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REVISED ADM FOR NFSS NONACCELERATED PROGRAM

Attached is a slightly revised version of the final ADM for the nonaccelerated program work initiatives per HQ instructions.

Work continues on the supplemental ADM for the accelerated case initiatives. The EIS scoping input received from the Town of Lewiston's attorney (copy of letter attached) would suggest that appropriate administrative action by HQ to resolve the NEPA aspects of the interim work should be expedited.

Lowell F. Campbell
L. F. Campbell, Deputy Director
Technical Services Division

CE-53:JKA

Attachments:
As stated

R. L. Rud

# ACTION DESCRIPTION MEMORANDUM

# NIAGARA FALLS STORAGE SITE

# PROPOSED INTERIM REMEDIAL ACTIONS

# FOR FY 1983

# (NONACCELERATED PROGRAM)

Prepared by

Division of Environmental Impact Studies
Argonne National Laboratory
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First Draft: September 1982
Final: February 1983

Prepared for

U.S. Department of Energy
Oak Ridge Operations
Technical Services Division
Oak Ridge, Tennessee

# CONTENTS

SUBJECT: Proposed FY 1983 Interim Remedial Actions at the Niagara Falls Storage Site*

SUMMARY OF PROPOSED ACTION AND RELATED ACTIVITIES

As part of its Surplus Facilities Management Program (SFMP) and Formerly Utilized Sites Remedial Action Program (FUSRAP), the U.S. Department of Energy (DOE), Oak Ridge Operations Office, proposes to carry out an interim remedial action project in FY 1983 at the Department's Niagara Falls Storage Site (NFSS) in Niagara County, Lewiston Township, New York (Figure 1). The project will involve reconsolidation, stabilization, and other control measures for various radioactive residues and contaminated materials located on the site and in drainage ditches. Specific project actions include:*

- Clearing and grubbing of trees and brush from portions of the site, from the west and central drainage ditches (onsite and offsite) and along the site perimeter fence.
- Excavation from the cleared areas of sediments and soil materials that have a radium-226 concentration in excess of 15 pCi/g above background. The excavated materials will be placed within an existing diked area (R-10 pile) on the site. Uncontaminated fill materials will be placed in the excavated areas to reestablish proper drainage grade.
- Transfer of uranium ore-processing residues (Middlesex sands) stored in Building 410 to either the R-10 pile diked area or the basement of Building 410.
- Partial dewatering and construction of a multilayer cover system over the residues currently stored in Building 411.
- Demolition of Building 410.

Details of these activities are given in the section "Proposed Action and Alternatives."

This work will be a continuation of interim remedial work begun in 1982 as part of DOE's ongoing maintenance and caretaker operations at NFSS. The 1982 remedial action consisted of: (1) reconsolidation and stabilization of the R-10 pile of radioactive residues, (2) construction of a dike and subsurface, clay cutoff wall (trench) around the R-10 pile, (3) removal of wooden roofs and construction of a multilayer cover system over radioactive residues

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*Plans for remedial actions at NFSS have been accelerated. Preliminary engineering is underway for several additional FY 1983 interim actions. A supplemental ADM will be prepared when sufficient details become available regarding the additional actions.

result, most of the residues are now under water, and radon levels in the air above the residues have been reduced from about 24 WL (working level) to 1 WL (Bechtel Natl. Inc. 1983). Prior to the 1982 work, about 3,000-3,500 $m^3$ (790,000-920,000 gal) of water covered portions of the residues. Efforts were taken in 1982 to determine the concentrations of radionuclides and heavy metals in this water, but the results have not yet been published. The source of the water has been largely attributed to precipitation that enters the building through the leaky roof, although connections to other buildings (which were disconnected in 1980 and 1982) may be an additional source of water (Ausmus et al. 1980).

Building 410 currently contains about 175 $m^3$ (230 $yd^3$) of U.S.-owned residues (Middlesex sands) (Ausmus et al. 1980; Anderson et al. 1981). Radioactive contamination is present throughout the facility as a result of prior storage activities, leaching, and water transport of the residues. There is contaminated water in the canals in the bottom floor of Building 410. This water may have originated from precipitation and possibly from shallow saturated zones in the surrounding soils (Ausmus et al. 1980). It then became contaminated upon contact with the residues and contaminated surfaces in the building. The level of uranium in the residues is less than 100 ppm, and radium is less than 10 pCi/g (Anderson et al. 1981). Radon levels in the building range from 3 to 26 pCi/L (Ausmus et al. 1980).

The proposed clearing and excavation areas (Figures 3 and 4) are contaminated as a result of past storage activities as well as wind and water erosion of stored materials, particularly erosion of residues from the R-10 pile located north of Building 411. (Remedial action was taken in 1982 to stabilize and construct a dike around the R-10 pile.) Other contaminated areas on the site--excluding contaminated buildings, residues, and ditches--are shown in Figure 5. Radium-226 concentrations in these contaminated areas (Table 1) are above the criterion that is being used for interim actions at NFSS (i.e., 15 pCi/g above background). In the central ditch sediments, radium-226 concentrations are as high as 1,900 pCi/g in a small section onsite (Table 1); concentrations offsite are at least a factor of 10 lower. Cesium-137 is the primary contaminant in the northwest area (Area 3, Figure 5), with soil concentrations as high as 59,000 pCi/g in a small 1-$m^2$ (11-$ft^2$) area to a depth of 1.2 m (4 ft) (Ausmus et al. 1980; Anderson et al. 1981). This contamination results from previous storage of reactor materials in this area.

More detailed information on the extent of the radioactive contamination on and near the site as well as possible alternatives for disposition of the Afrimet residues and the entire NFSS can be found in: U.S. Atomic Energy Commission (1974); Cavendish et al. (1978); Ausmus et al. (1980); Acres American Incorporated (1981a, 1981b, 1981c); Anderson et al. (1981); Battelle Columbus Laboratories (1980); and Bechtel National, Inc. (1982a, 1982b, 1982c, 1982d, 1982e, 1982f).

## SETTING

The Niagara Falls Storage Site is located in Niagara County in Western New York (Figure 1), within the town (township) of Lewiston and adjacent to the town (township) of Porter. It is about 30 km (19 mi) north of Buffalo, New York; 10 km (6 mi) north of the city of Niagara Falls; 6.5 km (4 mi) south of Lake Ontario; and 5 km (3 mi) east of the Province of Ontario, Canada.

There are several buildings and private roads on the fenced-in site (Figure 3). The site is zoned industrial and is currently used only for storage of radioactive residues and soils. Most of the site is covered with second-growth forest, shrubs (brush), grasses, and marsh vegetation. Surface water flows into the west and central ditches and subsequently into Fourmile Creek and Lake Ontario (Figure 6). The channeled ditches are overgrown with cattails. Water flow, when it occurs, is generally slow (Ausmus et al. 1980), except during spring melt when the flow may be rapid; much of the time there is essentially no flow at all. The 100-year floodplain is contained within the drainage ditches (U.S. Dep. Housing Urban Dev. 1980).

Land uses immediately adjacent to the site are varied. A hazardous-waste-disposal facility operated by SCA Chemical Waste Services is located north and east of the site. A sanitary landfill is being constructed to the east by Modern Disposal, Inc. South of the site is federal government property controlled by the General Services Administration and used for training construction equipment operators. There is also a sanitary landfill south of the site, which is owned by the town of Lewiston. West of the facility is a Niagara Mohawk Power Corporation transmission line corridor (Acres American Inc. 1981a). All these properties are located on land that was once part of the original MED site (Figure 2). There are eight property owners (including the U.S. Government) located along offsite portions of the west and central drainage ditches north of the site (Acres American, Inc. 1981a).

Land uses within the towns (townships) of Lewiston and Porter are predominantly rural and include row-crop agriculture, orchards, recreation areas, old abandoned fields, and second-growth forests (Table 2). These areas are projected to remain rural through the year 2000. A recreational area, Fourmile Creek State Park, is located at the confluence of Fourmile Creek and Lake Ontario, about 3 km (2 mi) downstream from the central ditch (Figure 6).

The nearest permanent residence is 1.1 km (0.7 mi) southwest of the R-10 pile, and there is a trailer park 2.6 km (1.6 mi) northwest on Balmer Road (Figure 7). Workers at SCA Chemical Waste Services work outdoors 1.2 km (0.75 mi) north of the R-10 pile. During the summer, there are campers at the KOA campground 0.7 km (0.4 mi) southwest of the R-10 pile on Pletcher Road (Figure 7). Hunters occasionally use the area west of the Niagara Mohawk corridor.

The population of Niagara County, which has declined since 1970, was 227,101 in 1980 (Table 3). Population growth to the year 2000 is projected to be minimal (Table 3). Local town (township) and village population statistics are presented in Table 3. The nearest major population centers are the city of Niagara Falls (71,384) and the Buffalo metropolitan area (1.5 million). As of May 1982, the county had a civilian work force of 104,169, with an unemployment rate of 13.6%.

Major highway transportation routes in the area are State Route 93 to the north, U.S. Route 104 to the south, and the Robert Moses Parkway to the west (Figure 1). Local roads near the site and central drainage ditch include Lutts, Cain, Balmer, Pletcher, and Porter Center roads (Figure 7). No traffic counts on local roads are currently available.

Niagara County has a humid, continental climate that is moderated by the lake effects of Lakes Erie and Ontario. Average annual precipitation is 83 cm (33 in.), which is fairly evenly distributed throughout the year. Approximately 140 cm (56 in.) of snow falls, primarily between November and March (Acres American Inc. 1981a). The wind is predominantly from the southwest.

The NFSS is located on the southern shore of Lake Ontario, 3.2 km (2 mi) north of the Niagara Escarpment (Figure 1), on the relatively flat terrain of the Erie-Ontario Lowlands Physiographic Province. Elevations at the site range between 93 and 98 m (310 and 320 ft) MSL; the lower elevations correspond to the man-made drainage ditches. Creeks and drainage ditches on the site and surrounding areas are shown in Figure 6. About one-third of the site has soils that remain saturated throughout the year and are covered by marshy vegetation.

Geologically, the region is characterized by approximately 15 m (50 ft) of overburden that is underlain by a 274-m (900-ft) sequence of Ordovician-age shales and siltstones of the Queenston Formation. The overburden material is composed of glacial and recent alluvial deposits and includes dense tills, glaciolacustrian clays, and numerous lenses of glaciofluvial sands and gravels (Acres American Inc. 1981a, 1981b).

At NFSS, groundwater is present in both the glacial/alluvial deposits and bedrock and generally flows towards the northwest. There are essentially three aquifers underlying NFSS: (1) an unconfined, perched soil aquifer in a series of possibly discontinuous sandy silt or silty sand lenses 3 to 6 m (10 to 20 ft) below the ground surface, (2) a continuous, confined soil aquifer within the brown silty sand unit approximately 9 to 12 m (30 to 40 ft) below ground surface, which is contiguous with (3) a confined bedrock aquifer within the weathered upper meter of the Queenston Formation (Acres American Inc. 1981b). The groundwaters of all aquifers underlying NFSS have high concentrations of sulfate and calcium and are of low quality for drinking water (Acres American Inc. 1981a). Although private wells near the site have been monitored for radionuclide concentrations in groundwater, no ranges or seasonal variations have been published to date, and background concentrations for the site and region have not yet been established.

The radiological characteristics of the various residues, contaminated areas, and ditch sediments were described in the preceeding section. The residues and ditch sediments also contain metals and rare earths (Table 4). Concentrations at some sampling sites in the central drainage ditch are as high as those in the R-10 pile, probably due to past erosion of materials from the pile into the ditch. North of NFSS, the central ditch may also be contaminated with metals and organic compounds from SCA Chemical Waste Services operations (hazardous waste management). Until recently, SCA discharged to the central ditch (discharges are now routed through a pipe to the Niagara River). As specified in the old SCA State Pollution Discharge Elimination System (SPDES) permit (N.Y. Dep. Environ. Conserv. 1979), the discharges from SCA were limited to batch discharges at times when water was flowing in the ditch (a few weeks in spring and fall) such that the ditch flow diluted the discharge by a factor of 20 (Ludlam 1982). The discharges were monitored for pH, specific conductivity, and some organic chemicals. Heavy metals were removed prior to discharge. In addition to this discharge, there may be some contamination resulting from runoff into the central ditch from unsecured areas on SCA property during rainy periods (Ludlam 1982). No information is available on concentrations of metals or organic chemicals in ditch sediments downstream of SCA property. Samples of ditch sediments downstream of SCA are being analyzed for EPA priority pollutants.

