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Department of Energy  
Washington, DC 20585

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FUSRAP 7601  
NY. 8  
NY. 10  
→ NY. 65

JUL 29 1991

Mr. Sam Popowcer, PE  
Senior Project Manager  
BCM Engineers, Inc.  
1 Plymouth Meeting Mall  
Plymouth Meeting, Pennsylvania 19462

Dear Mr. Popowcer:

This is a follow-up letter to our telephone conversation of July 24, 1991. Your company is providing research services to the U.S. Army Corps of Engineers for the Department of Defense former site restoration program. You requested information from the Department of Energy (DOE) concerning the Ashland Site in Tonawanda, New York and the Linde Airproducts Plant on Chandler Street in Buffalo, New York.

The Ashland Site has been designated for remedial action under DOE's Formerly Utilized Sites Remedial Action Program (FUSRAP). The Linde Plant in Tonawanda has also been designated for remedial action under FUSRAP; however, this is a different site than the Chandler Street site in which you expressed an interest. Brief site summaries for both the Ashland and Linde Sites in Tonawanda are enclosed for your information. Mr. William Seay (615-576-1830) of DOE's Field Office in Oak Ridge, Tennessee, is the appropriate contact for further information concerning DOE's site characterization and clean-up activities.

You also expressed an interest in any information DOE might have concerning the Chandler Street site. We are researching this subject and will provide further information when it becomes available.

If you have any questions, please call me at 301-353-8149.

Sincerely,

W. Alexander Williams, PhD  
Designation and Certification Manager  
Off-Site Branch  
Division of Eastern Area Programs  
Office of Environmental Restoration

2 Enclosures

cc:  
W. Seay, OR

bcc:  
Weston  
EM-40 (3)  
EM-42 (3)  
Williams Reader

*WJ*

EM-421:wagoner:djh:353-8147:7/25/91:bcm.waw

Williams *WJ*  
EM-421  
7/28/91  
Wagoner  
EM-421  
7/29/91

LINDE AIR PRODUCTS DIVISION  
UNION CARBIDE CORPORATION  
Tonawanda, New York

### Site Function

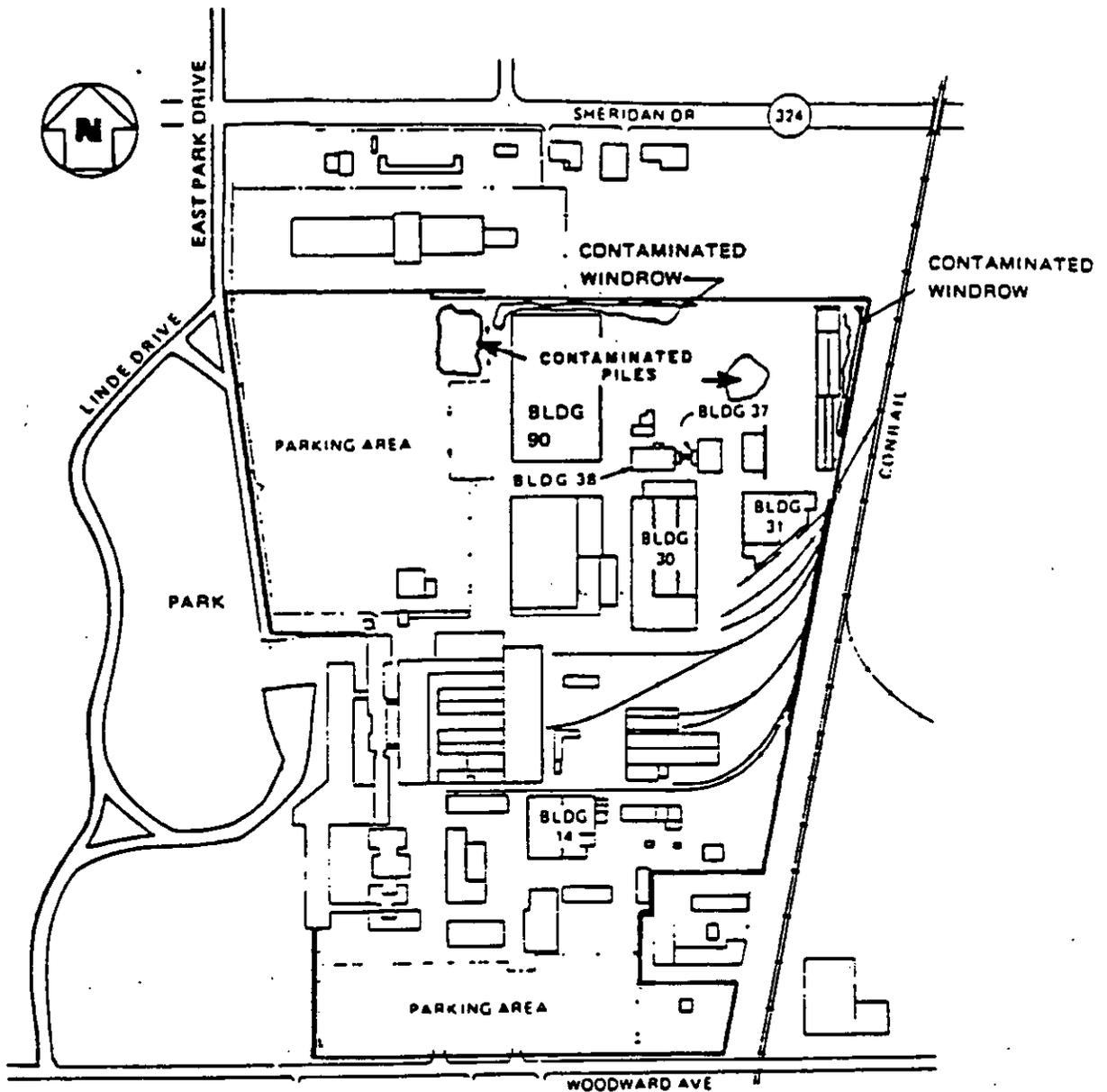
The Linde Air Products Division of Union Carbide operated a plant in Tonawanda, New York, for the Manhattan Engineer District (MED) and the Atomic Energy Commission (AEC) from 1942 through approximately 1948. The facility was known as the Ceramics Plant. Uranium production and some nickel processing were conducted at the site under several contracts, including W-7401-Eng-14. During the first 3 years, pitchblende ore from the Belgian Congo and concentrates from Colorado Plateau ore were converted to black oxide ( $U_3O_8$ ). Residues from the pitchblende processing were stored at a portion of the former Lake Ontario Ordnance Works, now known as the Department of Energy (DOE) Niagara Falls Storage Site. The refinery residues from the domestic ore were moved to the nearby Haist property (now owned by Ashland Oil Company). Some liquid wastes for the refinery operation were disposed of in sanitary sewers, storm sewers, and in shallow on-site wells. The facility also contained a process that converted black oxide into uranium oxide ( $UO_2$ ). It operated at the Ceramics Plant for about 1 year. A separate building (No. 38) housed a third process for converting the uranium oxide to "green salt" (uranium tetrafluoride  $UF_4$ ). This process was used in conjunction with the Electromet Niagara Falls operation during World War II and for the following 2 years.

