<table>
<thead>
<tr>
<th>ARAR Type</th>
<th>Requirement</th>
<th>Status</th>
<th>Summary of Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Action-Specific</td>
<td>New Jersey Air Pollution Control Rules (N.J.A.C. 7:27)</td>
<td>Potentially Applicable - to remedial activities generating certain air emissions</td>
<td>Establishes standards for the emissions of contaminants into [the ambient atmosphere] air.</td>
</tr>
<tr>
<td>Action-Specific</td>
<td>Clean Air Act (42 U.S.C subsections 7401 et seq)</td>
<td>Potentially Applicable - to remedial activities generating certain air emissions</td>
<td>Establishes standards for the emissions of contaminants into [the ambient atmosphere] air.</td>
</tr>
<tr>
<td>Action-Specific</td>
<td>Guide to Management of Investigation-Derived Wastes (OSWER Publication 9345.3-03FS)</td>
<td>To Be Considered</td>
<td>Present regulatory background and options for managing investigation-derived waste at Superfund sites.</td>
</tr>
<tr>
<td>Action-Specific</td>
<td>New Jersey Field Sampling Procedures Manual, Appendix 6.1, New Jersey Well Standards</td>
<td>To Be Considered</td>
<td>Establishes standards for the construction, maintenance, and sampling of monitoring wells.</td>
</tr>
<tr>
<td>Action-Specific</td>
<td>New Jersey Noise Control Rules (N.J.A.C. 7:29)</td>
<td>Relevant and Appropriate</td>
<td>Prohibits the generation of certain types of noise at specific times and establishes methods to determine compliance.</td>
</tr>
<tr>
<td>Action-Specific</td>
<td>New Jersey Brownfield and Contaminated Site Remediation Act (N.J.S.A. 58:18-1 et seq.)</td>
<td>Applicable</td>
<td>Enabling legislation for development of remediation standards necessary to protect public health and safety and the environment from discharged hazardous substances and for mandating cleanup of contaminated sites.</td>
</tr>
<tr>
<td>Action-Specific</td>
<td>New Jersey Technical Requirements for Site Remediation (N.J.A.C. 7:26E)</td>
<td>Applicable</td>
<td>Establishes the technical requirements for the remediation of contaminated sites.</td>
</tr>
<tr>
<td>Action-Specific</td>
<td>Administrative Requirements for the Remediation of Contaminated Sites (N.J.A.C. 7:26C)</td>
<td>Applicable</td>
<td>Requirements related to New Jersey's site remediation process.</td>
</tr>
<tr>
<td>Action-Specific</td>
<td>Green Remediation: Incorporating Sustainable Environmental Practices in Remediation of Contaminated Sites (OSWER Publication EPA 542-R-08-002)</td>
<td>To Be Considered</td>
<td>Outlines the principals of green remediation and describes opportunities to reduce the footprint of cleanup activities throughout the life of a project. Identifies new strategies and alternatives to improve sustainability of cleanup activities, and helps decision-makers balance the alternatives within existing regulatory frameworks.</td>
</tr>
<tr>
<td>Action-Specific</td>
<td>RCRA Subtitle D Landfills (40 CFR Parts 239-239)</td>
<td>Applicable</td>
<td>These regulations apply to non-hazardous waste landfills, including municipal solid waste landfills</td>
</tr>
<tr>
<td>Action-Specific</td>
<td>Additional, Specific Disposal Regulation for Sanitary Landfills (N.J.A.C. 7:26-2A)</td>
<td>Applicable</td>
<td>State regulations that include the requirements for closure and post-closure of sanitary landfills.</td>
</tr>
<tr>
<td>ARAR Type</td>
<td>Requirement</td>
<td>Status</td>
<td>Summary of Requirement</td>
</tr>
<tr>
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</tr>
<tr>
<td>Action-Specific</td>
<td>New Jersey Solid Waste Rules (N.J.A.C 7:26)</td>
<td>Applicable</td>
<td>Governs the registration, operation, maintenance, and closure of sanitary landfills, other solid waste facilities, and solid waste transportation operations in the State of New Jersey.</td>
</tr>
<tr>
<td>Action-Specific</td>
<td>Presumptive Remedy for CERCLA Municipal Landfills (OSWER Directive No. 9355.0-49F)</td>
<td>To Be Considered</td>
<td>This guidance outlines a streamlined approach to the scoping (planning) stages of the RI/FS in the process of closing municipal landfills under CERCLA, with containment as the presumptive remedy. This directive also provides guidance regarding the appropriate level of detail appropriate for risk assessment of source areas and characterization of hot spots.</td>
</tr>
<tr>
<td>Action-Specific</td>
<td>New Jersey Water Pollution Control Act Regulations (N.J.A.C 7:14)</td>
<td>Relevant and Appropriate</td>
<td>Prohibits the discharge of any pollutant into the waters of the State without a valid permit.</td>
</tr>
<tr>
<td>Action-Specific</td>
<td>New Jersey Pollutant Discharge Elimination System Rules (N.J.A.C 7:14A)</td>
<td>Applicable</td>
<td>Establishes the framework under which NJDEP regulates the discharge of pollutants to the surface and groundwater’s of the State.</td>
</tr>
<tr>
<td>Action-Specific</td>
<td>New Jersey Department of Transportation (NJDOT) Standard Specifications – Soil Erosion and Sediment Control Measures (1996) (N.J.A.C. 16:25A-2.1 et seq.)</td>
<td>To Be Considered</td>
<td>NJDOT standards are typically used to develop the appropriate plans for sediment and soil erosion control required under New Jersey Soil Conservation Act.</td>
</tr>
<tr>
<td>Action-Specific</td>
<td>49 C.F.R. Hazardous Materials Transportation</td>
<td>Potentially Applicable – to waste streams transported offsite for disposal</td>
<td>Regulates transportation of hazardous materials in the United States under the Department of Transportation (49 CFR).</td>
</tr>
<tr>
<td>Action-Specific</td>
<td>Plant Protection Act (7 U.S.C. Section 2814)</td>
<td>Potentially Applicable - if remedy requires introducing vegetation to any portion of the site</td>
<td>Requires the use of integrated management systems to control or contain undesirable plant species. Applicable to on-site remedial activities to control, eradicate, or prevent or retard the spread of such weeds.</td>
</tr>
<tr>
<td>Action-Specific</td>
<td>Migratory Bird Treaty Act of 1918 (16 U.S.C. 703-712; 50 CFR 10.13)</td>
<td>Applicable</td>
<td>This Act makes it unlawful to “take, capture, kill,” or otherwise impact a migratory bird or any nest or egg of a migratory bird.</td>
</tr>
<tr>
<td>ARAR Type</td>
<td>Requirement</td>
<td>Status</td>
<td>Summary of Requirement</td>
</tr>
<tr>
<td>----------------</td>
<td>------------------------------------------------------------------------------</td>
<td>-------------------</td>
<td>----------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Chemical-Specific</td>
<td>Remediation Standards (N.J.A.C 7:26D, 7:9B, 7:9C) (See Note 1)</td>
<td>Applicable</td>