Various state and local governing bodies may have jurisdiction over or concern about the proposed remedial action at NFSS (Table 5). Local residents and interest groups have also shown interest and concern about the site. Newspaper articles have appeared, and private citizens have written letters to DOE and the U.S. Environmental Protection Agency (EPA). A Citizen's Oversight Committee was formed by U.S. Representative John LaFalce in response to public questions raised concerning the potential health hazards at the site (LaFalce 1980). Representative LaFalce has indicated that the purpose of this committee is to advise him regarding NFSS and to work with DOE to ensure that DOE's proposals are sound and acceptable to the committee. In a recent report to New York Assembly Speaker, Stanley Fink, regarding federal involvement in several hazardous-waste sites in the Niagara Falls area (Zweig and Boyd 1981), NFSS was mentioned as posing a hazard to public health and safety. There has been debate on whether the alleged hazards actually exist. Since October 1982, there have also been numerous newspaper articles about potential DOE long-term actions at the site and about discharges of contaminated water. Awareness and concern about radioactive and other hazardous wastes have been heightened by publicity about the nearby Love Canal toxic waste problem, the nearby West Valley high-level-radioactive waste project, and the Three Mile Island nuclear power plant accident (Zweig and Boyd 1981; U.S. Dep. Energy 1982c).

## PROPOSED ACTION AND ALTERNATIVES

The Department of Energy proposes to take interim remedial actions to reconsolidate, stabilize, and control radioactive materials located on and near NFSS as part of its ongoing maintenance and caretaker operations. Details of the proposed FY 1983 actions are as follows.*

Several areas onsite (Figure 3) will be cleared of trees, brush, logs, and other dead wood. Also to be cleared are (a) the offsite west drainage ditch (Figure 6), (b) about 3.2 km (2 mi) of the central drainage ditch immediately north of the site (Figure 6), (c) a swath about 6-m (20-ft) wide along one side of the ditches (for a haul road), and (d) a swath about 3-m (15-ft) wide along the perimeter fence. The larger stumps and roots will be grubbed out. A total of about 27 ha (66 acres) will be cleared, 15 ha (36 acres) onsite and 12 ha (30 acres) offsite. The cleared and grubbed material will be temporarily stored at two onsite storage areas (Figure 3).

Contaminated sediments and soil materials will then be excavated and placed in the R-10 pile diked area. For this proposed action, contaminated materials will be defined as those materials having a concentration of

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radium-226 greater than 15 pCi/g above natural soil background or a concentration of cesium-137 greater than 80 pCi/g. Based on previous radiological surveys and engineering estimates (Ausmus et al. 1980; Anderson et al. 1981; Acres American Inc. 1981a), it is estimated that about 23,000 $m^3$ (30,000 $yd^3$) of contaminated sediments will have to be removed from the offsite ditches (Figure 6) and about 11,000 $m^3$ (14,000 $yd^3$) will have to be removed from the various locations onsite (including onsite ditches, Figure 4).* It is expected that the depth of excavation will vary from 0.2 to 1.2 m (0.5 to 4 ft) in the ditches and from 0.2 to 0.6 m (0.5 to 2 ft) elsewhere.* The amount that may actually have to be removed from the ditches may be half or twice as much, depending on the actual lateral and vertical extent of contamination (Acres American Inc. 1981a). Additional radiological survey work is being performed to more precisely define the extent of needed excavation.

Temporary haul roads will be constructed alongside the ditches. As soon as these roads can support construction traffic in early summer, excavation of ditch materials can begin, starting at the upstream end. The subcontractor will be allowed a choice of methods, as long as the spread of contaminated soils/sediments and water is controlled. An example of one excavation method that may be used is a check dam/dewatering system (Figure 8). A check dam made out of clean (uncontaminated) fill material would be constructed across the ditch upstream of the section to be excavated. Two downstream check dams would be constructed by pushing up contaminated ditch materials. Any water in the upstream section would be pumped to the downstream section in order to dewater the area to be excavated. This water would either be released downstream, if radioactive contamination limits were not exceeded, or pumped via temporary pipes to the onsite sedimentation pond/water treatment system (see later discussion). After a section was excavated, the upstream check dam of clean fill would be used as partial backfill to restore the ditch grade. Additional clean fill would be brought in for completion of the desired grade and for construction of a new, clean check dam at the downstream end of the excavated section. A new water-holding/sedimentation section would be created farther downstream. About three days would be required to complete excavation and backfill for each section. In the farthest downstream sections of the central drainage ditch, where water flow is greater, this same basic system could still be used, but with the addition of a lengthwise dike down the center of the ditch to channel water to one side while dewatering and excavating the other side.

Backfill material for the ditches will probably be the same kind of local clay that is being used in the construction of the R-10 dike during 1982. This clay, which is similar to the clay soils that underly the ditches, would be compacted to 90% of theoretical maximum density. Some of the spoil piles that are alongside the ditches from the original ditch construction may be

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*The estimates for depths and volumes of excavation were originally based on a proposed definition of contaminated materials as those materials having a concentration of radium-226 greater than 5 pCi/g above soil background. The action criterion for this proposed action has since been revised to 15 pCi/g for radium-226. Volumes and depths of excavation will therefore probably be less, but revised estimates are not yet available. The analysis in the next section of the Action Description Memorandum is based on the original estimates and thus represents a conservatively high estimate of potential impacts.

used as backfill. Backfill needed for both onsite and offsite work will probably be equivalent to the amount of excavation, or a total of 34,000 $m^3$ (44,000 $yd^3$) (ranging from 17,000-68,000 $m^3$). There are several local sources of backfill materials, including excess materials that were excavated for the hydroelectric and pump storage projects in the Niagara Falls area.

Immediately after a section of ditch or onsite area has been excavated and backfilled, the area will be scarified, seeded, and mulched (probably using a hydroseeder), and covered with jute netting, as necessary, to stabilize the surface and prevent erosion. Straw bales, diversion swales, and any other temporary runoff and erosion control devices will be removed.

All excavated contaminated materials will be placed within the R-10 diked area (Figure 4). After the materials are sufficiently dry, they will be "conditioned" by discing and compacting. A synthetic reinforced rubber membrane (EPDM) will be placed over the materials. If the materials are too wet at the end of the construction season, they will be temporarily covered with EPDM until next year when they can be properly conditioned.

Several of the ditch culverts under roads are currently undersized relative to potential storm runoff. Therefore, the old culverts will be removed in order to excavate contaminated materials and will be replaced with larger culverts. At the Balmer Road crossing, the road will be kept open to traffic by either constructing a temporary bypass on one side, using sheet piling and excavating one-half at a time, or constructing a temporary bridge to one side. At the Lutts Road crossing, the road may have to be temporarily closed to traffic because the entire crossing area may be contaminated from previous reworking of the culverts and roadbed with potentially contaminated ditch sediments.

About 30 m (100 ft) of two abandoned water pipelines (19-inch line to the former firewater reservoir/pond west of the site and 42-inch water main to the town of Lewiston) will be removed between the southwest building area and Lutts Road to preclude any future migration of contaminated materials via these pathways.

Truck traffic (for transport of contaminated and backfill materials) will be routed to avoid congestion and to minimize the spread of contamination. The temporary haul road alongside the ditches will be used to transport contaminated materials to the R-10 pile diked area, whereas public and private roads will be used for movement of backfill material. Some temporary access roads may have to be built to the central ditch, depending on arrangements with property owners. Peak construction traffic on public roads (Figure 7) is not expected to exceed 18 trucks per hour during the main excavation/backfill period, which will last about three months. Peak construction traffic crossing Balmer Road near the central ditch and Lutts Road is expected to be 24 trucks per hour. Routing of construction traffic will depend on subcontract awards (e.g., location of backfill materials), but Pletcher, Balmer, and Lutts roads are expected to bear most of the construction traffic.

Vehicles leaving the contamination control areas will be washed down, as necessary, at the onsite decontamination pad (constructed in 1982, Figure 3). About six vehicles per hour can be accommodated. Water for washing the vehicles and for wetting down roads and work areas will be taken from the onsite water treatment ponds and, if necessary, from existing onsite town hydrants.

The 175 $m^3$ (230 $yd^3$) of Middlesex sands currently located in Building 410 (Ausmus et al. 1980) will be moved to the north end of the R-10 pile diked area or placed in the basement of Building 410 (Figure 3) and covered with contaminated soils excavated from other areas. The method of movement has not yet been determined, but hydraulic mining (slurry) may be used.

The residues in Building 411 will then be dewatered to provide a firm working surface and to reduce possible migration of nuclides from the residues into the groundwater. The water resulting from the dewatering process will be routed through the sedimentation pond/treatment system (see below) before release. A multilayer cover system (possibly consisting of EPDM-reinforced synthetic rubber membrane and a layer of clay) will be placed over the residues to reduce the amount of radioactive radon-222 gas escaping from the residues.

The canals in Building 410 will also be dewatered, and the abovegrade portions of the building will be demolished. The belowgrade structure will be used for storage of contaminated rubble and possibly the Middlesex sands. The portion of Building 410 that will have to be disposed as contaminated rubble will have to be determined in the field. Uncontaminated rubble will either be stored onsite or may be converted to riprap for stabilizing the sides of the R-10 dike.

The onsite sedimentation pond/water treatment system (constructed in 1982, Figure 3) will be used to treat water resulting from: (1) leachate or runoff from the excavated materials placed on top of the R-10 pile (contained within the dike), (2) washing of equipment at the vehicle decontamination facility, (3) ditch dewatering, if necessary, and (4) dewatering of residues in Building 411 and canals in Building 410. The two sedimentation ponds can be operated independently and have holding capacities of 1,000 $m^3$ (250,000 gal) and 1,500 $m^3$ (400,000 gal), or a total of 2,500 $m^3$ (650,000 gal). They are designed to hold the runoff from a 10-year rainfall event, and backup capacity is provided within the R-10 dike area (until the area is filled up with contaminated soils at the end of interim actions in future years). If sedimentation alone is not sufficient treatment to meet DOE operating limits for discharge to the central drainage ditch (30 pCi/L for radium-226), a portable water treatment unit--which includes a charcoal filter, a radium-specific DOW Chemical Company medium (proprietary), and a cation resin--will be used to reduce concentrations of radium-226 to allowable limits. This unit can treat an average of 0.076 $m^3$/min (20 gal/min) in batches from the two small holding (clean water) ponds (maximum design rate is 0.2 $m^3$/min [54 gal/min]). All discharges will be monitored to ensure compliance with the SPDES permit. During excavation of the central drainage ditch, water can either be discharged to the ditch below the excavation area via temporary pipes, or discharged above the excavation area and pumped around the excavation, if necessary.

It is anticipated that the proposed activities will be completed during the 1983 summer construction season (May through October). There will be about the same number of workers as during the 1982 season, i.e., a total of 70, including 25 management and monitoring personnel brought in from outside the area. It is expected that construction workers will be affiliated with local Niagara County unions, as was the case for the 1982 work.

A summary of mitigative measures and monitoring that will be part of this proposed action is given in Table 6.

There are two basic alternatives to this proposed action: (1) defer action until the permanent disposition of NFSS can be determined, and (2) remove the excavated contaminated materials to some other site for permanent disposal. Because the permanent disposition of NFSS is unlikely to be determined for about two years, DOE considers it prudent to continue the interim program of returning contaminated materials to the site and bringing the site under control to meet DOE operating regulations. The second alternative cannot be implemented because no offsite permanent disposal sites are available for disposal of these wastes.

