

Preliminary Estimate of Unaccounted Industrial Slag and Radiological Fill

Niagara-Buffalo region | Manhattan Project and Cold War industrial legacy | Updated July 19, 2026

600,000 to 1,500,000 tons	approximately 1,000,000 tons
Revised investigative working range	Planning midpoint for visualization

This is a working regional model, not a verified inventory. The range was expanded to account for the newly separated Union Carbide slag/fill stream and the broader number of nuclear-related factories with incomplete waste accounting. The line items below must not be added mechanically because some quantities may overlap.

Estimated and documented components

Source or waste stream	Quantity / status	What the number represents	Confidence
Oldbury / Hooker phosphorus slag	300,000-700,000 tons estimated locally distributed	Modeled range based on decades of phosphorus production and company records stating that practically all Oldbury slag was sold for driveways, streets, parking lots, and similar construction. This is not an official production total.	Moderate
Union Carbide slag and fill	250,000-500,000 tons working estimate	Investigative range based on historical accounts of extensive commercial hauling, landfill disposal, and reuse beneath parking lots and other construction. The tonnage is not yet supported by surviving production ledgers or a complete disposal inventory.	Low-Moderate
Linde uranium-processing tailings	About 8,000 tons documented original tailings	Low-grade uranium ore tailings transferred from Linde to the Haist / Ashland property. Later dispersion contaminated a much larger mass of ordinary soil.	High
Electro Metallurgical process slag	About 800 tons theoretical minimum	Calculated magnesium-fluoride slag from production of 1,538 tons of uranium metal. Excludes furnace linings, uranium-bearing scrap, rejected batches, contaminated equipment, and other residues.	Moderate
Niagara Falls Boulevard cleanup	About 28,000 tons documented removal	Low-level radiological waste excavated from confirmed slag fill at parking lots and buildings. This may represent part of a larger regional slag stream and should not automatically be added as a separate source.	High
Carborundum nuclear-related operations	Unknown - not assigned a tonnage	Carborundum conducted uranium extraction and recovery research, nuclear-fuel and uranium work, and plutonium-related research or fabrication. Waste was reportedly transported to LOOW, but current records do not support a defensible mass estimate.	Low for quantity; high for documented activity
Other factories and recovery operations	Unknown	Includes Simonds / Guterl, Titanium Alloys / former NL Industries, other Union Carbide operations, Bell-related material streams where documented, radioactive-material recovery work, industrial landfills, and undocumented fill movement.	Low

Interpretation of the revised range

The earlier estimate of 300,000-700,000 tons applied to Oldbury / Hooker phosphorus slag alone. The first all-facility model placed the regional total at approximately 400,000 to 1 million tons. The revised working range is **600,000 to 1.5 million tons**, with a planning midpoint near **1 million tons**.

The revision does not establish that an additional half-million tons have been proven. It recognizes that Union Carbide's slag and fill stream should be modeled separately, while Carborundum and several other nuclear-related operations remain unquantified. The upper end therefore represents an investigative ceiling for planning, archival research, and visualization - not a measured quantity.

Why Union Carbide changes the model

Historical investigator interviews and later reporting describe Union Carbide slag as widely hauled, sold, buried, and reused as construction fill. Accounts that substantial portions of local parking areas contained Union Carbide slag imply a regional distribution practice rather than a small, isolated disposal event. Because no complete annual production, hauling, or destination records have yet been assembled, the proposed 250,000-500,000-ton range remains a low-to-moderate-confidence model.

Why Carborundum matters but is not assigned tonnage

Carborundum's documented work included uranium-related processing and research, nuclear-fuel development, and plutonium-related activity. These operations could have produced contaminated ceramics, furnace residues, filters, scrap, process chemicals, equipment, soil, and laboratory waste. However, knowledge that radioactive materials were handled does not by itself establish the mass of waste produced. Assigning a tonnage before locating production ledgers, shipping records, waste manifests, or process-specific mass-balance data would create false precision.