At the second facility (known as the Chandler Street Plant, Buffalo), Linde developed and produced non-radioactive material for the Oak Ridge Gaseous Diffusion Plant under contract W-26-121-Eng-46.

Other contracts have been identified, but the exact nature of the work involved is unknown: W-7401-Eng-15 (black oxide, October 17, 1942), W-17-028-Eng-29 (ore concentrate, March 4, 1945), and AT(30-1)-GEN-165 (type of material and date unknown).

### Site Description

The Linde Division property in Tonawanda where the ceramics plant was located is bordered on the north and east by other industries; on the south by small businesses, industries, and undeveloped land; and on the west by a golf course. Five buildings (Buildings 14, 30, 31, 37, and 38) were involved in the uranium separation and conversion process (Figure 28). Building 14 (now fabrication facilities, offices, and storage area) was used for small-scale development of the separation process. Black oxide conversion to uranium dioxide was carried out in Building 30 (now a shipping and receiving warehouse). The product from Building 30 was then transferred to Building 38 (currently a warehouse) where



**LEGEND**

- +—+— RAILROAD
- - - FENCE
- SITE BOUNDARY
- ▣ CONTAMINATED BUILDINGS

0 50 100 150 200 250 m

0 200 400 600 800 ft

SOURCE: USGS - BUFFALO, NY QUADRANGLE  
 NEW YORK - ONTARIO, 7.5 MINUTE  
 TOPOGRAPHIC MAP

Figure 28. Linde Site Descriptive Map

fluorination resulted in an end product of uranium tetrafluoride. Buildings 31 and 37 were also used in these operations. Building 37 is not being used currently.

### Owner History

This facility is owned by the Linde Air Products Division of the Union Carbide Corporation. Union Carbide constructed Building 14 in the mid-1930's. MED constructed four buildings (30, 31, 37, and 38) on land owned by Union Carbide. The buildings were transferred to Linde upon termination of the AEC contract.

### Radiological History and Status

To determine the radiological status of the portions of the Linde facility used for MED/AEC operations, a survey was performed by Oak Ridge National Laboratory (ORNL) personnel from October 18 through November 5, 1976. The results of the survey showed that surface contamination was present in Buildings 14, 30, 37, and 38. As part of this survey, on-site soil samples were collected. Some of the samples contained concentrations of uranium-238 and actinium-227 exceeding background. ORNL made attempts to obtain samples from the wells used for waste disposal; however, the wells were plugged below the surface.