## POTENTIAL ISSUES AND ANALYSIS

Using the information given in the previous sections, as well as the methods of analysis discussed in a report by Argonne National Laboratory (1982), the following potential issues were identified and assessed.*

### Radiological

A major potential issue is the radiological impacts associated with the proposed action. The predominant pathway by which the radionuclides could reach nearby workers and members of the general public during the proposed action is inhalation of contaminated dust particles and radioactive decay products such as those from decay of radon gas (one of the radionuclides in the decay chain of the uranium-238 found at NFSS). Other pathways (such as external dose from submersion in a cloud of dust, external dose from radioactive particles deposited on the ground, or internal dose from ingesting contaminated food or water) are expected to be relatively insignificant (Argonne Natl. Lab. 1982). The bases for the analysis of potential doses to nearby members of the general public during the six months of the proposed action are as follows:

- Based on gamma-level readings, an average concentration of 100 pCi/g for each of the uranium-238 decay series nulides present in the contaminated materials that will be moved during the proposed action was considered to be appropriate for analysis of radiological impacts. This is a realistic approximation for radium-226 concentrations, but it is conservatively high for all other nuclides (which leads to a probable overestimation of impacts).

- It is expected that the major portion of radioactive dust releases will be at the R-10 pile where contaminated materials will be unloaded, dried, disced, mixed, and compacted. Dust emissions from similar general construction activities have been estimated to be about 2700 kg/ha/mo, and it has been found that dust controls, such as will be instituted during the proposed action (Table 6), reduce emissions by about 50% (U.S. Environ. Prot. Agency 1977). Therefore, the analysis was based on an emission rate of about 1350 kg/ha/mo for an area equivalent to one-half of the R-10 pile (1.1 ha [4.8 acres]) over the six months of the proposed action.

*When preliminary engineering is completed on the anticipated additional FY 1983 actions, a supplemental ADM will be prepared that will address the additional actions and related environmental issues.

- Each nearby member of the public was conservatively assumed to be present during the hours the action will take place.

- Buffalo meteorological data were used since onsite data have not yet been analyzed.

- The contribution from the cesium-137 present in the northwest corner of the site (see Proposed Action) was not calculated because the small amount of cesium would contribute a very small fraction to the total dose.

- The methods of analysis are detailed in the Argonne National Laboratory (1982) report.

Assuming that the mitigating measures discussed in Table 6 are employed, potential doses to members of the public near the proposed action are expected to be extremely low (Table 7). The predicted whole-body doses are similar to doses received while spending a few minutes on a jet plane at high altitudes or spending the same amount of time as the remedial action (six months) at an altitude that is a few feet higher (Table 8). Specific organ doses (e.g., bone and lung) are much less than doses received from natural sources (Table 8).

Doses to workers will be controlled and limited to less than those specified by federal regulations for occupational doses (e.g., whole-body doses of 3000 mrem/quarter or 5000 mrem/year). Based on experience during the 1982 remedial action at NFSS, worker doses are expected to be well below limits. Workers are also being trained regarding radiation risks and proper health physics procedures (Table 6).

Another radiological issue may be whether the decontamination criterion for the offsite portion of the drainage ditches (15 pCi/g above background for radium-226) will be considered sufficient to allow unrestricted use of the offsite areas. The DOE believes that this decontamination criterion is conservatively low compared to any applicable criterion or standard for release of an area for unrestricted use that may be promulgated in the future.

The adequacy of the sedimentation pond/water treatment system with respect to discharge of radioactively contaminated water may also be an issue. Sedimentation alone may be sufficient to allow discharge of runoff water. However, the waters in the buildings, particularly Building 411, have been in contact with the stored residues and may have higher concentrations of dissolved substances as well as higher concentrations of fine particles that do not readily settle out. Therefore, these waters will be monitored prior to discharge to the sedimentation ponds and, if necessary, will be treated in batches separate from the storm runoff water. The treatment system, consisting of a radium-specific DOW medium, charcoal filter, and cation resin will be tested in 1982 so that its effectiveness in removing contaminants will be known before the dewatering of Building 411 begins in FY 1983. No water will be released unless concentrations of radioactive substances are at or below DOE operating limits (see later discussion of nonradiological substances in the discharge).

The sufficiency of the water discharge criteria for radioactive contaminants may be an issue. Although the discharge will be at or below DOE operating limits (e.g., 30 pCi/L for radium-226), a discharge at or only slightly lower than the established limits may not be considered to be "as low as reasonably achievable" (ALARA). However, as mentioned previously, the Department tested a new proprietary DOW medium during 1982. This system was purchased and will be employed during the proposed FY 1983 action. In practice, the contaminants in the discharge may actually be present at levels well below the DOE operating limits, in keeping with ALARA.

Physical and Biological

The temporary increase in erosion and sedimentation during the proposed action may be another issue. However, mitigating measures--such as the use of straw bales and diversion swales, scarification and jute netting, prompt seeding and mulching, and diversion of runoff through a sedimentation pond--should help minimize the potential for erosion and sedimentation.

The adequacy of the sedimentation/holding ponds to retain runoff water may be an issue. The system has been designed to accommodate a 10-year storm event, but a sequence of rainfalls of lesser magnitude over a short period of time could stress the system. However, the R-10 diked area would provide additional backup retention if necessary.

The adequacy of the sedimentation/treatment system with respect to discharge of nonradiological chemical pollutants may also be an issue. There will be two primary sources of chemically contaminated water: (1) the Building 411 water and (2) the leachate and runoff from the central drainage ditch sediments. The Building 411 water may be of concern with respect to elements such as arsenic, chromium, cobalt, copper, lead, nickel, and selenium (Table 4). These elements will be both dissolved in the water and associated with fine clay particles that will not readily settle out. Therefore, this water will be tested for these elements prior to discharge to the central drainage ditch. An SPDES permit is needed with respect to the nonradiological nature of the discharge. If contaminant concentrations exceed applicable state discharge limits, the water will be treated, as necessary, to reduce contaminant concentrations to acceptable levels. Available treatments include filters and ion-exchange columns. It is expected that the SPDES permit will be granted prior to the planned FY 1983 actions.

The central ditch sediments may be of concern both with respect to metals such as cobalt, copper, and nickel (Table 4) and, in the vicinity of SCA Chemical Waste Services, with respect to both hazardous organic compounds and metals. The proposed action could result in release of these chemicals further downstream at a temporarily accelerated rate and could also lead to release in the discharge from the sedimentation/treatment system to the central ditch. These chemicals could be dissolved in leachate waters and/or suspended on fine particles. Because the significance of this potential issue will depend in part on the amounts of chemicals in the sediments, the sediments in the vicinity of SCA will be sampled and tested for metals and organic compounds based on the kinds of wastes SCA has handled in the past. Although Ludlam (1982) maintains that discharge and cleanup procedures at SCA were sufficiently rigorous that essentially no organics or metals were discharged, leached or washed into the central ditch, it is considered prudent to analyze the ditch sediments. After such analysis, the consequences of excavating and storing the ditch material will be reevaluated. It is possible that the currently proposed action and mitigative measures (e.g., excavating the ditch in sections, controlling seepage and runoff, using seamless or lined trucks, covering the ditch sediments in the R-10 pile diked area as soon as possible after drying and compacting) will be sufficient to preclude significant adverse impacts. If necessary, the excavation and storage method and/or water treatment and monitoring system will be modified to preclude the discharge of unacceptable concentrations of metals or organic compounds.

Two other potential issues with respect to organic contaminants in the ditch sediments have been raised: (1) the presence of organic substances may increase the rate of migration of radionuclides from the R-10 area to surface waters and groundwaters, and (2) the organic substances may degrade the rubber membrane (EPDM) cover (Ausmus 1981). Based on currently available information and considering that the organic ditch material will be mixed with clay ditch material (diluted) and dried (less organics in free liquid form), there will probably not be enough organic contaminants to be of concern. If significant amounts of organic contaminants are found in the ditch sediments, these issues will be reevaluated before the proposed action is taken, and the action will be modified as appropriate.

The decay of organic matter in the ditch sediments, leading to a buildup of gases under the EPDM cover, may also be a potential issue. However, a sample of ditch material was excavated in early 1982 and it was found that although the top 0.15 m (0.5 ft) is "black, smelly, slimy" organic material, the next 0.6-1.2 m (2-4 ft--depth of expected excavation) is a very tight clay (Levesque 1982). After drying out, discing, and compacting the ditch sediment material on the R-10 pile, plus covering the pile with EPDM/clay/soil, the decay of the organic matter should be sufficiently slow so that gases will not build up appreciably under the permanent cover system. Care will be taken to dry and thoroughly mix the ditch materials. The surface of the pile will be monitored for bulges, cracks, or other signs of any buildup of decomposition gases (Table 6).

In addition to the previously mentioned water quality issues, a potential issue associated with the dewatering of Building 411 is the continued migration of contaminants from the building. The proposed remedial actions should substantially decrease the movement of water into and out of the building. However, there may be some remaining connections to the groundwater through the building foundation. One or more of the pipes inserted into the residues for dewatering will be used to monitor any water level changes in the future. The potential issue of any remaining migration will be addressed when decisions are made regarding additional remedial actions.

The proposed dewatering and construction of a multilayer cover system over the Building 411 residues also raises the issue that this action may be a premature commitment of resources if it is found that the residues must be removed by a slurry method for permanent disposal elsewhere on NFSS or for preparation of the residues for disposal in a different form. However, because the ultimate disposition of the site--and specifically the Building 411 residues--is unlikely to be resolved in the near future, DOE considers the partial dewatering and construction of a cover system to be prudent caretaker actions.

The potential for continued migration of contaminants to groundwater from the materials stored within the R-10 pile dike may also be an issue. However, the combination of the subsurface clay trench, the dike, and the multi-layer cover system, will substantially reduce the rate of contaminant migration from the R-10 area. The potential issue of any remaining migration will be addressed when a decision is made on the permanent disposition of NFSS

Socioeconomic

The major potential socioeconomic issue associated with the proposed action is public apprehension that this interim action may lead to establishing NFSS as a permanent radioactive waste disposal site. However, none of the proposed actions are physically irreversible. Lacking any decision regarding permanent disposition of the site and given that removal of wastes from the site is only one of several alternatives, DOE believes that it is prudent to take the proposed interim action as part of its ongoing caretaker and maintenance responsibilities at the site. The mitigating measures presented in Table 6 -- such as informing the public about the proposed interim action and assuring them that they will be involved in any decision-making concerning the long-term, permanent disposition of the site -- should reduce apprehensions.

Another potential socioeconomic issue is the increased traffic, particularly at the Balmer Road crossing, and the potential for increased risk of vehicle accidents. Although no traffic count data are available, it is known that SCA traffic uses Balmer Road and that the road is a primary east-west route through the area (second to NY-93 and U.S. 104). There are no other major industrial, commercial, recreational, or residential areas along the roads likely to bear most of the construction traffic associated with the proposed action. Having a flagman at the Balmer Road crossing (Table 6) should help mitigate the increased accident potential. Furthermore, residential areas will be avoided when transporting backfill materials to the site and ditches.

The need to obtain right-of-way for equipment across private property may be an issue. However, the Federal Government still holds easement rights for maintenance of the central ditch (Acres American, Inc., 1981a). Informing landowners of intended actions and courteous respect for their property rights and interests can help to mitigate adverse public reaction to the proposed remedial actions.

Determination of the need to obtain several permits may be an issue. The Department has already applied to the New York State Department of

Environmental Conservation (DEC) for an SPDES permit for the non-radiological aspects of the discharge from the sedimentation/treatment system. The U. S. Army Corps of Engineers and the DEC will also be contacted to determine if Section 404 and 402 permits concerning dredge and fill operations in the central drainage ditch and pollutant discharges are needed. The DEC will be contacted to determine if a permit is needed for hauling contaminated sediments back to the site under Article 27, Title 3, of the New York Conservation Law (Part 364, collection and transportation of industrial-commercial and certain other wastes). The need for a permit to burn contaminated materials, and possibly emit radioactive substances to the air, will also be ascertained.