<td>Establishes the minimum standards for the remediation of soil, groundwater, and surface water.</td>
</tr>
<tr>
<td>Chemical-Specific</td>
<td>Federal Safe Drinking Water Act (SDWA) Maximum Contaminant Levels (40 CFR 141.11-.16, and .60-.63)</td>
<td>To Be Considered</td>
<td>Defines the quality criteria for public drinking water supplies.</td>
</tr>
<tr>
<td>Chemical-Specific</td>
<td>New Jersey Safe Drinking Water Act (SDWA) Maximum Contaminant Levels (N.J.S.A. 58:12A-1 et seq.)</td>
<td>To Be Considered</td>
<td>Defines the quality criteria for public drinking water supplies.</td>
</tr>
<tr>
<td>Chemical-Specific</td>
<td>NJDEP Site Remediation Program, Technical Guidance for the Attainment of Remediation Standards and Site-Specific Criteria September 24, 2012, Version 1.0.</td>
<td>To Be Considered</td>
<td>Guidance on alternate methods to achieve compliance with applicable remediation standards.</td>
</tr>
<tr>
<td>Chemical-Specific</td>
<td>EPA Human Health Assessment Cancer Slope Factors (CSFs)</td>
<td>To Be Considered</td>
<td>CSFs are developed by EPA for health effects assessments or evaluation by the Human Health Assessment Group. These values present the most up-to-date cancer risk potency information and are used to compute the individual incremental cancer risk resulting from exposure to carcinogens.</td>
</tr>
<tr>
<td>Chemical-Specific</td>
<td>NJDEP “NJDEP Ecological Screening Criteria.” March 2009.</td>
<td>To Be Considered</td>
<td>Provides Ecological Screening Criteria to be used as screening values in ecological assessments.</td>
</tr>
<tr>
<td>Chemical-Specific</td>
<td>RCRA Groundwater Protection Standards and Maximum Concentration Limits (40 CFR 264, Subpart F)</td>
<td>Applicable</td>
<td>Regulates release from the solid management unit (i.e. the landfill) and specifies the groundwater protection standards.</td>
</tr>
<tr>
<td>Chemical-Specific</td>
<td>NJDEP Groundwater Quality Standards (N.J.A.C. 7-9C)</td>
<td>Applicable</td>
<td>Establishes the minimum standards for the remediation of groundwater.</td>
</tr>
<tr>
<td>Location-Specific</td>
<td>New Jersey Flood Hazard Area Control (N.J.A.C 7.13)</td>
<td>Applicable</td>
<td>Sets forth the requirements governing activities in the flood hazard area or riparian zone of a regulated water.</td>
</tr>
<tr>
<td>Location-Specific</td>
<td>EPA’s 1985 “Policy on Floodplains and Wetlands Assessments for CERCLA Actions”.</td>
<td>To Be Considered</td>
<td>Requires that CERCLA actions meet the substantive requirements of Floodplain Management Executive Order (EO 11988) and Protection of Wetlands Executive Order (EO 1990).</td>
</tr>
<tr>
<td>Location-Specific</td>
<td>Executive Order 11988 Floodplain Management</td>
<td>To Be Considered</td>
<td>Requires federal agencies to avoid to the extent possible long- and short-term adverse impacts associated with the occupancy and modification of flood plains, and avoid support of floodplain development wherever there is a practicable alternative.</td>
</tr>
<tr>
<td>ARAR Type</td>
<td>Requirement</td>
<td>Status</td>
<td>Summary of Requirement</td>
</tr>
<tr>
<td>-------------------</td>
<td>------------------------------------------------------------------------------</td>
<td>----------------</td>
<td>------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Location-Specific</td>
<td>Establishment of a Classification Exception Area/Well Restriction Area (N.J.A.C. 7:9-6.6)</td>
<td>Applicable</td>
<td>Promulgated state regulations that include requirements for establishing a classification exception area/well restriction area where groundwater quality does not meet New Jersey groundwater quality criteria</td>
</tr>
<tr>
<td>Location-Specific</td>
<td>Ground Water Quality and Surface Water Standards (N.J.A.C 7:9).</td>
<td>Applicable</td>
<td>Regulates activities respecting protection and enhancement of ground water and surface water resources.</td>
</tr>
<tr>
<td>Location-Specific</td>
<td>Federal Water Pollution Control Act (FWPCA) (33 USC 1521 et seq.)</td>
<td>Applicable</td>
<td>Requires a permit from USACE and consideration by both the EPA and the USFWS before an application to dredge and fill may be enacted.</td>
</tr>
<tr>
<td>Location-Specific</td>
<td>Section 404 - Clean Water Act, as it pertains to wetlands</td>
<td>To Be Considered</td>
<td>Prohibits discharge of dredged or fill material into wetlands adjacent to navigable waters without a permit.</td>
</tr>
<tr>
<td>Location-Specific</td>
<td>Executive Order 11990 Protection of Wetlands</td>
<td>To Be Considered</td>
<td>Requires federal agencies to provide leadership and take action to minimize the destruction, loss, or degradation of wetlands, and to preserve and enhance the natural and beneficial values of wetlands.</td>
</tr>
<tr>
<td>Location-Specific</td>
<td>Endangered Species Act (16 USC 1531 et seq.)</td>
<td>Applicable</td>
<td>Requires that action be performed to conserve endangered species or threatened species.</td>
</tr>
<tr>
<td>Location-Specific</td>
<td>New Jersey Endangered Plant Species Program (N.J.A.C 7:5C)</td>
<td>Relevant and Appropriate</td>
<td>Identifies the official list of endangered plant species and establishes the program for maintaining and updating the list.</td>
</tr>
<tr>
<td>Location-Specific</td>
<td>New Jersey Division of Fish, Game, and Wildlife Rules (N.J.A.C 7:25)</td>
<td>Relevant and Appropriate</td>
<td>Supplements the statutes governing fish and game laws in the State of New Jersey.</td>
</tr>
<tr>
<td>Location-Specific</td>
<td>National Wildlife Refuge System Administration Act of 1968, as amended by the National Wildlife Refuge System Improvement Act of 1997</td>
<td>Applicable</td>
<td>This act and amendments governs the use and management of National Wildlife Refuges.</td>
</tr>
<tr>
<td>Location-Specific</td>
<td>Final Comprehensive Conservation Plan, Great Swamp National Wildlife Refuge, November 2014</td>
<td>To Be Considered</td>
<td>This plan present the management goals, objectives, and strategies that guide the management of the Great Swamp National Wildlife Refuge over the next 15 years.</td>
</tr>
<tr>
<td>Location-Specific</td>
<td>Wilderness Act of 1964 (16 USC 1131-1136)</td>
<td>Applicable</td>
<td>This act directs each agency administering designated wilderness to preserve the &quot;wilderness character&quot; of areas within the National Wilderness Preservation System (NWPS) and to manage the land for the &quot;use and enjoyment of the American people in a way that will leave those areas unimpaired to future use and enjoyment as Wilderness.</td>
</tr>
</tbody>
</table>
### Table 4-1

