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# **Town of Tonawanda Landfill and Mudflats Area**

*Vicinity Property of the  
Linde FUSRAP Site*

*September 1, 1999*

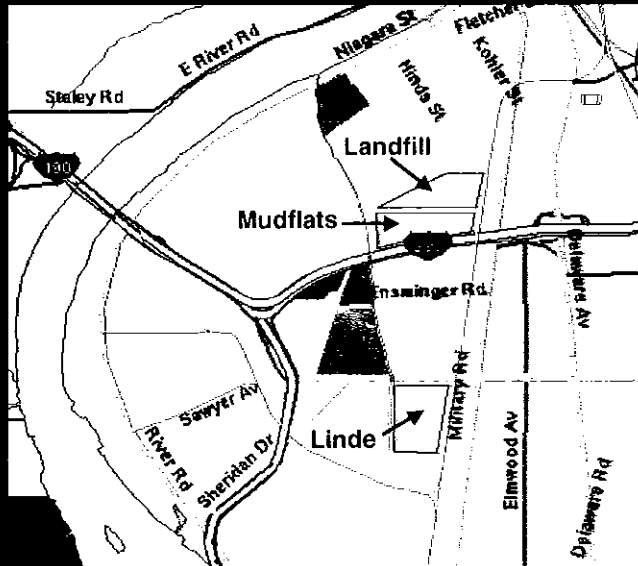
## **Purpose of Presentation**

- Present the information Buffalo District has on the Landfill and Mudflats
- Examine some unresolved issues



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## Tonawanda Landfill and Mudflats Area



- Location of Tonawanda Landfill and Mudflats Area with respect to the Linde Site.

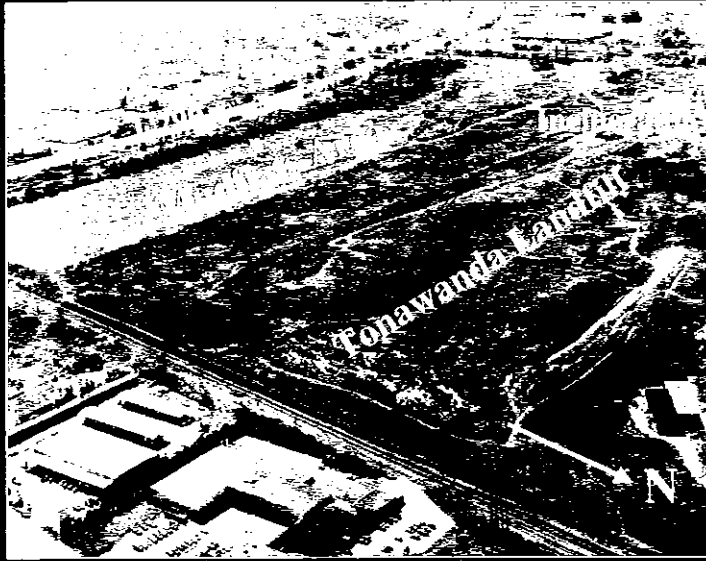
- Boundaries

- North - Residential - City of Tonawanda
- South - Interstate 290
- West - East Park Drive
- East - Conrail Line
- Divided by Niagara Mohawk Right-of-Way



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## Tonawanda Landfill and Mudflats Area



- Aerial photo of the Tonawanda Landfill and Mudflats Area.
- Size
  - Landfill - 55 acres
  - Mudflats - 115 acres



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## Tonawanda Landfill and Mudflats Area

### Site Background

- Town of Tonawanda Landfill
  - Operated by Town from mid-1930s to 1989.
  - Accepted waste included incinerator ash, municipal solid waste, sewage treatment plant sludge, and leaves.
- Mudflats Area
  - Incinerator at western end of Mudflats Area operated by Town of Tonawanda from 1940s to early 1980s.
  - Incinerator burned municipal solid waste and sewage treatment plant sludge.
- No known MED activities at either location.  
Source of contamination is unknown.

#### •Landfill

- Primary waste stream was incinerator ash from Town's incinerators.
- When incinerators were not operating, material went straight to the landfill.

#### •Mudflats Area

- Undeveloped property owned by Town of Tonawanda.
- Incinerator burned sewage treatment plant sludge from Town's wastewater treatment plant.

#### •Currently unknown how contamination ended up in the Landfill and Mudflats

- No records indicating how it got there
- Theory 1 - Wastewater from Linde activities discharged to Two Mile Creek - Two Mile Creek dredged at some point (by Town?) - Dredged material deposited in Landfill
- Theory 2 - Wastewater from Linde activities discharged to sewer system - Radionuclides settled out in sludge at WWTP - Sludge incinerated and placed in Landfill



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## Tonawanda Landfill and Mudflats Area

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### Previous Investigations

- 1990 Mobile Gamma Scanning Survey (DOE)
  - Survey of area surrounding Linde Site to assess whether residual materials were transported off-site.
  - Anomaly detected in Mudflats Area.
- 1991 Radiological Site Survey (DOE)
  - Detailed characterization of Landfill and Mudflats.
  - Identified isolated locations with soil concentrations of Ra-226, Th-230, and U-238 above DOE guidelines. Material similar to by-product from Linde processing.
  - Portions of property with MED-related contamination designated as FUSRAP Vicinity Property.