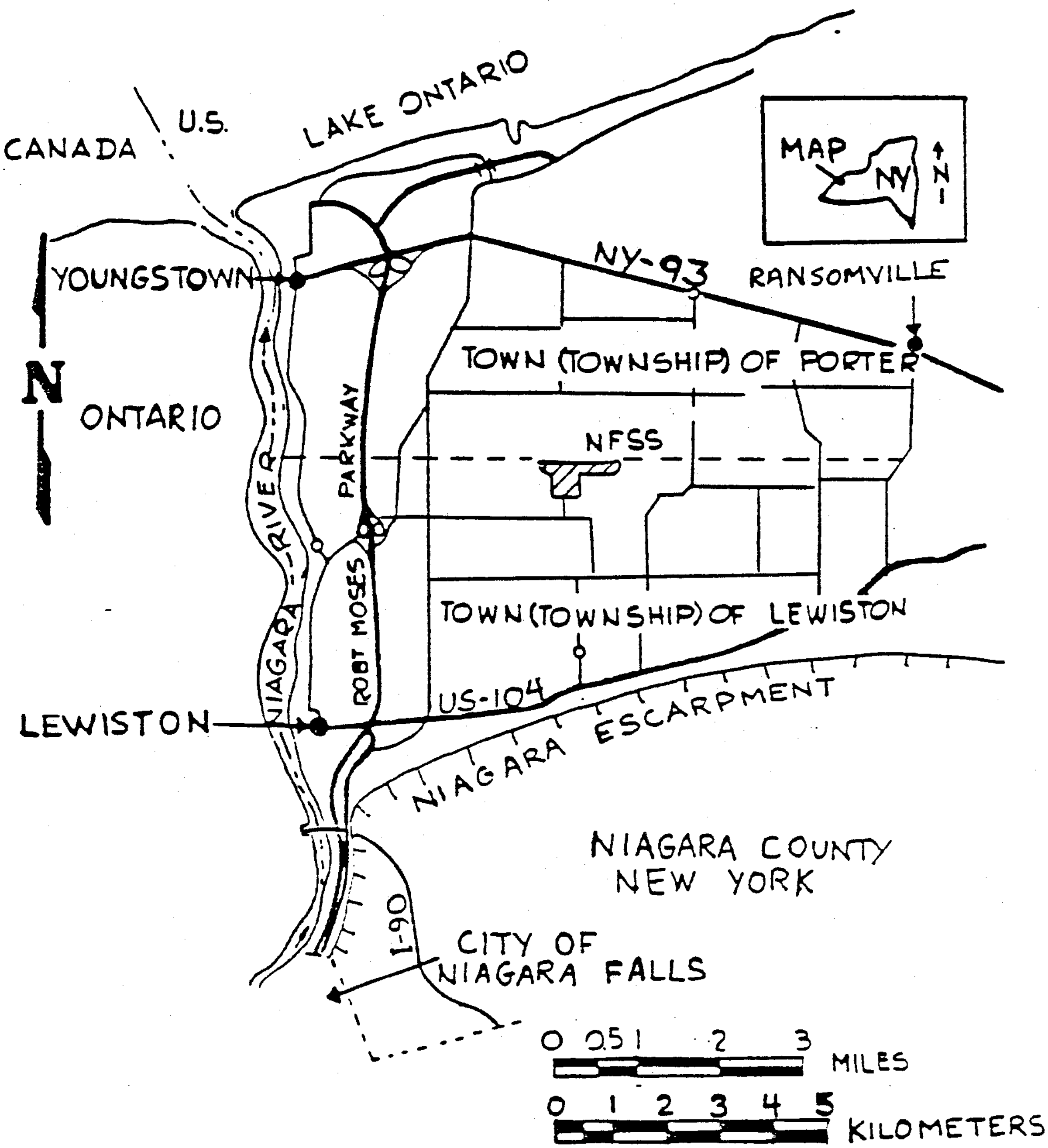


Figure 1. Niagara Falls Storage Site Location Map.

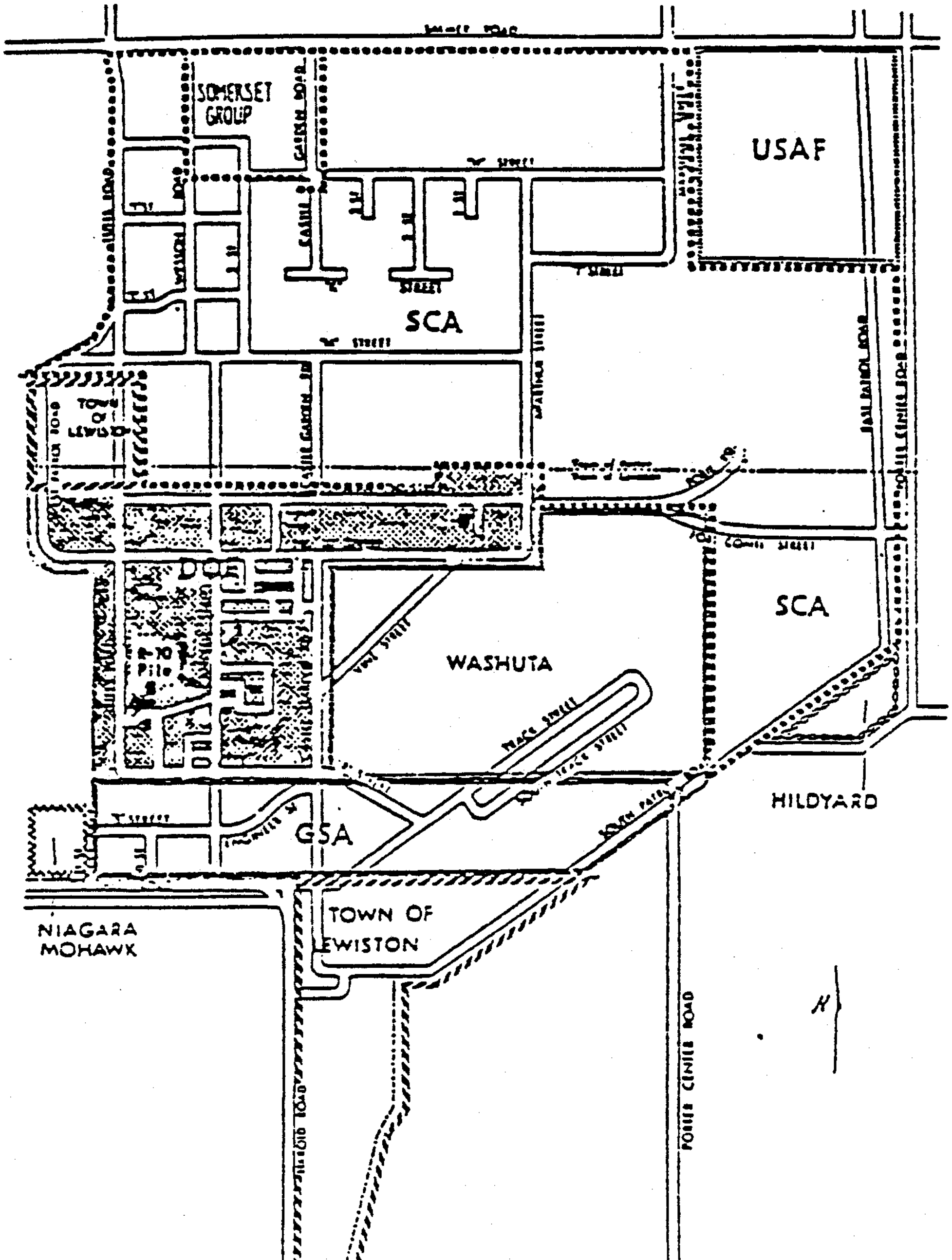


Figure 2. Current Ownership of the Original Manhattan Engineer District Site at the Lake Ontario Ordnance Works.

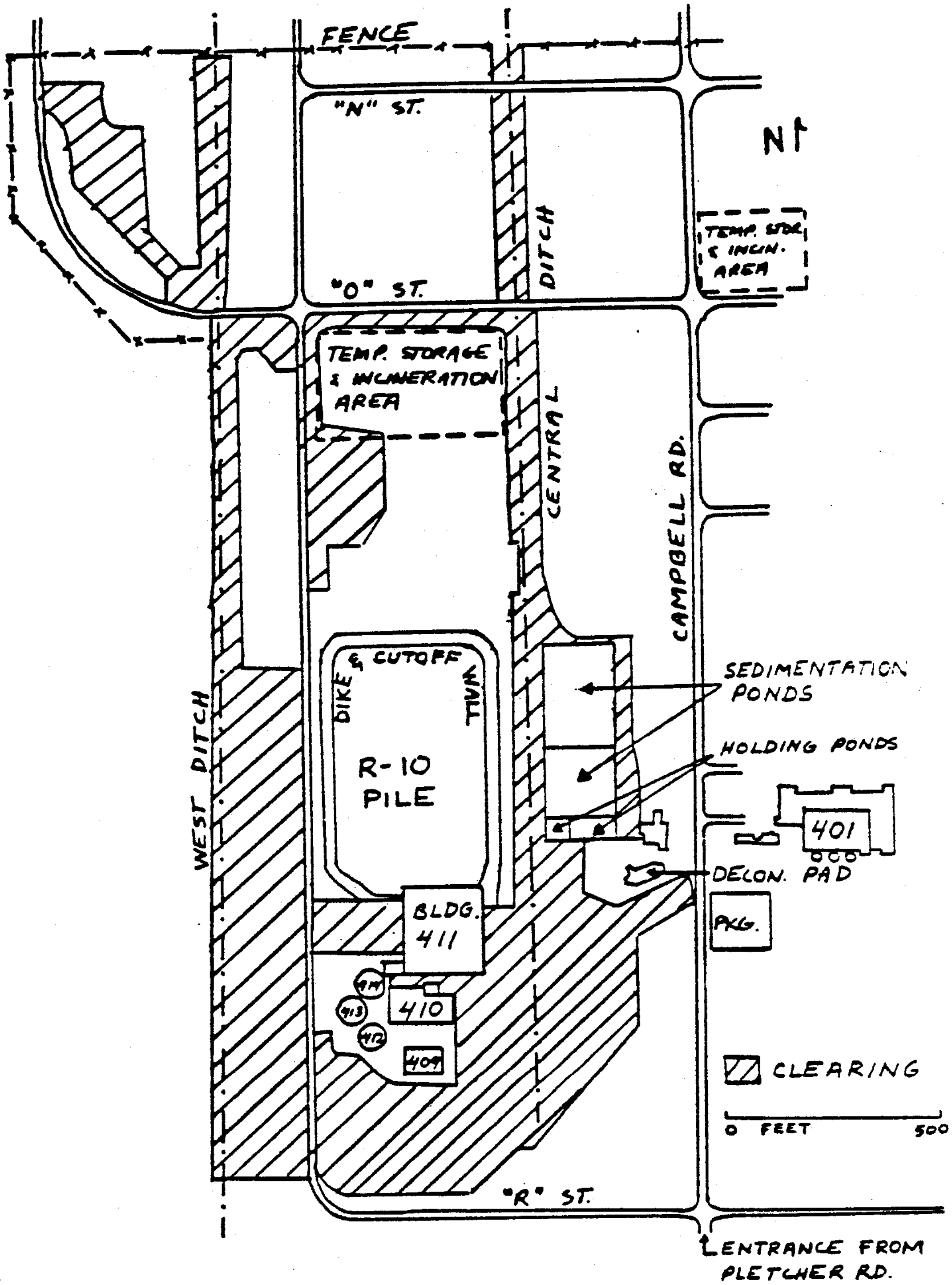


Figure 3. Proposed Onsite Areas to be Cleared. Adapted from Bechtel National, Inc. (1982b and 1982d--Drawings 15-DD07-D-02 and -03). Note: Some of these areas were cleared as part of R-10 add-on work or field change orders during 1982.