<table>
<thead>
<tr>
<th>ARAR Type</th>
<th>Requirement</th>
<th>Status</th>
<th>Summary of Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Location-Specific</td>
<td>Great Swamp Wilderness Act of 1968 (Public Law 90-532, September 28, 1968)</td>
<td>Applicable</td>
<td>Designates the eastern portion of the refuge, comprised of 3,660 acres, as the Wilderness Area.</td>
</tr>
<tr>
<td>Location-Specific</td>
<td>Refuge Recreation Act of 1962 (16 USC 460K-460K-4)</td>
<td>Applicable</td>
<td>Assures present or future recreational uses by the public on areas within national wildlife refuges.</td>
</tr>
<tr>
<td>Location-Specific</td>
<td>Floodplain Management and Wetlands Protection (40 CFR 6.302(a) and (b); 40 CFR 6, Appendix A)</td>
<td>Applicable</td>
<td>Requires agencies to perform certain measures to avoid the long and short term impacts associated with the destruction or modification of wetlands and floodplains.</td>
</tr>
<tr>
<td>Location-Specific</td>
<td>Federal Noxious Weed Act of 1974 (PL 93-629; 7 USC 2801, et seq)</td>
<td>Applicable</td>
<td>Requires the use of integrated management systems to control or contain undesirable plant species.</td>
</tr>
<tr>
<td>Location-Specific</td>
<td>Executive Order 13112. Management of Invasive Species</td>
<td>To Be Considered</td>
<td>Requires that federal agencies take certain actions to prevent introduction of invasive species and provide for their control.</td>
</tr>
<tr>
<td>Location-Specific</td>
<td>Fish and Wildlife Coordination Act (16 USC 661 - 667e)</td>
<td>Applicable</td>
<td>Requires actions to protect fish or wildlife when diverting, channeling, or modifying a stream.</td>
</tr>
<tr>
<td>Location-Specific</td>
<td>Fish and Wildlife Coordination Act Advisories.</td>
<td>To Be Considered</td>
<td>Advisories on the effects of pollutants and other activities on wildlife, including migratory birds and fish, and wildlife habitat authorized under the Fish and Wildlife Coordination Act.</td>
</tr>
</tbody>
</table>