#### •1990 Mobile Gamma Survey

- Mobile gamma scanning van surveyed streets surrounding Linde and route from Linde to Landfill.
- Any anomalies were verified with portable, hand-held gamma scintillators.
- Soil sample collected from areas with elevated gamma levels and analyzed.

#### •1991 Radiological Survey

- Surface gamma scan with portable gamma scintillator meters.
- Surface and subsurface soil samples collected from systematic grid.
- Biased soil samples collected from locations with elevated gamma exposure rates.
- Material found was uranium ore and waste products from the processing of uranium ore.
- Vicinity Property designation limited to areas with uranium and uranium decay products from activities related to DOE's predecessors.



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### Previous Investigations (continued)

- 1994 Additional Site Characterization (DOE)
  - Conducted to determine depth of MED contamination at locations identified in 1991 survey.
  - MED contamination detected above guidelines to depth of 11.5 feet in one location in Landfill.
  - Remainder of MED contamination within upper 1.5 feet.

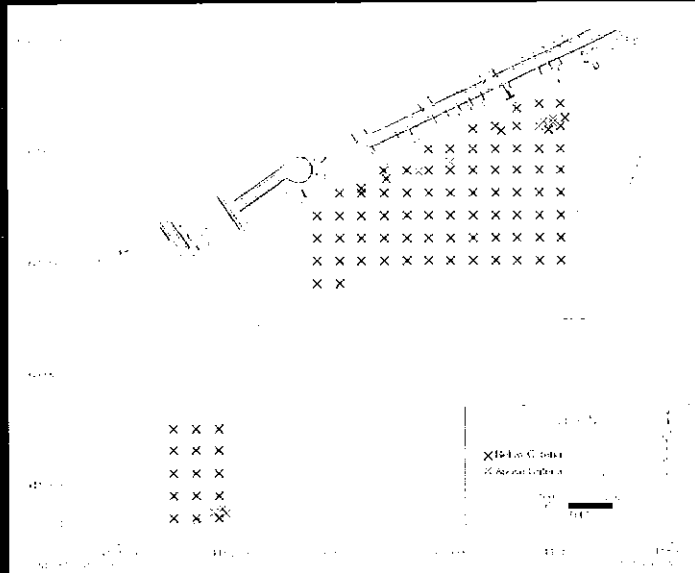
- 1994 Site Characterization

- Boreholes drilled to depth of undisturbed material and samples collected along length of boring.
- Groundwater samples collected from two of the boreholes.



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## Tonawanda Landfill and Mudflats Area



- Figure incorporates data from 1990, 1991, and 1994 investigations
- Criteria Used:
  - Ra-226 and Th-230 - 5 pCi/g averaged over first 15 cm, 15 pCi/g averaged over 15 cm layer below the surface layer
  - U-238 - 60 pCi/g over any 15 cm layer

*Volume*

*Landfill 10,100 cy*

*Mudflats 1700 cy*



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## Tonawanda Landfill and Mudflats Area

### Previous Investigations (continued)

- 1999 Human Health Assessment (USACE)
  - Evaluated doses and risks to human health for current site use, as well as potential closure scenarios.
  - Dose and risk for recreational user under current site conditions are as follows:

	Dose	Risk
Landfill	10 mrem/yr	$5.4 \times 10^{-5}$
Mudflats	2.9 mrem/yr	$1.5 \times 10^{-5}$

- Dose and risk are within guidelines.

- Used RESRAD (Residual Radioactivity) computer model to determine doses for several scenarios.
  - Exposure point concentrations determined through statistical analysis of existing data - Assume uniform concentration over 2 foot thick layer
  - Exposure pathways for scenarios were identified
  - Parameters based on published guidelines - Chosen to provide conservative estimate
- Landfill scenarios included recreational user for current conditions, recreational user if landfill is capped, construction worker capping the landfill, and remediation worker excavating the contaminated soil.
- Mudflats scenarios included recreational and industrial user for current conditions, recreational and industrial user if contamination is covered with 6 inches of soil, and remediation worker excavating the contaminated soil.
- Guidelines
  - NRC - 10CFR20 - 25 mrem/yr
  - TAGM - 10 mrem/yr
  - CERCLA Cancer Risk Guideline -  $10^{-4}$  to  $10^{-6}$





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### Issues

- **Groundwater**
  - One of two samples collected from shallow aquifer by DOE had radionuclides above guidelines.
  - Sample collected from open borehole - high sediments.
  - No radionuclides above guidelines in monitoring wells sampled biannually by Town of Tonawanda.
  - Aquifer is not used for drinking water.
  - Migration potential limited, as radiological COCs are generally insoluble, and soils are generally silt and clay.
  - **MED contamination unlikely to pose a threat to groundwater. Further documentation may be required.**

- Shallow aquifer - 5 to 15 feet below ground surface.
- Samples had high level of sediments - could lead to higher levels detected than what is actually in the groundwater.
- Monitoring well info based on conversation with Town Engineer Roy Svensson.
- Silt and clay soils - radionuclides in groundwater would tend to adsorb to soil.



