Fresh Kills Landfill

GRB has been working closely with the City of New York since 1985. It has worked on over 100 projects focusing on environmental studies and analysis related to natural resource damages, marine and terrestrial ecological systems, environmental impact statements, environmental assessments, environmental permitting, database management, GIS mapping, record keeping, hazardous materials and hazardous waste sites. GRB performed environmental studies on multiple landfill leachate discharges to The Jamaica Bay Wildlife Refuge—part of Gateway National Recreation Area.

The Fresh Kills Landfill was a landfill covering 2,200 acres in New York City (Staten Island) along the banks of the Fresh Kills estuary. The landfill open in 1947 as a temporary landfill but soon grew into the City's principal landfill for solid waste disposal. Over time it grew into the world's largest landfill and largest man made structure.

For the Fresh Kills Landfill, GRB provided both permitting and EIS technical support to the New York City Department of Sanitation on the permitting, upgrade, and closure of the landfill. The project value for this work effort was $600 million. As the permitting process was very controversial, elements of the EIS and Part 360 permit were expanded to encompass the following elements:

- Project Description
- Land Use, Zoning, and Public Policy
- Socioeconomic Conditions
- Community Facilities
- Open Space and Recreational Facilities
- Shadows
- Landfill Operations
- Landfill Gas Migration AND Control
- Landfill Leachate Collection System
- Solid Waste Management
- Storm water Management
- Landfill Closure
- Landfill Dynamics
- Closure and Post Closure
- Wetlands
- Aquatic Ecology
- Geology/Hydrogeology
- Landfill Monitoring
- Historic Resources
- Urban Design and Visual Resources

- Neighborhood Character
- Natural Resources
- Hazardous Materials
- Water Front Revitalization
- Infrastructure
- Solid Waste Sanitation Services
- Energy
- Traffic and Parking
- Transit and Pedestrians
- Air Quality
- Noise
- Construction
- Public Health
- Alternatives
- Impact Avoidance Measures and Mitigation
- Unavoidable Significant Adverse Impacts
- Growth Inducing Impacts from Proposed Project
- Irreversible and Irretrievable Commitments of Resources
- Environmental Justice

Special studies included human health ris assessment air dispersion modeling, aquatic ecological surveys, wetland surveys, and hydrologic modeling.

SPDES/NPDES Permit

This permit consisted of two components, stormwater basin outfall monitoring and treatment plant effluent sampling. The SPDES permit (Permit No. NY 020 0867) issued to the NYCDOS for the Fresh Kills Landfill focused on both stormwater control basins and the leachate treatment plant outfalls. The permit was issued in

compliance with Title 8 of Article 17 of the Environmental Conservation Law of New York State, Clean Water Act, and was mandated by the 1990 Fresh Kills Consent Order (No. D2-9001-89-03, Appendix A, Subject 16). The permit identified the following outfalls to be monitored:

Outfall No.	Receiving Water Body/Receiving	Landfill	Water Classification	Location
001	Sleight Creek	SD		
002	Arthur Kill		SD	1/9
101	Main Creek	SC		3/4
102	Fresh Kills	SD		3/4
103	Fresh Kills	SD		3/4
104	Main Creek	SC		3/4
105	Richmond Creek	SC		2/8
106	Wetlands of Richmond Creek		SD	2/8
107	Richmond Creek	SC		2/8
108	Springfield Creek	SC		6/7
109	Wetlands of Springfield Creek	-		6/7
110	Wetlands of Richmond Creek		SD	6/7
111	Richmond Creek	SC		6/7
112	Richmond Creek	SC		6/7
113	Fresh Kills	SD		1/9
114	Great Fish Kills	SD		1/9
115	Wetlands of Richmond Creek		SD	1/9
116	Drainage Ditch of Sleight Creek	-		1/9
117	Arthur Kill		SD	1/9

Monitoring locations for the leachate treatment plant are identified as 001 (effluent process tank) and 002 (monitoring manhole station 5+19). The remaining outfalls (101 – 117) represent specific automatic sampling locations within the various stormwater control basins. Since the issuance of the SPDES permit, Outfall Number 001 has been abandoned.

The permit identified monitoring requirements, parameters, and frequency. The data are to be reported in Discharge Monitoring Reports on a quarterly basis. Permit compliance monitoring requirements are discussed in detailed in a Site-Wide Environmental Monitoring Plan (EMP, prepared by GRB) as well as inspection activity of the monitoring devises.

Site-Wide Environmental Monitoring Plan

The Fresh Kills Landfill Environmental Monitoring Program is comprehensive and encompassed 10 technical subtasks that required the sampling, analysis, and reporting of the various environmental systems in-placed at the Fresh Kills Landfill and adjacent environmental features. Environmental monitoring at the landfill was to occur during interim operations, closure, and post-closure periods in conformance with all attachments, applicable regulations, and the Order on Consent. Elements of the program included the following:

Groundwater Quality Monitoring Program (Monthly, Quarterly, Annual monitoring program and reporting requirements)

Surface Water, Sediment, and Small Tributary Quality Monitoring Program (Monthly, Quarterly, Annual monitoring program and reporting requirements)

Leachate Recovery Well Monitoring Program (Leachate samples shall be collected by Contractor personnel from Influent Pipe A which, receives landfill leachate from Section 1/9 and Influent Pipe B, which receives landfill leachate from Sections 6/7, 2/8, and ¾.)

Hydraulic Monitoring (collect water level elevation data in selected monitoring wells associated with the groundwater monitoring well system and leachate collection and containment system.)

Landfill Gas Migration Monitoring (The landfill gas migration monitoring system array includes landfill gas monitoring wells (103) and methane sensors (138) located in numerous buildings (64) within the Fresh Kills Landfill complex.)

SPDES/NPDES Compliance (This program consisted of two components, stormwater basin outfall monitoring and treatment plant effluent sampling)

Component Integration for Environmental Assessment Report **(**The Long-Term Monitoring program of the Fresh Kills Landfill was a large complex integrated study designed to comply with NYSDEC Part 360 regulations and the requirements set forth in the Order on Consent. In order for the Department to continue compliance into the future, make necessary program improvements, and to effectively implement the Long-Term Monitoring program, the program required the following reports on an annual basis: Department: Regulatory Compliance Report, Facility Management Reports, Exceptions Reports)

Analytical Reports (Benthic Ecological, Groundwater, Surface Water, Sediment Analysis Reports)

Well Management Program (perform a visual inspection of monitoring wells, and any sampling equipment within, associated with the groundwater, hydraulic monitoring program, landfill gas monitoring, and facility monitoring; repair work)

Development and Revisions of SOPs, QAPP's, and HASPs **(**As the long term monitoring program progresses, it will be necessary for the Contractor to revise the QAPP, SAP, and/or HASP, and to either modify or develop new SOPs in response to the long-term data, changes in site conditions, and/or changes in regulations).

Based on the findings of the EIS and public comments, the City of New York decided to close the landfill. As such, the work was followed by landfill closure planning. This work required closure design, park design, and a subsequent EIS and Supplemental EIS. Once the world's largest landfill, Fresh Kills will be the largest park in NYC consisting of 2,200 acres.