Notes:
1. As described in a letter from Walter Mugdan of USEPA to Irene Kropp of NJDEP, dated 12 May 2010, New Jersey’s Soil Remediation Standards (SRS, including both the residential and non-residential scenarios) for direct contact (i.e., ingestion/dermal exposure) are potential ARARs, but will not be considered as ARARs if those standards are not generally applicable, but rather, can change on a site-by-site basis (USEPA, 2010).
Table 4-2
Potential Preliminary Remediation Goals for Soil in the Landfill
Rolling Knolls Landfill Superfund Site - Feasibility Study
Chatham, New Jersey

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>CAS Number</th>
<th>NJDEP Non-Residential Direct Contact Soil Remediation Standards (mg/kg)</th>
<th>ARS (mg/kg)</th>
<th>Federal Remediation Guideline - Residential (mg/kg)</th>
<th>Federal Remediation Guideline - Non-Residential (mg/kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,1-Biphenyl</td>
<td>92-52-4</td>
<td>240</td>
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<tr>
<td>1,1-dichloroethane</td>
<td>75-34-3</td>
<td>24</td>
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<tr>
<td>1,2,4-trichlorobenzene</td>
<td>120-82-1</td>
<td>820</td>
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</tr>
<tr>
<td>1,2-dichlorobenzene</td>
<td>95-50-1</td>
<td>59000</td>
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<tr>
<td>1,2-dichloroethane</td>
<td>107-06-2</td>
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<tr>
<td>1,3-dichlorobenzene</td>
<td>541-73-1</td>
<td>59000</td>
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<tr>
<td>1,4-dichlorobenzene</td>
<td>106-46-7</td>
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<tr>
<td>2,4-dimethylphenol</td>
<td>105-67-9</td>
<td>14000</td>
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<tr>
<td>2,4-dinitrophenol</td>
<td>51-28-5</td>
<td>1400</td>
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<tr>
<td>2,4-Dinitrotoluene</td>
<td>121-14-2</td>
<td>3</td>
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<tr>
<td>2-methylnaphthalene</td>
<td>91-57-6</td>
<td>2400</td>
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<tr>
<td>2-methylphenol</td>
<td>95-48-7</td>
<td>3400</td>
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<tr>
<td>4,4-DDD</td>
<td>72-54-8</td>
<td>13</td>
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<td>4,4-DDE</td>
<td>72-55-9</td>
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<td>4,4-DDT</td>
<td>50-29-3</td>
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<tr>
<td>4-methylphenol</td>
<td>106-44-5</td>
<td>340</td>
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<tr>
<td>a-BHC</td>
<td>319-84-6</td>
<td>0.5</td>
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<tr>
<td>Acenaphthene</td>
<td>83-32-9</td>
<td>37000</td>
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<tr>
<td>Acenaphthylene</td>
<td>208-96-8</td>
<td>300000</td>
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<td>Acetophenone</td>
<td>98-86-2</td>
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<tr>
<td>Aldrin</td>
<td>309-00-2</td>
<td>0.2</td>
<td>0.7</td>
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<tr>
<td>Anthracene</td>
<td>120-12-7</td>
<td>30000</td>
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<tr>
<td>Antimony</td>
<td>7440-36-0</td>
<td>450</td>
<td>830</td>
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<tr>
<td>Arsenic</td>
<td>7440-38-2</td>
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<tr>
<td>Barium</td>
<td>7440-39-3</td>
<td>59000</td>
<td></td>
<td></td>
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<tr>
<td>b-BHC</td>
<td>319-85-7</td>
<td>2</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Benzo(a)anthracene</td>
<td>56-55-3</td>
<td>17</td>
<td>87</td>
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<tr>
<td>Benzoaldehyde</td>
<td>100-52-7</td>
<td>68000</td>
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<tr>
<td>Benzenes</td>
<td>71-43-2</td>
<td>5</td>
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<tr>
<td>Benzo(a)pyrene</td>
<td>50-32-8</td>
<td>2</td>
<td>9</td>
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<tr>
<td>Benzo(b)fluoranthene</td>
<td>205-99-2</td>
<td>17</td>
<td>87</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Benzo(g,h,i)perylene</td>
<td>191-24-2</td>
<td>30000</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## Table 4-2

Potential Preliminary Remediation Goals for Soil in the Landfill

Rolling Knolls Landfill Superfund Site - Feasibility Study
Chatham, New Jersey

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>CAS Number</th>
<th>NJDEP Non-Residential Direct Contact Soil Remediation Standards (mg/kg)</th>
<th>ARS (mg/kg)</th>
<th>Federal Remediation Guideline - Residential (mg/kg)</th>
<th>Federal Remediation Guideline - Non-Residential (mg/kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Benzo(k)fluoranthene</td>
<td>207-08-9</td>
<td>170</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Beryllium</td>
<td>7440-41-7</td>
<td>140</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Bis(2-chloroethyl)ether</td>
<td>111-44-4</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bis(2-ethylhexyl)phthalate</td>
<td>117-81-7</td>
<td>140</td>
<td>670</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Butyl benzyl phthalate</td>
<td>85-68-7</td>
<td>14000</td>
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<td></td>
</tr>
<tr>
<td>Cadmium</td>
<td>7440-43-9</td>
<td>78</td>
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</tr>
<tr>
<td>Caprolactam</td>
<td>105-60-2</td>
<td>340000</td>
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<tr>
<td>Carbazole</td>
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<td>CAS Number</td>
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<td>ARS (mg/kg)</td>
<td>Federal Remediation Guideline - Residential (mg/kg)</td>
<td>Federal Remediation Guideline - Non-Residential (mg/kg)</td>
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<td>3424-82-6</td>
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**Table 4-2**

Potential Preliminary Remediation Goals for Soil in the Landfill

Rolling Knolls Landfill Superfund Site - Feasibility Study

Chatham, New Jersey

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>CAS Number</th>
<th>NJDEP Non-Residential Direct Contact Soil Remediation Standards (mg/kg)</th>
<th>ARS (mg/kg)</th>
<th>Federal Remediation Guideline - Residential (mg/kg)</th>
<th>Federal Remediation Guideline - Non-Residential (mg/kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>trans-1,3-dichloropropene</td>
<td>542-75-6</td>
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<td>10</td>
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<tr>
<td>Trichlorofluoromethane</td>
<td>75-69-4</td>
<td>340000</td>
<td></td>
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<td></td>
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<tr>
<td>Vanadium</td>
<td>7440-62-2</td>
<td>1100</td>
<td>2100</td>
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<td>Vinyl chloride</td>
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<td>Xylene Total</td>
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Notes:
* The risk-based concentration (RBC) for PCBs is 10 mg/kg, however since the Alternate Remediation Standard is lower than the RBC, the ARS was selected as the PRG.