On July 27, 1977, the Department of Energy, then the Energy Research and Development Administration, held a meeting at the Linde Plant to discuss the findings of the radiological survey of the site with company and State regulatory officials. As a result of the meeting, the Linde Air Products Division made application for amendment to its New York State license 1983-0143 to cover the contaminated buildings. The amendment was approved by New York State.

EG&G, Inc., conducted aerial surveys of the Tonawanda area in November 1978 and September 1979. Elevated radiation levels were noted on the Linde property, although higher levels were discovered on the nearby Ashland Oil Corporation (formerly Haist) property and Seaway Industrial Park.

The results of a June 1981 survey by Oak Ridge Associated Universities (March to April 1981), analyses of well water samples by Argonne National Laboratory, and historical data indicate that contamination is present in the disposal wells and that the uranium and radium constituents are largely insoluble. The analysis determined that the contamination posed no significant risk to workers or the general public under current use conditions. Ford, Bacon and Davis Utah Inc., conducted a supplementary survey in June 1981 in conjunction with its preliminary evaluation of the engineering and environmental aspects of the remedial action alternatives. The resulting data supported the ORNL survey results

and provided better definition of the contamination limits. Bechtel National, Inc., prepared a supplementary engineering evaluation in November 1982.

The Linde site is included in the Tonawanda integrated Remedial Investigation/Feasibility Study - Environmental Assessment (RI/FS-EA) process to comply with requirements of NEPA and CERCLA/SARA. The assessment process is ongoing, with completion of the Work Plan due in early Fiscal Year 1991.

In Fiscal Years 1988 and 1989, field work was performed at the Linde site to establish contamination boundaries and provided data on chemical and radioactive constituents. Completion of the project is currently scheduled for Fiscal Year 1994, subject to the selection and development of a permanent disposal site.

ASHLAND OIL COMPANY  
Property No. I (The Former Haist Property)  
and Property No. II  
Tonawanda, New York

### Site Function

The former Haist property was used by the Manhattan Engineer District (MED) from 1943 to 1946 for uranium residue storage. The residues were generated by Linde Air Products (Division of Union Carbide Corporation) during Linde's participation in the refinery program of the MED project. The residues were maintained by MED and later the Atomic Energy Commission (AEC) as potential sources of uranium.

### Site Description

The 10.8-acre site is currently part of the Ashland Oil Company refinery in Tonawanda, New York (Figure 24). It contains an electrical switchyard and fuel gas distribution building and storage tanks. The area is used infrequently by workers. An associated contaminated location (Ashland No. II) is in an overgrown, undeveloped area of the Ashland property.

The residues on the Haist property consist essentially of low-grade uranium residues. About 16 million pounds (dry weight) of residues containing approximately 0.54 percent uranium were spread out over roughly two-thirds of the site to a depth of 1 to 5 feet.

### Owner History

MED leased the property on June 25, 1943, and purchased it from L. H. Wood, K. F. Russell, E. Haist, R. Haist, and H. Haist on August 21, 1944. A perpetual easement for access (4.6 acres) was also purchased with the land. After AEC exceded this property in 1949, it was controlled by the General Services Administration (GSA) until 1960. The property remained undeveloped until GSA sold it to Ashland Oil in June 1960. Ashland Oil subsequently built storage tanks on the site, which is adjacent to the company's petroleum refinery.

### Radiological History and Status

The site was surveyed and evaluated by AEC in October 1957. As a result, the property was released for use without radiological restrictions. In 1974, Ashland transported an estimated 6,000 cubic feet of the residues at this site to the Seaway Industrial Park. Also, at some unknown time, a quantity of residue was transported to another Ashland property north of Seaway, referred to as Ashland No. II.

