most likely internal dose pathway involving the use of water from the deep wells on the IRL site has not and will not in the future result in any significant dose. This conclusion is based upon the known ion exchange capacity of the soil and the subsequent delay and decay of radionuclides in migration through the ground water from the leakage point to the deep wells on site. Potential doses via this pathway certainly will be considerably less than the ALARA guidelines indicated in Appendix I of 10 CFR 50.

For these reasons, we submit that there are no health and safety consequences remaining with regard to the Leach Field and East Corridor excavation and that, therefore, there is adequate justification for terminating the license as requested.

Sincerely yours,



David W. Leigh
Decommissioning Project Manager

/ljl