ARS - Alternate Remediation Standard
PRG - Preliminary Remediation Goal
CAS - Chemical Abstracts Service
NJDEP - New Jersey Department of Environmental Protection
mg/kg - milligrams per kilogram
### Table 4-3

**Preliminary Remediation Goals for Soil in the Landfill**  
Rolling Knolls Landfill Superfund Site - Feasibility Study  
Chatham, New Jersey

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>CAS Number</th>
<th>PRG (mg/kg)</th>
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<td>Acetophenone</td>
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<td>Antimony</td>
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<tr>
<td>Arsenic</td>
<td>7440-38-2</td>
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<tr>
<td>Benzo(a)anthracene</td>
<td>56-55-3</td>
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<tr>
<td>Benzo(a)pyrene</td>
<td>50-32-8</td>
<td>9</td>
</tr>
<tr>
<td>Benzo(b)fluoranthene</td>
<td>205-99-2</td>
<td>87</td>
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<td>Bis(2-ethylhexyl)phthalate</td>
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<td>Cadmium</td>
<td>7440-43-9</td>
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<tr>
<td>Carbon tetrachloride</td>
<td>56-23-5</td>
<td>24</td>
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<tr>
<td>Chlordane (cis)</td>
<td>5103-71-9</td>
<td>5</td>
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<tr>
<td>Chlordane (trans)</td>
<td>5103-74-2</td>
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<tr>
<td>Chloroform</td>
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<tr>
<td>Copper</td>
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<td>83000</td>
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<tr>
<td>Dibenzo(a,h)anthracene</td>
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<td>Dieldrin</td>
<td>60-57-1</td>
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<td>Heptachlor</td>
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<td>Heptachlor epoxide</td>
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<tr>
<td>Mercury</td>
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<tr>
<td>PCBs (Sum of total)</td>
<td>1336-36-3</td>
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<tr>
<td>Vanadium</td>
<td>7440-62-2</td>
<td>2100</td>
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</table>

**Notes:**  
* - The risk-based concentration (RBC) for PCBs is 10 mg/kg, however since the Alternate Remediation Standard (ARS) is lower than the RBC, the ARS was selected as the Preliminary Remediation Goal (PRG).  
CAS - Chemical Abstracts Service  
mg/kg - milligrams per kilogram
<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>CAS Number</th>
<th>NJDEP Residential Direct Contact Soil Remediation Standards (mg/kg)</th>
<th>ARS (mg/kg)</th>
<th>Federal Remediation Guideline - Residential (mg/kg)</th>
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## Table 4-4
Potential Preliminary Remediation Goals for Soil in the Baseball Field
Rolling Knolls Landfill Superfund Site - Feasibility Study
Chatham, New Jersey

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>CAS Number</th>
<th>NJDEP Residential Direct Contact Soil Remediation Standards (mg/kg)</th>
<th>ARS (mg/kg)</th>
<th>Federal Remediation Guideline - Residential (mg/kg)</th>
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<td></td>
</tr>
<tr>
<td>Nickel</td>
<td>7440-02-0</td>
<td>1600</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pentachlorophenol</td>
<td>87-86-5</td>
<td>0.9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pyrene</td>
<td>129-00-0</td>
<td>1700</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Silver</td>
<td>7440-22-4</td>
<td>390</td>
<td></td>
<td></td>
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<tr>
<td>Vanadium</td>
<td>7440-62-2</td>
<td>78</td>
<td></td>
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</tr>
<tr>
<td>Xylene Total</td>
<td>1330-20-7</td>
<td>12000</td>
<td></td>
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</tr>
<tr>
<td>Zinc</td>
<td>7440-66-6</td>
<td>23000</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Notes:
ARS - Alternate Remediation Standard
NS - No Standard
CAS - Chemical Abstracts Service
NJDEP - New Jersey Department of Environmental Protection
mg/kg - milligrams per kilogram
### Table 4-5

Preliminary Remediation Goals for Soil in the Baseball Field
Rolling Knolls Landfill Superfund Site - Feasibility Study
Chatham, New Jersey

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>CAS Number</th>
<th>PRG (mg/kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Benzo(a) pyrene</td>
<td>50-32-8</td>
<td>1</td>
</tr>
</tbody>
</table>

Notes:
- PRG - Preliminary Remediation Goal
- CAS - Chemical Abstracts Service
- mg/kg - milligrams per kilogram
**Table 4-6**