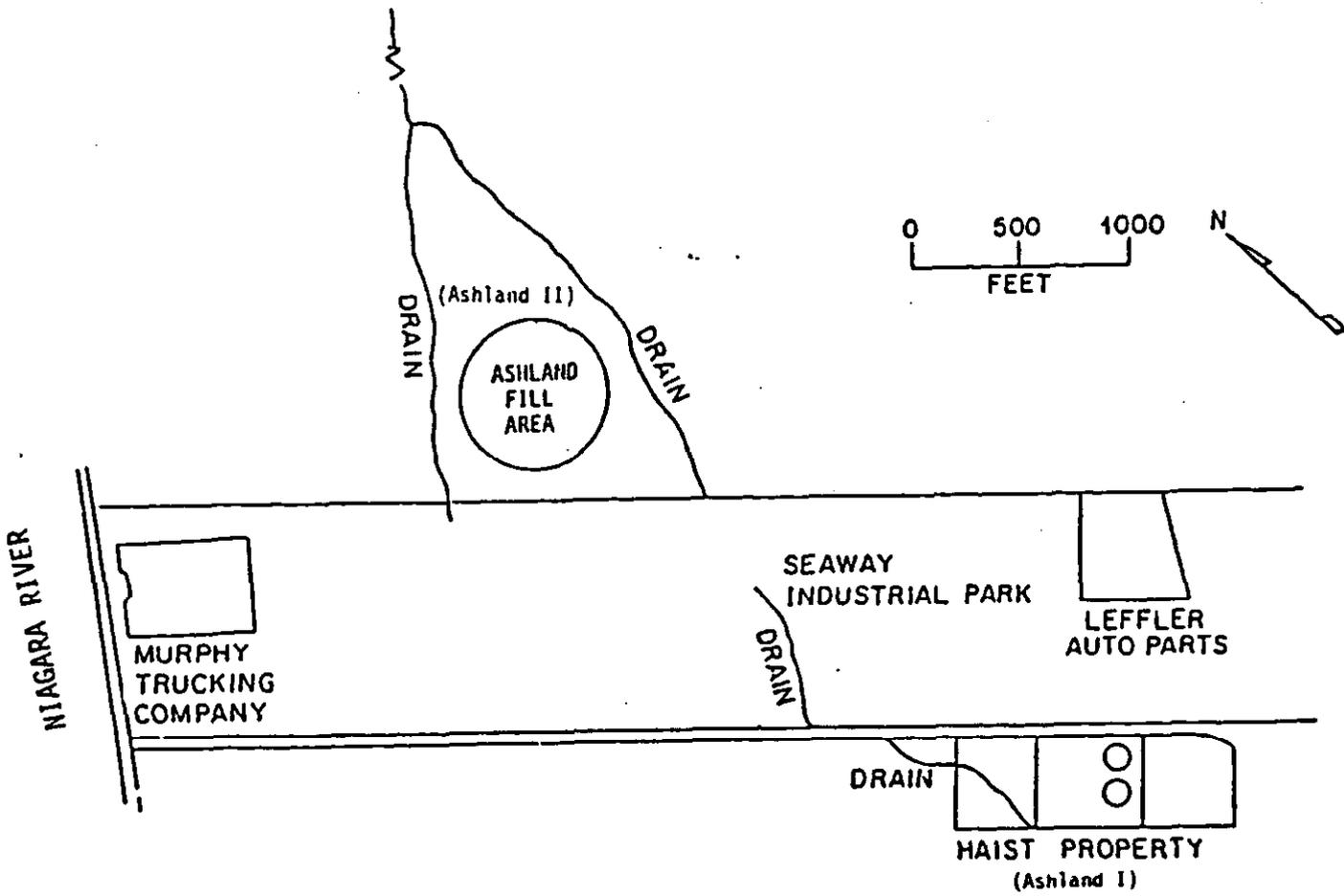


Figure 24. Contaminated Portions of Ashland Oil Company Property, Tonawanda, New York

During the period from July 7 through August 6, 1976, Oak Ridge National Laboratory conducted a radiological survey of the site. The survey indicated that the residues on the site "do not pose an immediate health hazard assuming that the residues remain in place... and that the site continues to be used in the manner in which it is presently used."

The average gamma radiation at the site would not result in exposures that would exceed Department of Energy exposure limits.<sup>35</sup>

However, continuous exposure to the average levels over a 5,400-square-meter area in the northwest portion of the site would exceed the guideline by a factor of 2. Radium concentrations in the soil throughout the site exceeded the residual contamination criteria.<sup>35</sup>

EG&G, Inc., conducted an aerial survey over Tonawanda for the Department of Energy in September 1979. The aerial survey results were in agreement with the ground surveys. Elevated radiation levels were confirmed on the former Haist property and Seaway site. In addition, elevated levels were observed on the Ashland No. II property. This radiation also appears to be derived from MED/AEC residue removed from the Haist property; however, additional surveys will be required.

Based on the radiological survey data and an authority review, the Ashland sites have been authorized for remedial action under the Formerly Utilized Sites Remedial Action Program. Site characterization began in 1987, and continued into Fiscal Year 1989. Field work was performed to establish contamination boundaries and provide data on chemical and radioactive constituents. The Ashland 1 and Ashland 2 sites are included in the Tonawanda integrated Remedial Investigation/Feasibility Study - Environmental Assessment (RI/FS-EA) process to comply with requirements of NEPA and CERCLA. Remedial action is currently planned through Fiscal Year 1996, subject to the selection and development of a final disposal site.

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<sup>35</sup> U.S. Department of Energy Guidelines for Residual Radioactivity at Formerly Utilized Sites Remedial Action Program and Remote Surplus Facilities Management Program Sites, Rev. 1, July 1985.