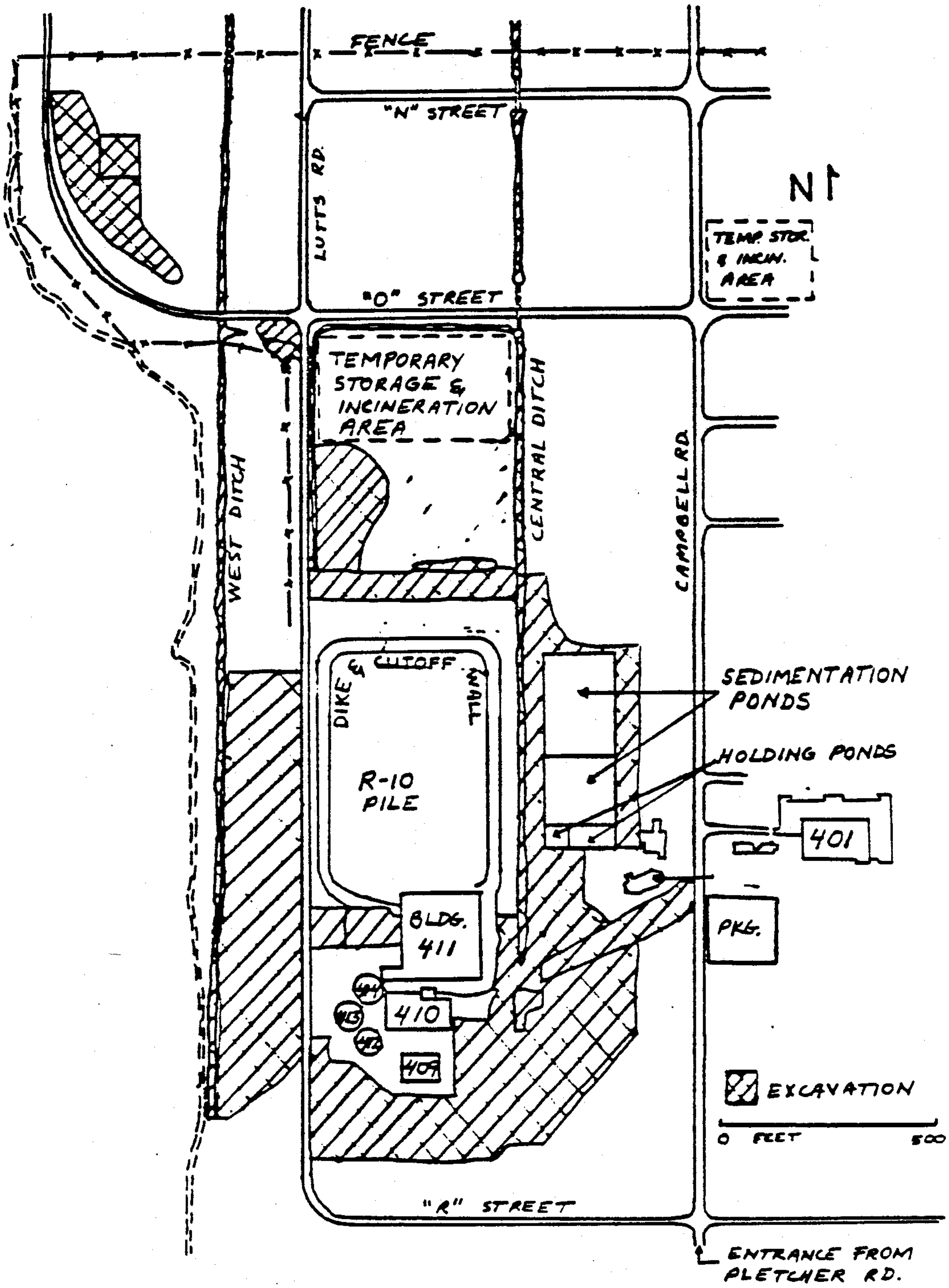


Figure 4. Proposed Onsite Areas to be Excavated. Adapted from Bechtel National, Inc. (1982b and 1982d--Drawings 15-DD07-C-04 and -05). Note: Some of these areas were excavated as part of R-10 add-on work or field change orders during 1982.

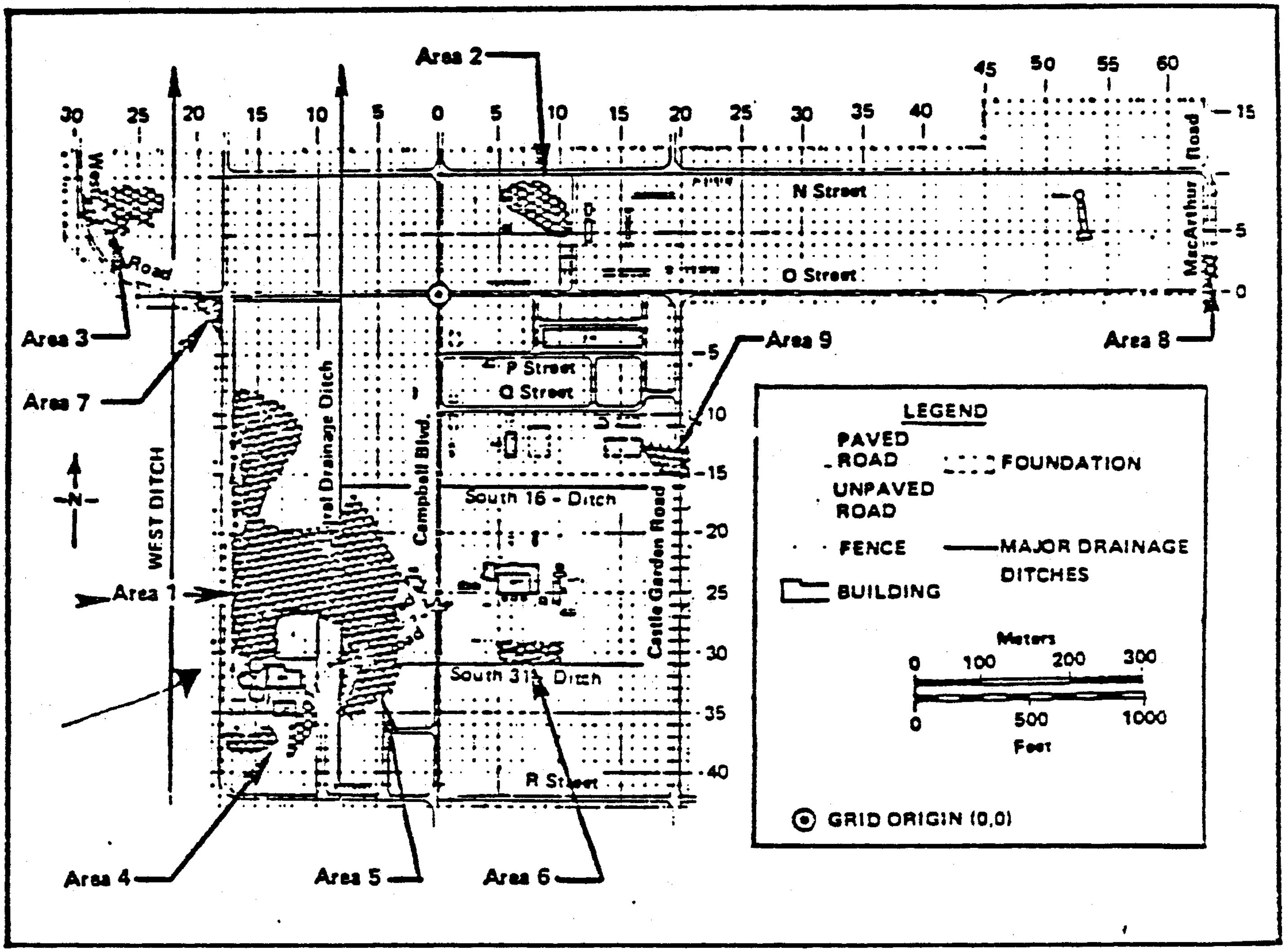


Figure 5. Some of the Contaminated Areas at the Niagara Falls Storage Site. (Contaminated buildings, residues, and ditches not included on the drawing.) Source: Ausmus et al. (1980).

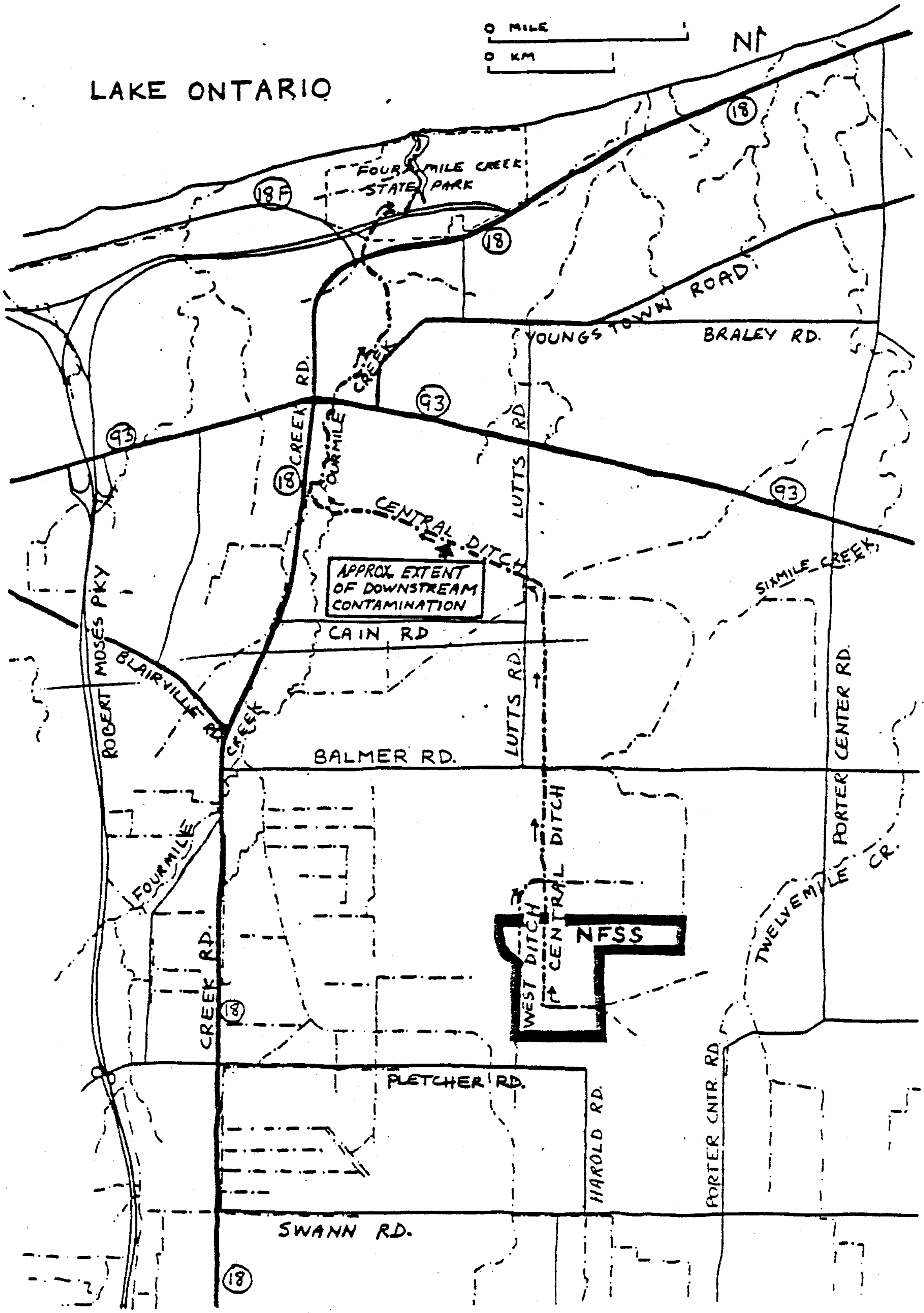


Figure 6. Drainage Ditches, Creeks, and Major Roads Near the Niagara Falls Storage Site. Adapted from U.S. Geological Survey (1965).