**Potential Preliminary Remediation Goals for Soil in the Shooting Range**

Rolling Knolls Landfill Superfund Site - Feasibility Study
Chatham, New Jersey

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>CAS Number</th>
<th>NJDEP Residential Direct Contact Soil Remediation Standards (mg/kg)</th>
<th>ARS (mg/kg)</th>
<th>Federal Remediation Guideline - Residential (mg/kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-methylnaphthalene</td>
<td>91-57-6</td>
<td>230</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acenaphthene</td>
<td>83-32-9</td>
<td>3400</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anthracene</td>
<td>120-12-7</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Antimony</td>
<td>7440-36-0</td>
<td>31</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Arsenic</td>
<td>7440-38-2</td>
<td>19</td>
<td></td>
<td></td>
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<tr>
<td>Barium</td>
<td>7440-39-3</td>
<td>16000</td>
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</tr>
<tr>
<td>Benz(a)anthracene</td>
<td>56-55-3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Benzo(a) pyrene</td>
<td>50-32-8</td>
<td>0.5</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Benzo(b)fluoranthene</td>
<td>205-99-2</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Benzo(g,h,i)perylene</td>
<td>191-24-2</td>
<td>380000</td>
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<td></td>
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<tr>
<td>Benzo(k)fluoranthene</td>
<td>207-08-9</td>
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</tr>
<tr>
<td>Beryllium</td>
<td>7440-41-7</td>
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</tr>
<tr>
<td>Cadmium</td>
<td>7440-43-9</td>
<td>78</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chrysene</td>
<td>218-01-9</td>
<td>450</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cobalt</td>
<td>7440-48-4</td>
<td>1600</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Copper</td>
<td>7440-50-8</td>
<td>3100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cyanide Total</td>
<td>57-12-5</td>
<td>47</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fluoranthene</td>
<td>206-44-0</td>
<td>2300</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Indeno(1,2,3-c,d)pyrene</td>
<td>193-39-5</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lead</td>
<td>7439-92-1</td>
<td>400</td>
<td>200</td>
<td></td>
</tr>
<tr>
<td>Manganese</td>
<td>7439-96-5</td>
<td>11000</td>
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<tr>
<td>Mercury</td>
<td>7439-97-6</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Naphthalene</td>
<td>91-20-3</td>
<td>6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nickel</td>
<td>7440-02-0</td>
<td>1600</td>
<td></td>
<td></td>
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<tr>
<td>n-Nitrosodiphenylamine</td>
<td>86-30-6</td>
<td>99</td>
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### Table 4-6
Potential Preliminary Remediation Goals for Soil in the Shooting Range
Rolling Knolls Landfill Superfund Site - Feasibility Study
Chatham, New Jersey

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>CAS Number</th>
<th>NJDEP Residential Direct Contact Soil Remediation Standards (mg/kg)</th>
<th>ARS (mg/kg)</th>
<th>Federal Remediation Guideline - Residential (mg/kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pyrene</td>
<td>129-00-0</td>
<td>1700</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Silver</td>
<td>7440-22-4</td>
<td>390</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vanadium</td>
<td>7440-62-2</td>
<td>78</td>
<td>180</td>
<td></td>
</tr>
<tr>
<td>Zinc</td>
<td>7440-66-6</td>
<td>23000</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Notes:
ARS - Alternate Remediation Standard
CAS - Chemical Abstracts Service
NJDEP - New Jersey Department of Environmental Protection
mg/kg - milligrams per kilogram
### Table 4-7
**Preliminary Remediation Goals for Soil in the Shooting Range**
Rolling Knolls Landfill Superfund Site - Feasibility Study
Chatham, New Jersey

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>CAS Number</th>
<th>PRG (mg/kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Benzo(a) pyrene</td>
<td>50-32-8</td>
<td>1</td>
</tr>
<tr>
<td>Vanadium</td>
<td>7440-62-2</td>
<td>180</td>
</tr>
</tbody>
</table>

Notes:
- CAS - Chemical Abstracts Service
- mg/kg - milligrams per kilogram
<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>CAS Number</th>
<th>New Jersey Ground Water Quality Standards (ug/L)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,1-dichloroethane</td>
<td>75-34-3</td>
<td>50</td>
</tr>
<tr>
<td>1,2,4-trichlorobenzene</td>
<td>120-82-1</td>
<td>9</td>
</tr>
<tr>
<td>1,2-dibromoethane</td>
<td>106-93-4</td>
<td>0.03</td>
</tr>
<tr>
<td>1,2-dichlorobenzene</td>
<td>95-50-1</td>
<td>600</td>
</tr>
<tr>
<td>1,3-dichlorobenzene</td>
<td>541-73-1</td>
<td>600</td>
</tr>
<tr>
<td>1,4-dichlorobenzene</td>
<td>106-46-7</td>
<td>75</td>
</tr>
<tr>
<td>1,4-Dioxane</td>
<td>123-91-1</td>
<td>0.4*</td>
</tr>
<tr>
<td>2,4-dimethylphenol</td>
<td>105-67-9</td>
<td>100</td>
</tr>
<tr>
<td>2-methylnaphthalene</td>
<td>91-57-6</td>
<td>30*</td>
</tr>
<tr>
<td>2-methylphenol</td>
<td>95-48-7</td>
<td>50</td>
</tr>
<tr>
<td>4,4-DDE</td>
<td>72-55-9</td>
<td>0.1</td>
</tr>
<tr>
<td>4-chloro-3-methylphenol</td>
<td>59-50-7</td>
<td>100*</td>
</tr>
<tr>
<td>4-methylphenol</td>
<td>106-44-5</td>
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</tr>
<tr>
<td>a-BHC</td>
<td>319-84-6</td>
<td>0.02</td>
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<tr>
<td>Acenaphthene</td>
<td>83-32-9</td>
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<td>Acenaphthylene</td>
<td>208-96-8</td>
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<tr>
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<tr>
<td>Aldrin</td>
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<td>0.04</td>
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<tr>
<td>Aluminum</td>
<td>7429-90-5</td>
<td>200</td>
</tr>
<tr>
<td>Anthracene</td>
<td>120-12-7</td>
<td>2000</td>
</tr>
<tr>
<td>Antimony</td>
<td>7440-36-0</td>
<td>6</td>
</tr>
<tr>
<td>Arsenic</td>
<td>7440-38-2</td>
<td>3</td>
</tr>
<tr>
<td>Barium</td>
<td>7440-39-3</td>
<td>6000</td>
</tr>
<tr>
<td>b-BHC</td>
<td>319-85-7</td>
<td>0.04</td>
</tr>
<tr>
<td>Benz(a)anthracene</td>
<td>56-55-3</td>
<td>0.1</td>
</tr>
<tr>
<td>Benzenephene</td>
<td>71-43-2</td>
<td>1</td>
</tr>
<tr>
<td>Benzo(a) pyrene</td>
<td>50-32-8</td>
<td>0.1</td>
</tr>
<tr>
<td>Benzo(b)flouranthene</td>
<td>205-99-2</td>
<td>0.2</td>
</tr>
<tr>
<td>Benzo(g,h,i)perylene</td>
<td>191-24-2</td>
<td>100*</td>
</tr>
<tr>
<td>Benzo(k)fluoranthene</td>
<td>207-08-9</td>
<td>0.5</td>
</tr>
<tr>
<td>Beryllium</td>
<td>7440-41-7</td>
<td>1</td>
</tr>
<tr>
<td>Bis(2-ethylhexyl) phthalate</td>
<td>117-81-7</td>
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</tr>
<tr>
<td>Butyl benzyl phthalate</td>
<td>85-68-7</td>
<td>100</td>
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<tr>
<td>Cadmium</td>
<td>7440-43-9</td>
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<tr>
<td>Caprolactam</td>
<td>105-60-2</td>
<td>3500*</td>
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<tr>
<td>Carbon disulfide</td>
<td>75-15-0</td>
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</tr>
<tr>
<td>Carbon tetrachloride</td>
<td>56-23-5</td>
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</tr>
<tr>
<td>Chlordane</td>
<td>5103-71-9</td>
<td>0.5</td>
</tr>
<tr>
<td>Chlorobenzene</td>
<td>108-90-7</td>
<td>50</td>
</tr>
</tbody>
</table>
Table 4-8