Why factory totals cannot simply be added

Factory throughput is not the same as waste production. Cleanup quantities are also not equivalent to original waste quantities. A relatively small amount of concentrated residue can contaminate a much larger volume of soil, asphalt, rubble, sediment, or demolition debris after it is transported and mixed. Conversely, some material may appear in more than one historical record - first as factory waste, later as fill, and later again as cleanup tonnage.

Recommended language for reporting

Company records, historical investigations, and cleanup data suggest that at least several hundred thousand tons of industrial slag and radiologically affected fill were dispersed, buried, reused, or left without complete destination records across Western New York. A revised investigative all-facility range is approximately 600,000 to 1.5 million tons, with a planning midpoint near 1 million tons. Oldbury / Hooker phosphorus slag and Union Carbide slag likely account for much of the modeled mass. Carborundum and several other nuclear-related operations remain unquantified because complete production and disposal records have not yet been located.

Important limitation

"Unaccounted for" does not mean that every ton is dangerously radioactive. It means that the material's destination, composition, and present radiological condition were not comprehensively documented or tested. The term also includes ordinary soil, asphalt, rubble, or sediment that may have become radiologically affected after mixing with smaller quantities of concentrated industrial residue.

Research framework and source notes

Evidence class	Definition	How it should be used
Documented quantity	A quantity stated in a government, company, engineering, or cleanup record.	May be reported directly, while noting whether it represents original waste, mixed soil, or removed material.
Process-derived calculation	A quantity inferred from known production and chemical stoichiometry.	Use as a minimum or modeled estimate; identify excluded waste streams.
Historical distribution model	A range inferred from years of operation, reuse practices, hauling accounts, and incomplete destination records.	Present as an investigative range with explicit uncertainty.
Unquantified documented activity	Radioactive or nuclear-related work is documented, but production and disposal masses are unavailable.	Describe the activity and likely waste types without assigning tonnage.

Priority records needed to improve the estimate

- Annual production ledgers for phosphorus, ferroalloy, uranium, and nuclear-material operations.
- Union Carbide slag sales, trucking contracts, landfill logs, and customer or destination records.
- Carborundum uranium, plutonium, nuclear-fuel, and recovery project records, including waste shipments to LOOW.
- LOOW / NFSS incoming-shipment inventories, burial logs, damaged-container reports, and outgoing transfers.
- Municipal paving, parking-lot, road-base, and demolition records identifying industrial slag or fill sources.
- Original radiological survey laboratory tables that distinguish uranium, radium, thorium, cesium-137, cobalt-60, plutonium, and other radionuclides.

Source notes

1. Hooker Chemical, November 30, 1978, with internal memorandum: states that complete records did not exist, employees recalled slag sales throughout Western New York, and practically all Oldbury slag was sold for driveways, streets, parking lots, and similar uses.
2. U.S. Department of Energy, Manhattan Project histories: Linde supplied a major portion of uranium-processing material; Electro Metallurgical produced approximately 1,538 tons of uranium metal.
3. U.S. Army Corps of Engineers, Ashland 1 documentation: approximately 8,000 tons of original Linde uranium tailings were transferred to the Haist property; later excavation involved a much larger volume of contaminated soil.
4. U.S. EPA, Niagara County radiation-removal documentation: approximately 28,000 tons of low-level radiological waste were removed from Niagara Falls Boulevard properties.
5. Oak Ridge National Laboratory regional survey reporting: identified numerous additional anomalies associated with phosphate slag used beneath asphalt driveways, parking lots, and general gravel applications.
6. Historical private-investigator interviews and later reporting concerning Union Carbide: describe extensive commercial hauling, sale, burial, and reuse of slag, but do not provide a verified production total.
7. Carborundum historical and federal worker-study records: document uranium-related work, nuclear-fuel research or fabrication, and plutonium-related activity; current records reviewed do not provide a defensible total waste mass.

Method note: This all-facility estimate is an investigative model assembled from documented quantities, process chemistry, cleanup records, company statements, historical interviews, and known gaps in cradle-to-grave accounting. It should be revised whenever original production ledgers, shipping manifests, recovery records, disposal files, or verified survey results are located.