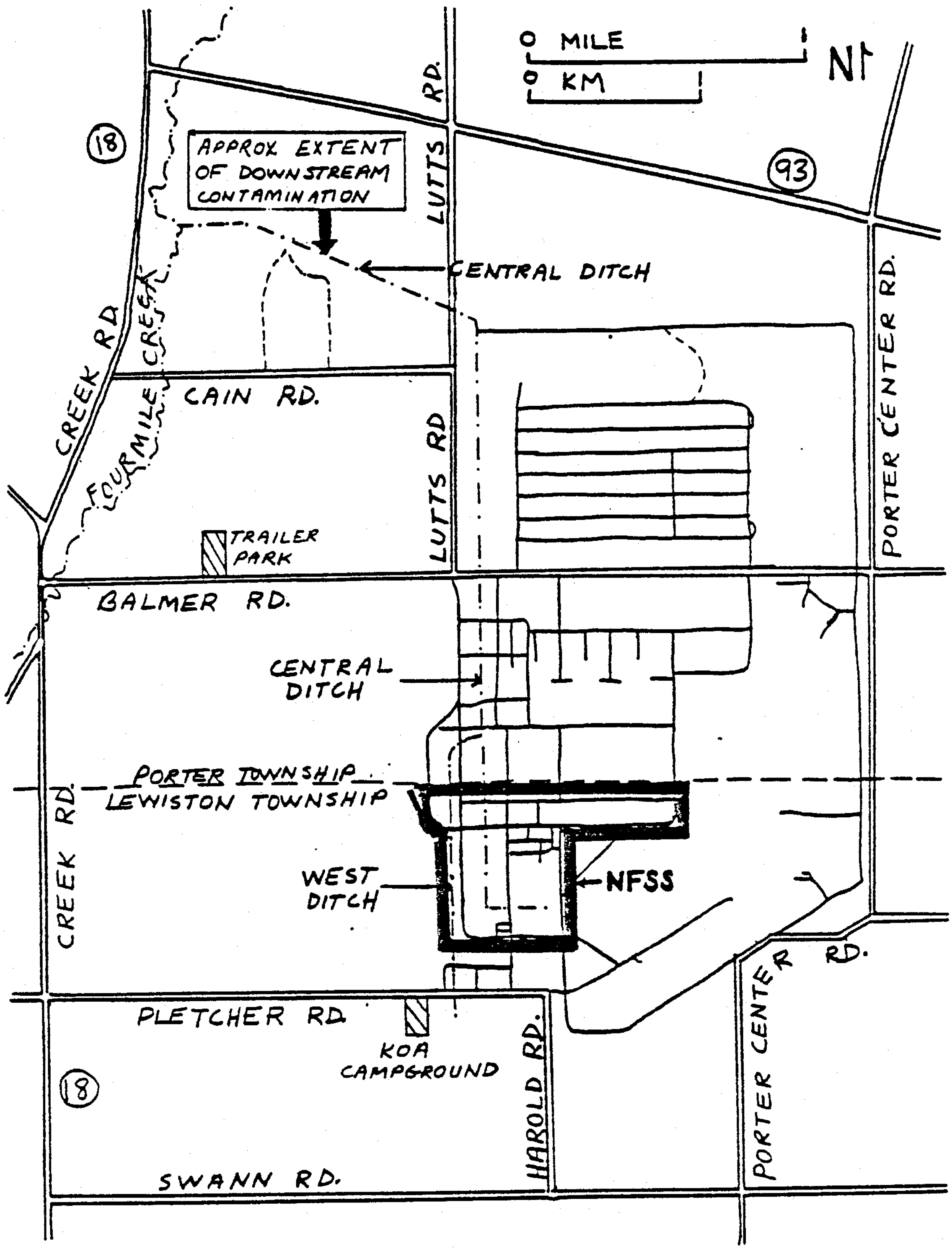


Figure 7. Primary, Secondary and Tertiary Roads (Public and Private) Near the Niagara Falls Storage Site (NFSS) and Central Drainage Ditch. Adapted from U.S. Geological Survey (1965) and 1980 aerial photographs.

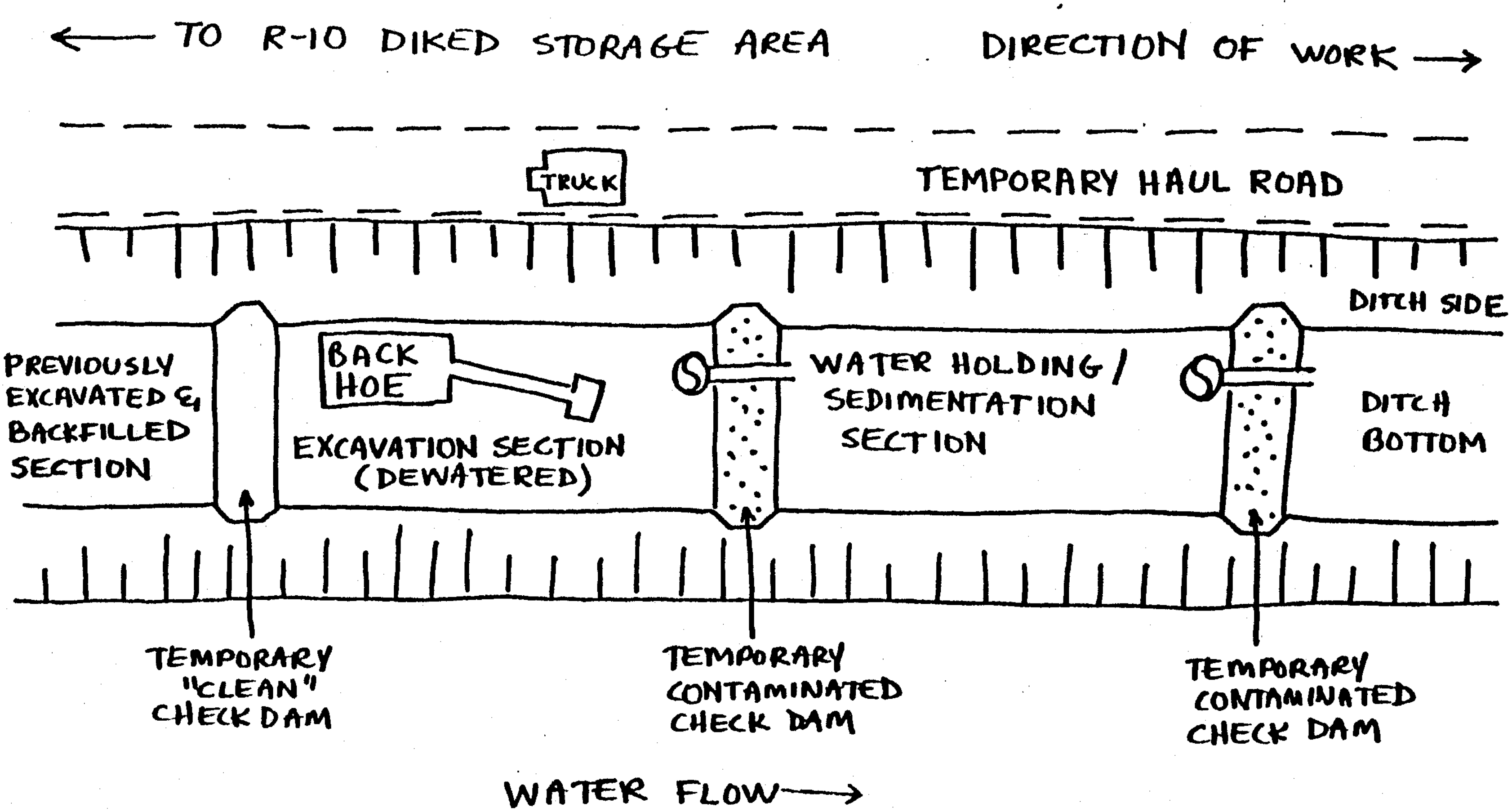


Figure 8. Example of One Method That May Be Used for Ditch Excavation at the Niagara Falls Storage Site (Check Dam/Dewatering System).

Table 1. Radiological Characteristics of Areas to be Excavated

| | Surface (1-cm) Beta-Gamma Level†[1] (mR/h) | Radium Concentration†[2] (pCi/g) |
|---|---|---|
| Area 1†[3] | 0.06 - 4†[4] | 4 - 9400†[4] |
| Area 3†[3] | 0.05 - 70 | 0.52 - 6.9†[5] |
| Area 4†[3] | 0.15 - 0.65 | 0.66 - 30 |
| Area 5†[3] | 0.1 - 0.5 | 1.5 - 131 |
| Area 6†[3] | 0.2 - 2 | 0.18 - 87 |
| Area 7†[3] | 1 - 2 | 0.9 - 5 |
| West ditch†[6] | 0.5 - 3 | 2.6 - 75 |
| Central ditch†[6] | 0.06 - 2.2 | 2.2 - 1900 |
| Area between Lutts Road and West ditch†[3] | 0.03 - 0.07 | 0.8 - 120 |

†[1] Background level is 0.06 mR/h.

†[2] Background concentration is 1.89 pCi/g. The remedial action criterion to be used for this proposed action is 15 pCi/g above background.

†[3] See Figures 4 and 5.

†[4] Remedial actions were taken in 1982 in portions of Area 1 that have the higher radium-226 concentrations. Proposed actions for 1983 would be in portions of Area 1 with lower concentrations.

†[5] Primary contamination in Area 3 is cesium-137, up to 59,000 pCi/g of soil. The remedial action criterion to be used for this proposed action is 80 pCi/g for cesium-137.

†[6] See Figures 4 and 6.

Source: Ausmus et al. (1980).

Table 2. Existing (1975) and Projected (2000) Land Uses for the Towns (Townships) of Lewiston and Porter and for Niagara County

| | | Percent of Land Area | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Location | Status of Land Use | Residential | Commercial/ Public/ Semipublic | Industrial | Forest/Brush/ Outdoor Recreation/ Vacant | Agriculture | Water/ Wetland | Transportation |
| Town of Lewiston (25,088 acres) | Existing | 7.7 | 6.2 | 1.0 | 32.2 | 43.5 | 7.7 | 1.4 |
| | Projected | 8.0 | 6.5 | 1.0 | 32.2 | 43.2 | 7.7 | 1.4 |
| Town of Porter (20,992 acres) | Existing | 4.1 | 4.6 | 1.5 | 25.8 | 61.9 | 0.3 | 1.6 |
| | Projected | 4.2 | 4.8 | 1.5 | 25.9 | 61.6 | 0.4 | 1.6 |
| Niagara County (341,670 acres) | Existing | 6.4 | 2.1 | 1.7 | 19.9 | 65.3 | 3.5 | 0.9 |
| | Projected | 6.6 | 2.2 | 1.8 | 19.9 | 65.0 | 3.6 | 0.9 |

Data from Interstate Commerce Commission (1981).

Table 3. Population Trends for the Towns (Townships) of Lewiston and Porter and for Niagara County

| Location | 1970†[1] | 1980†[1] | 1970-1980 (% change) | Projected 2000†[2] | 1980-2000 (% projected change) |
|---|---|---|---|---|---|
| Town of Lewiston | 15,888 | 16,219 | 2.1 | 16,500 | 1.7 |
| Village of Lewiston | 3,292 | 3,326 | 1.0 | | |
| Town of Porter | 7,429 | 7,251 | -2.4 | 7,800 | 7.6 |
| Village of Youngston | 2,169 | 2,196 | 1.2 | | |
| Village of Ransomville | 1,034 | 1,101 | 6.5 | | |
| Niagara County | 235,720 | 227,101 | -3.7 | 235,500 | 3.7 |

†[1] Data from U.S. Census Bureau, New York Regional Office.