Potential Preliminary Remediation Goals for Groundwater at the Site
Rolling Knolls Landfill Superfund Site - Feasibility Study
Chatham, New Jersey

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>CAS Number</th>
<th>New Jersey Ground Water Quality Standards (µg/L)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chloroethane</td>
<td>75-00-3</td>
<td>5*</td>
</tr>
<tr>
<td>Chloroform</td>
<td>67-66-3</td>
<td>70</td>
</tr>
<tr>
<td>Chromium (III+VI)</td>
<td>7440-47-3</td>
<td>70</td>
</tr>
<tr>
<td>Chrysene</td>
<td>218-01-9</td>
<td>5</td>
</tr>
<tr>
<td>cis-1,2-dichloroethene</td>
<td>156-59-2</td>
<td>70</td>
</tr>
<tr>
<td>Cobalt</td>
<td>7440-48-4</td>
<td>100*</td>
</tr>
<tr>
<td>Copper</td>
<td>7440-50-8</td>
<td>1300</td>
</tr>
<tr>
<td>Cyanide Total</td>
<td>57-12-5</td>
<td>100</td>
</tr>
<tr>
<td>4,4-DDD</td>
<td>72-54-8</td>
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<tr>
<td>4,4-DDT</td>
<td>50-29-3</td>
<td>0.1</td>
</tr>
<tr>
<td>Dibenz(a,h)anthracene</td>
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<td>Dichlorodifluoromethane</td>
<td>75-71-8</td>
<td>1000</td>
</tr>
<tr>
<td>Diethylphthalate</td>
<td>84-66-2</td>
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<td>Di-n-butyl phthalate</td>
<td>84-74-2</td>
<td>700</td>
</tr>
<tr>
<td>Di-n-octyl phthalate</td>
<td>117-84-0</td>
<td>100</td>
</tr>
<tr>
<td>Endosulfan I</td>
<td>959-98-8</td>
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<tr>
<td>Endosulfan I and II</td>
<td>115-29-7</td>
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</tr>
<tr>
<td>Endosulfan II</td>
<td>33213-65-9</td>
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<td>72-20-8</td>
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<td>100-41-4</td>
<td>700</td>
</tr>
<tr>
<td>Fluoranthene</td>
<td>206-44-0</td>
<td>300</td>
</tr>
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<td>Fluorene</td>
<td>86-73-7</td>
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<tr>
<td>g-BHC (Lindane)</td>
<td>58-89-9</td>
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<td>Heptachlor</td>
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<tr>
<td>Indeno(1,2,3-c,d)pyrene</td>
<td>193-39-5</td>
<td>0.2</td>
</tr>
<tr>
<td>Iron</td>
<td>7439-89-6</td>
<td>300</td>
</tr>
<tr>
<td>Lead</td>
<td>7439-92-1</td>
<td>5</td>
</tr>
<tr>
<td>Manganese</td>
<td>7439-96-5</td>
<td>50</td>
</tr>
<tr>
<td>Mercury</td>
<td>7439-97-6</td>
<td>2</td>
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<tr>
<td>Methoxychlor</td>
<td>72-43-5</td>
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<td>Methyl acetate</td>
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<td>300</td>
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<td>MTBE</td>
<td>1634-04-4</td>
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<tr>
<td>Naphthalene</td>
<td>91-20-3</td>
<td>300</td>
</tr>
<tr>
<td>Nickel</td>
<td>7440-02-0</td>
<td>100</td>
</tr>
<tr>
<td>Nitrogen-nitrate and nitrite</td>
<td>BBL-N-Nitrate/Nitrit</td>
<td>10000</td>
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<tr>
<td>Chemical Name</td>
<td>CAS Number</td>
<td>New Jersey Ground Water Quality Standards (ug/L)</td>
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<tr>
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<td>------------</td>
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<tr>
<td>n-Nitrosodiphenylamine</td>
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<td>87-86-5</td>
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<td>Phenol</td>
<td>108-95-2</td>
<td>2000</td>
</tr>
<tr>
<td>Pyrene</td>
<td>129-00-0</td>
<td>200</td>
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<tr>
<td>Selenium</td>
<td>7782-49-2</td>
<td>40</td>
</tr>
<tr>
<td>Silver</td>
<td>7440-22-4</td>
<td>40</td>
</tr>
<tr>
<td>Sodium</td>
<td>7440-23-5</td>
<td>50000</td>
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<tr>
<td>Sulfate</td>
<td>14808-79-8</td>
<td>250000</td>
</tr>
<tr>
<td>Tetrachloroethene</td>
<td>127-18-4</td>
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<td>Thallium</td>
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<td>Toluene</td>
<td>108-88-3</td>
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<td>Total Dissolved Solids</td>
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<td>156-60-5</td>
<td>100</td>
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<tr>
<td>Trichloroethylene</td>
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<tr>
<td>Trichlorofluoromethane</td>
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<td>2000</td>
</tr>
<tr>
<td>Vinyl chloride</td>
<td>75-01-4</td>
<td>1</td>
</tr>
<tr>
<td>Xylene Total</td>
<td>1330-20-7</td>
<td>1000</td>
</tr>
<tr>
<td>Zinc</td>
<td>7440-66-6</td>
<td>2000</td>
</tr>
</tbody>
</table>