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### Issues (continued)

- **Extent of Landfill Contamination**
  - DOE investigations examined limited portion of landfill.
  - Eastern portion investigated for Am-241 by Town of Tonawanda.
  - Samples collected by NYSDEC from five locations in the Am-241 contaminated area did not contain Ra-226, U-238, Th-230 above guidelines.
  - **Extent of MED contamination within DOE-sampled area is well defined. Extent outside of area is uncertain.**

- DOE's rationale for sampling locations is unknown.



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### Issues (continued)

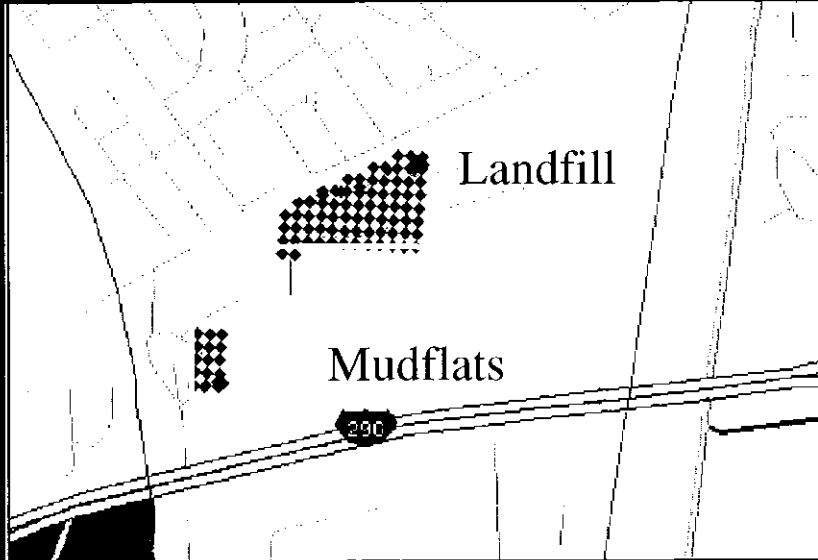
- **Extent of Mudflats Contamination**
  - DOE investigations examined small portion of the site near the incinerator.
  - No other sampling conducted in Mudflats Area.
  - **Extent of MED contamination within DOE-sampled area is well defined. Extent outside of area is uncertain.**

- DOE's rationale for sampling locations is unknown.



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## Tonawanda Landfill and Mudflats Area



- Figure roughly depicts DOE sampling with respect to entire Landfill and Mudflats properties.



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### **Decision on Lead Agency**

- USACE may address MED contamination under FUSRAP authority, following the CERCLA process.
- Town of Tonawanda may address MED contamination as part of the landfill closure and seek reimbursement from Federal Government.
- **Town must make decision on lead agency before remediation process can continue.**

- Since the site was designated by the DOE as a FUSRAP Vicinity Property, USACE has the authority to remediate the site.
- As the site owner, the Town of Tonawanda is required to close the landfill under a consent order with the NYSDEC.
- The Town must decide if it wants to address the contamination. If they do not, then it falls to the Corps to address it.



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### **CERCLA Process**

- Remedial Investigation
  - Historical records search and data review
  - Field sampling
  - Baseline risk analysis
- Feasibility Study
  - Propose and evaluate remedial alternatives
- Proposed Plan/Record of Decision
  - Public review and comment
- Remedial Design/Remedial Action

- Historical Records Search & Data Review
  - Determine source of material to better predict extent of MED contamination
  - Review existing data to determine what additional data is required
- Field Sampling
  - Gamma walkover survey
  - Surface and subsurface soil sampling - systematic and biased
- Baseline Risk Analysis
  - Refine doses and risks to human health for closure scenarios
  - Supports evaluation of alternatives in Feasibility Study
- Feasibility Study
  - Propose remediation alternatives and evaluate according to CERCLA



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### Estimated CERCLA Schedule

<u>Action Item</u>	<u>Completion Date*</u>
Remedial Investigation	Mar. 2001
Feasibility Study	Oct. 2001
Proposed Plan	Feb. 2002
Public Review/Issue ROD	July 2002
RD/RA	Dec. 2003

\* Assumes start date of Oct. 1999

- Approximately 4 years to go from start of RI/FS to completion of Remedial Action
- Assumes adequate funding. Landfill and Mudflats are not currently funded or in the budget.