†[2] Year 2000 projections were based on 1980 projections that were 1 to 7% higher than actually occurred. Therefore, year 2000 projections may be too high.

Data from Interstate Commerce Commission (1981).

Table 4. Concentrations of Selected Elements in Residues, Ditch Sediments, and Groundwater at the Niagara Falls Storage Site

| | Concentrations (ppm) | | | | | |
|---|---|---|---|---|---|---|
| | Residues | | Ditch Sediments | | Groundwater†[1] | |
| Element | Bldg. 411†[2] | R-10 Pile | Central†[3] | West | Site Periphery | R-10 Pile Area |
| Arsenic | 32 | 0.5-5 | 0.1-10 | 0.1-3 | 0.006-0.019 | 0.002-0.019 |
| Cerium | 1300 | 5-100 | 2-500 | 3-20 | 0.0017-0.003 | 0.002-0.003 |
| Cesium | 1.5 | - | - | - | <DL | <DL |
| Chromium | 250 | 20-30 | 10-200 | 10-30 | 0.008-0.079 | 0.003-0.11 |
| Cobalt | 7500 | 50-5000 | 10-5000 | 3-500 | 0.001-0.064 | 0.001-0.080 |
| Copper | 3200 | 20-3000 | 10-200 | 5-50 | 0.006-0.32 | 0.003-0.062 |
| Fluorine | 40 | 3-100 | 10-2000 | 2-20 | 0.023-0.3 | 0.021-0.25 |
| Lanthanum | 1000 | - | 1-500 | 2-10 | <DL | <DL |
| Lead | 13,000 | 3-650 | 0.3-55 | 0.2-1.5 | 0.012-0.026 | 0.011-0.025 |
| Lithium | 200 | - | 30-300 | 50-300 | 0.07-0.44 | 0.064-0.48 |
| Nickel | 40,000 | 20-5000 | 50-5000 | 10-100 | 0.012-0.037 | 0.003-0.006 |
| Selenium | 50 | - | - | - | <DL | 1.0 |
| Strontium | 250 | 50-200 | 30-500 | 50-300 | 0.49-10 | 0.21-11 |
| Uranium | 15,000 | 1000-145,000 | - | - | 0.006-0.012 | 0.006-1.2 |

†[1] The values given are the concentration ranges above the detection limits for those samples that gave positive results. <DL means that no positive result was observed.

†[2] Average of values for residues in east and west bays of Building 411.

†[3] It is not clear whether offsite ditch samples were taken, or whether the results given are limited to onsite samples only.

Source: Ausmus et al. (1980--Tables 3.2, 5.1, 6.6, and 6.7).

Table 5. Governmental Agencies with Potential Regulatory Control Over the Proposed NFSS Interim Remedial Action

| | |
|---|---|
| <u>Federal</u> | |
| | Nuclear Regulatory Commission |
| | Environmental Protection Agency |
| | Department of Energy |
| | Department of Transportation |
| | Corps of Engineers |
| <u>State of New York</u> | |
| | Department of Environmental Conservation |
| | Department of Health |
| | Department of Labor |
| | Department of Transportation |
| | Energy Research and Development Authority |
| <u>Niagara County</u> | |
| | Finance, Public Health, and Public Safety Committee |
| | Health Department |
| | Board of Health |
| | Environmental Management Council |
| | Planning Board |
| <u>Town of Lewiston</u> | |
| | Town Board |
| | Building and Zoning Inspector |
| | Zoning Board of Appeals |
| | Environmental Conservation Committee |

Data from Politech Corporation (1980).

Table 6. Mitigative Measures and Monitoring That Will Be Part of the Proposed Action

- Controls over further spread of contamination--including establishment of contamination control zones, use of temporary plastic sheeting to cover uncontaminated sides of ditches and truck loading area, use of seamless trucks or truck liners when hauling wet ditch materials, decontamination of vehicles and equipment, erosion and runoff control measures, and worker monitoring.
- Routine watering of excavation areas and the R-10 pile storage area, as necessary during dry conditions, to preclude excessive dust.
- If the check dam/dewatering system is used for ditch excavation, covering the downstream dam of contaminated materials with a tarp, straw, or other material to preclude erosion of the dam materials downstream into uncontrolled areas.
- Prompt seeding and mulching of disturbed areas to minimize erosion; use of scarification and jute netting, as necessary, in ditches.
- Standard contamination and worker radiation-exposure controls; education and training of workers with regard to radiation risks and health-physics procedures; use of breathing apparatus for work in Building 411.
- Routing of trucks hauling contaminated materials one-way along temporary haul roads back to the site; decontamination and restoration of haul roads and repair of other public and private roads, as necessary.
- Use of a flagman on Balmer Road near the Lutts Road and central ditch crossing area to aid in the safe movement of construction equipment across Balmer Road; avoidance of residential areas when transporting backfill; scheduling construction traffic during offpeak hours.
- Air and water quality monitoring for radioactive substances; installation of a water-level monitoring device in Building 411 and routine water-level checks; monitoring of the water from Building 411 for radiological and nonradiological substances prior to discharge, and treatment (as necessary) to reduce concentrations of radionuclides to DOE operating limits and concentrations of nonradiological substances to state discharge limits.
- Sampling and analysis of central ditch sediments from the vicinity of SCA Chemical Waste Services for selected metals and organic compounds; reevaluation of potential nonradiological hazards; revision of the proposed action, mitigating measures, and monitoring, if necessary.
- Monitoring the surface of the R-10 pile for bulges, cracks, or other signs of any buildup of decomposition gases under the EPDM/clay/soil cover.
- Informing local authorities, nearby property owners, and concerned citizens of the proposed action; designating a public liaison person; courteous treatment of site visitors; assurance to interested persons that the public will be involved in any decision-making concerning the long-term, permanent disposition of the site.
- Informing property owners of intended actions along the central drainage ditch; courteous respect for their property rights and interests.

Table 7. Cumulative Radiation Doses to Selected Members of the General Public Near the R-10 Pile During Proposed FY 83 Actions†[1]

| Description of Person | Location of Person | Dose (mrem) | | | |
|---|---|---|---|---|---|
| | | Whole Body | Bone | Lung | Bronchial Epithelium |
| KOA campground visitor (1-week visit) | 0.7 km SSW | <0.010 | 0.018 | 0.014 | 0.022 |
| KOA campground attendant | 0.7 km SSW | 0.20 | 0.35 | 0.38 | 0.57 |
| Nearest permanent resident | 1.1 km SW | 0.015 | 0.14 | 0.15 | 0.20 |
| Trailer park resident | 2.6 km NW | 0.015 | 0.037 | 0.035 | 0.040 |
| SCA Chemical Waste Services worker | 1.2 km NNE | 0.027 | 0.39 | 0.42 | 0.32 |

†[1] Bases for radiological analysis are given in the text.

Table 8. Comparison of Doses to SCA Chemical Waste Services Worker to Doses from Other Sources†[1]

| From Proposed Action | Compares With |
| --- | --- |
| 0.027 mrem (whole body) | Riding 5 minutes in a jet plane at 10,000 m (33,000 ft) because of increase in cosmic radiation with altitude |
| | Staying for the same amount of time as the remedial action (6 months) at 1.8-m (5-ft) higher altitude |
| 0.39 mrem (bone) | 36 mrem received from natural sources (background) over the same period of time (6 months) |
| 0.42 mrem (lung) | 260 mrem received from background over the same period of time |

†[1] Conversion factors given in the Argonne National Laboratory (1982) report.

REFERENCES

Acres American Incorporated. 1981a. Niagara Falls Storage Site, Remedial Projects: Draft Design Transmittal, Spoils Retrieval. Prepared by NLO, Inc. (National Lead of Ohio, Inc.), by Acres American Inc., Buffalo, NY. September 1981.

Acres American Incorporated. 1981b. Hydrologic and Geologic Characterization of the DOE-Niagara Falls Storage Site. Prepared for NLO, Inc. (National Lead of Ohio, Inc.) by Acres American Inc., Buffalo, NY. September 1981.

Acres American Incorporated. 1981c. Niagara Falls Storage Site, Remedial Projects: Status Report, Spoils Impoundment Facility; Draft Status Report, Water Retention/Treatment Facility; Design Transmittal, Vehicle Decontamination Facility; Design Transmittal, Remedial Measures for Buildings 413/414; Draft Design Transmittal, Evaluation of K-65 Tower. Prepared for NLO, Inc. (National Lead of Ohio, Inc.), by Acres American Inc., Buffalo, NY. September - November 1981.

Anderson, T.L., et al. 1981. A Comprehensive Characterization and Hazard Assessment of the DOE-Niagara Falls Storage Site. Final Report. Prepared for the U.S. Department of Energy by Battelle Columbus Laboratories, Columbus, OH. June 1981. 3 v.

Argonne National Laboratory. 1982. Methods for Assessing Environmental Impacts of a Property-Cleanup/Interim-Storage Remedial Action. ANL/EIS-16. Prepared for the Formerly Utilized Sites Remedial Action Program, U.S. Department of Energy, Oak Ridge, TN, by the Division of Environmental Impact Studies, Argonne National Laboratory, Argonne, IL.

Ausmus, B.S., et al. 1980. Comprehensive Radiological Survey of the DOE-Niagara Falls Storage Site. Interim Summary Report. Prepared for the U.S. Department of Energy by Battelle Columbus Laboratories, Columbus, OH. August 1980.

Ausmus, B. 1981. Letter (Battelle Columbus Laboratories) to E. Delaney (U.S. Department of Energy), May 21, 1981.

Battelle Columbus Laboratories. 1980. An Engineering Assessment of the Drainage System and a Preliminary Investigation of Waste Impoundment Facilities at the DOE-Niagara Falls Storage Site. Prepared for the U.S. Department of Energy by Battelle Columbus Laboratories, Columbus, OH. December 1980.

Bechtel National, Inc. 1982a. Bid Package: Stabilization of the R-10 Spoils Pile at Niagara Falls Storage Site. Subcontract No. 414501-SC-14.

Bechtel National, Inc. 1982b. Field Change Order, R-10 Stabilization, Cut-Off Wall and Holding Ponds. Subcontract No. 14501-SC-12, FCO No. SC-12-13.

Bechtel National, Inc. 1982c. Bid Package: Remedial Work on Buildings 413 and 414 at Niagara Falls Storage Site. Subcontract No. 414501-SC-15.

Bechtel National, Inc. 1982d. Bid Package: Work Addition to Stabilization of the R-10 Spoils Pile at Niagara Falls Storage Site. Subcontract No. 14501-__-__.

Bechtel National, Inc. 1982e. Niagara Falls Storage Site. Long-Range Planning Study, Phase I. Surplus Facilities Management Program. Prepared for the U.S. Department of Energy by Bechtel National Inc. February 1982.

Bechtel National, Inc. 1982f. Niagara Falls Storage Site. Long-Range Planning Study, Phase II. Prepared for U.S. Department of Energy by Bechtel National Inc. Preliminary Draft, July 1982.

Bechtel National, Inc. 1983. Personal communication.

Cavendish, J.H., et al. 1978. Scoping Investigation of Alternate Methods for Disposal of Radioactive Residues at the DOE-Niagara Falls Site. National Lead Company of Ohio. September 1978.

Interstate Commerce Commission. 1981. Supplemental Draft Environmental Impact Statement, Finance Docket No. 29255, Somerset Railroad Corporation--Construction, Acquisition and Operation--of Line of Railroad in Niagara County, New York. Prepared by Interstate Commerce Commission, Office of Policy and Analysis, Energy and Environmental Branch; and Tera Corporation. October 1981.

LaFalce, J.J. 1980. Letter (U.S. House of Representatives) to D.L. Turner (Buffalo Courier-Express) regarding the former Lake Ontario Ordnance Works site.

Levesque, R. 1982. Personal communication to P. Merry-Libby, Argonne National Laboratory, from R. Levesque. Bechtel National Inc. August 26, 1982.

Ludlam, J. 1982. Personal communication (New York Department of Environmental Conservation, Division of Hazardous Wastes, Albany, NY) to P. Benioff (Argonne National Laboratory).

New York Department of Environmental Conservation. 1979. Draft Environmental Impact Statement for a SCA Chemical Waste Services, Inc., Facility, Model City, Niagara County, New York. Prepared by Fred C. Hart Associates, Inc., New York, NY. February 27, 1979.

Politech Corporation. 1980. New York State Information Handbook, Formerly Utilized Sites Remedial Action Program. Prepared for the U.S. Department of Energy by Politech Corporation, Washington, DC. December 1980.

U.S. Atomic Energy Commission. 1974. Environmental Assessment: Decontamination and Reduction of Site to a Minimum Area, AEC-Niagara Falls, Lewiston, New York. Prepared for the Oak Ridge Operations Office by National Lead Company of Ohio, Cincinnati, OH. September 1974.

U.S. Department of Energy. 1982a. Action Description Memorandum, Niagara Falls Storage Site, Proposed 1982 Interim Remedial Action (R-10 Pile Stabilization). Oak Ridge Operations, Technical Services Division, Oak Ridge, Tennessee. April 1982.

U.S. Department of Energy. 1982b. Action Description Memorandum, Niagara Falls Storage Site, Proposed Interim Remedial Action for Buildings 413 and 414. Oak Ridge Operations, Technical Services Division, Oak Ridge, Tennessee. April 1982.

U.S. Department of Energy. 1982c. Final Environmental Impact Statement, Long-Term Management of Liquid High-Level Radioactive Wastes at the Western New York Nuclear Service Center, West Valley. DOE/EIS-0081. June 1982.

U.S. Department of Housing and Urban Development. 1980. National Flood Insurance Program, Firm Flood Insurance Rate Map, Town of Lewiston, New York, Niagara County. Community-Panel No. 360502-0005-B, Panel 5 of 10. June 18, 1980.

U.S. Environmental Protection Agency. 1977. Compilation of Air Pollutant Emission Factors. Third Edition. Office of Air and Waste Management, Research Triangle Park, N. Carolina, August 1977.

U.S. Geological Survey. 1965. 7.5 min. Topographic Maps, 1:25,000 scale. Ransomville, Lewiston, Fort Niagara, and Sixmile Creek (New York) Quadrangles.

Zweig, M.P., and G.M. Boyd. 1981. The Federal Connection: A History of United States Military Involvement in the Toxic Contamination of Love Canal and the Niagara Frontier Region. Interim Report to New York State Assembly Speaker, Stanley Fink. January 1981.

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Oak Ridge, Tennessee 37830

Dear Lowell:

I am enclosing, on behalf of the Town of Lewiston, New York, the written comments of the Town in response to the scoping notice which appeared in the Federal Register on February 1, 1983, concerning the Niagara Falls Storage Site. These comments should be considered as a supplement and addition to the oral comments made on behalf of the Town at the scoping meeting held in Lewiston on February 17.

I would ask that you or someone from your office or Argonne National Laboratory review these written comments and notify me in writing, at your earliest convenience, specifically which of the Town's recommendations will be studied in preparation of the draft EIS. I make this request in order that the Town will have an adequate opportunity to evaluate the draft EIS and to undertake whatever information-gathering is necessary in order to prepare for such evaluation.

Thank you for this opportunity to comment.

Sincerely,

James M. McElfish, Jr.

Enclosure

cc: Benjamin Hewitt, Esq.
Mary Beth Brado, Town Clerk
New York State Department of
Environmental Conservation

## COMMENTS OF THE
## TOWN OF LEWISTON, NEW YORK

The Town of Lewiston is the unwilling repository for numerous "low-level" radioactive waste materials generated from the Manhattan Project. Many of these materials were brought in during the 1940's and '50's from St. Louis and other places for disposal even though the Niagara Falls Storage Site (NFSS) clearly fails to meet the criteria for a disposal site. (Indeed it fails to meet any of the current DOE proposed guidelines or EPA guidelines for such areas.)

Nearly half the waste on the site is stored there solely for the convenience of the African Metals Corporation ("Afrimet"), which is currently under an obligation to remove this material by June 30, 1983. Afrimet, which is subject to the regulatory and licensing authority of the State of New York Department of Labor and Department of Environmental Conservation (NYSDEC), as well as to its lease with the United States Department of Energy (DOE), should be compelled to comply with the terms of its license and its lease. Its materials under that license and lease should be removed and decontamination accomplished at Afrimet's expense; Afrimet may not "dispose" of these materials on the site without a license from NYSDEC. Any deals struck between DOE and Afrimet must also be subjected to review under the NEPA process, inasmuch as any such agreement could represent an irreversible or irretrievable commitment of resources having significant environmental impacts. The

Town cautions DOE against subverting the NEPA process by undertaking to make major decisions involving Afrimet totally outside the NEPA context and hereby requests full disclosure as to the ongoing Afrimet negotiations, and an opportunity to participate in that process.

The Town of Lewiston urges two fundamental principles which should be kept in mind during the preparation of the EIS: (1) Under no circumstances should the NFSS be considered for disposal of additional waste. The Federal Register notice announcing the scoping meeting stated that this would not be one of the options studied. Under 40 CFR 1501.7(a)(5), of course, DOE must disclose any environmental impact statements which are or will be prepared but which are not within the scope of this particular statement. (2) No irreversible or irretrievable commitments should be made under the name of "interim handling". Any study of an "interim" option must consider the ease with which such a decision can be "undone" in the future for decontamination and decommissioning of the site.

The Town requests that the Environmental Impact Statement include, at a minimum, analysis of the following items. An analysis lacking any of these items would be insufficient to inform the decisionmaker.

A. Alternatives Analysis of Available Regulatory Standards.

1. The EIS should identify where DOE dose, exposure and concentration standards differ from NRC, EPA and State of New York standards, and for each alternative and sub-alternative evaluate the effect of applying the differing standard.

2. The EIS should specifically address the design specifications of the EPA mill tailing regulations (40 CFR Part 192) and the radiological limitations therein, evaluating for alternatives (1) and (2) and all relevant sub-alternatives their utility and their effect should they be applied by DOE to the NFSS.

3. The EIS should specifically address the NRC regulations for Land Disposal of Low-Level Radioactive Wastes (10 CFR Part 61), and particularly the design criteria therein, evaluating for alternatives (1) and (2) and all relevant sub-alternatives their utility and their effect should they be applied by DOE to the NFSS.

4. The EIS should specifically address the New York State standards at 12 NYCCR 38, 6 NYCCR 380, and 10 NYCCR 16, evaluating for all alternatives their utility and their effect should they be applied either by DOE or directly by the State to the NFSS.

5. The EIS should discuss compliance with the New York SPDES program and State Implementation Plan (SIP) under the Clean Air Act, and evaluate whether each alternative will comply with the standards thereunder (whether or not the programs themselves are legally applicable to the alternative chosen).

B. Site-Specific Data Needed.

1. The EIS should discuss in detail the hydrology associated with the site, should include mapping of the relevant aquifers, dye tracing studies, rate and direction of sub-surface flow, and analysis of surface flow, and should analyze existing hydrologic contamination.

2. The EIS should produce <u>hydrologic impacts</u> analyses for <u>each</u> alternative or sub-alternative studied, showing the paths and levels of contamination. (This was not done in the prior Acres American study.) It is insufficient simply to have a chapter of the EIS on hydrology, without having an analysis which <u>applies</u> that chapter specifically to the waste dispositions under each alternative.

3. The EIS should discuss the geology of the site and focus specifically on identification and <u>location</u> of rock fractures, windows, and lenses. Seismic activity should be discussed.

4. The EIS should discuss precipitation, including the effects of <u>100-year storm events</u>, and other potential meteorological impacts, on the alternatives and sub-alternatives discussed.

5. The EIS should address the impact of the site's flood plain and/or Lake Ontario location with respect to each alternative and sub-alternative.

6. The EIS should reflect air dispersion <u>modeling</u> for the site with respect to contaminants for <u>each</u> alternative and sub-alternative.

7. The EIS should discuss the effect of the 1982-84 "remedial work" and what constraints that imposes on the decision-making process and the alternatives analysis.

8. The EIS should include a current off-site survey to determine radiation exposure for surrounding privately owned and government owned land. The EIS should report results of all ongoing monitoring and compare it to past monitoring.

C. <u>Afrimet Wastes</u>.

1. The EIS should discuss alternatives for

dealing with the Afrimet materials separately, and for imposing or enforcing monetary, regulatory and decontamination obligations upon Afrimet.

2. The lease negotiations should be discussed and reviewed in detail.

3. The no-action alternative should include that of allowing the lease to expire and <u>compelling</u> Afrimet to remove its materials.

4. All discussions of economics should also include evaluation of Afrimet's financial obligations and liability for remedial actions, transportation, etc.

D. <u>Impacts</u>.

1. The EIS should study health impacts upon the local population, both from past and present contamination, and with respect to <u>each</u> of the alternatives and sub-alternatives studied.

2. The EIS should study psychological impacts of the proposed alternatives on the residents of the Town in terms of both "perceptions", <u>and</u> from a qualified health-impact analysis perspective.

3. The EIS should focus specifically on the impact of each alternative and sub-alternative upon nearby residences and on the Lewiston-Porter School complex located only less than one mile from the site. Previous studies have not focused on this facility (<u>e.g</u>. the 1983 Action Description Memorandum says of the area west of the site only that: "Hunters occasionally use the area...", overlooking the schools completely).

4. The EIS should address the impact of each alternative and sub-alternative for its effect on:

(a) the tax base of the community
(b) the attraction and retention of new industry
(c) construction and sale of new residential housing developments (both under construction and potential)
(d) the infrastructure of the Town of Lewiston
(e) the essential character of Lewiston as a residential community already under stress.

5. Although the option of transporting additional waste to the site is not to be studied as an alternative in this EIS, the EIS must identify and quantify as an adverse impact on the community any increased likelihood of such an eventuality potentially resulting from alternatives (1) or (2).

E. Additional Alternatives.

1. The EIS should include discussion of alternatives involving permanent removal of portions of the most dangerous waste (i.e. the Afrimet waste; and/or the R-10 waste) as a sub-alternative to alternatives (1) and (2). The EIS should also specifically include an alternative requiring Afrimet to remove its waste, and DOE undertaking either permanent removal or temporary storage remaining Government-owned waste.

2. The EIS should discuss alternative disposal sites in addition to Oak Ridge and Hanford, including the Nevada Testing Site, Savannah River, Idaho Falls, and new sites not yet designated. Among these should be the alternative of relocating these materials to uranium mill-tailing disposal sites.

3. The EIS should discuss, as a sub-alternative of alternative (1), alternative methods of handling the material on site during short term storage. This study should include analysis of above-ground containerized storage that will allow ease of removal when eventual permanent disposition is decided upon.

F. Mitigation.

1. The EIS should discuss air, water and radiation mitigation measures available to reduce the hazards associated with each of the alternatives and sub-alternatives.

G. Economic Analysis.

1. All cost data, studies and estimates to be used in determining the ultimate choice among alternatives should be presented in the EIS for public comment and review. All conflicting cost data or estimates should be specifically identified and discussed.

The Town hereby requests from DOE a brief written response stating with respect to each scoping recommendation, whether or not DOE intends to include the Town's recommendation for study or, if not, its reasons for deciding not to do so. This will provide a clear indication of what the Town may expect to be covered or not covered in the draft EIS, and will assist the Town in deciding what further action may be necessary, including any studies it needs to pursue on its own or with the assistance of the State of New York. The Town would appreciate receiving such a response within 60 days in order to assist it in implementing its own decision-making process.

TOWN OF LEWISTON

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