Notes:
CAS - Chemical Abstracts Service
ug/L - micrograms per liter
* - An asterisk denotes the standard is an Interim Ground Water Quality Criterion
Table 4-9  
Preliminary Remediation Goals for Groundwater at the Site  
Rolling Knolls Landfill Superfund Site - Feasibility Study 
Chatham, New Jersey

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>CAS Number</th>
<th>New Jersey Ground Water Quality Standards (ug/L)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,4-Dioxane</td>
<td>123-91-1</td>
<td>0.4*</td>
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<tr>
<td>Aluminum</td>
<td>7429-90-5</td>
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</tr>
<tr>
<td>Arsenic</td>
<td>7440-38-2</td>
<td>3</td>
</tr>
<tr>
<td>Benzene</td>
<td>71-43-2</td>
<td>1</td>
</tr>
<tr>
<td>Iron</td>
<td>7439-89-6</td>
<td>300</td>
</tr>
<tr>
<td>Lead</td>
<td>7439-92-1</td>
<td>5</td>
</tr>
<tr>
<td>Manganese</td>
<td>7439-96-5</td>
<td>50</td>
</tr>
<tr>
<td>Sodium</td>
<td>7440-23-5</td>
<td>50000</td>
</tr>
<tr>
<td>Thallium</td>
<td>7440-28-0</td>
<td>2</td>
</tr>
<tr>
<td>Vinyl chloride</td>
<td>75-01-4</td>
<td>1</td>
</tr>
</tbody>
</table>

Notes:  
CAS - Chemical Abstracts Service  
ug/L - micrograms per liter  
* - An asterisk denotes the standard is an Interim Ground Water Quality Criterion
### Table 5-1
**Areas of Particular Concern and Contaminants of Concern Driving Remediation**
Rolling Knolls Landfill Superfund Site - Feasibility Study
Chatham, New Jersey

<table>
<thead>
<tr>
<th>APC</th>
<th>COC Driving Remediation</th>
<th>Proposed ARS (mg/kg)</th>
<th>3x Proposed ARS (mg/kg)</th>
<th>COC Concentration (mg/kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>POI-9</td>
<td>Benzo(a)pyrene</td>
<td>9</td>
<td>27</td>
<td>33</td>
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<tr>
<td>POI-14</td>
<td>Lead</td>
<td>2,700</td>
<td>8,100</td>
<td>9,210</td>
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<tr>
<td>SS-90</td>
<td>PCBs</td>
<td>5</td>
<td>15</td>
<td>29</td>
</tr>
<tr>
<td>SS-97</td>
<td>PCBs</td>
<td>5</td>
<td>15</td>
<td>15.7</td>
</tr>
<tr>
<td>SS-103</td>
<td>Lead</td>
<td>2,700</td>
<td>8,100</td>
<td>13,800</td>
</tr>
<tr>
<td>SS-109/TP-09¹</td>
<td>Chloroform</td>
<td>10</td>
<td>30</td>
<td>1,900</td>
</tr>
<tr>
<td>SS-118</td>
<td>PCBs</td>
<td>5</td>
<td>15</td>
<td>23</td>
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</tbody>
</table>

**Notes:**
1. The analytical data for these locations was collected from SS-109, which is adjacent to test pit TP-09. Industrial wastes were observed within TP-09 and may be a source to groundwater. Therefore, both of these areas will be remediated.

- **APC** - Area of Particular Concern
- **ARS** - Alternate Remediation Standard
- **COC** - Contaminant of Concern
- **PCBs** - Polychlorinated Biphenyls
- **mg/kg** - milligrams per kilogram
<table>
<thead>
<tr>
<th></th>
<th>Soil Alternatives</th>
<th>1</th>
<th>2</th>
<th>3a</th>
<th>3b</th>
<th>3c</th>
<th>4a</th>
<th>4b</th>
<th>5</th>
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</thead>
<tbody>
<tr>
<td><strong>1. Overall Protection of Human Health and the Environment</strong></td>
<td></td>
<td></td>
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<td>Human Health Protection</td>
<td>NA</td>
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<td>4</td>
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<tr>
<td><strong>2. Compliance with ARARs</strong></td>
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<td>Location Specific ARARs</td>
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<td>Action Specific ARARs</td>
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<td><strong>3. Long-Term Effectiveness and Permanence</strong></td>
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<td></td>
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<tr>
<td>Magnitude of Residual Risk</td>
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<td>4</td>
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<tr>
<td>Adequacy and Reliability of Controls</td>
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<td>4</td>
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<tr>
<td><strong>4. Reduction of Toxicity, Mobility, and Volume Through Treatment</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td>Treatment Process used and Materials Treated</td>
<td>NA</td>
<td>1</td>
<td>1</td>
<td>1</td>
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<tr>
<td>Amount of Hazardous Materials Destroyed or Treated</td>
<td>NA</td>
<td>1</td>
<td>1</td>
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<td>1</td>
<td>1</td>
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<tr>
<td>Degree of Expected Reductions in Toxicity, Mobility or Volume through Treatment</td>
<td>NA</td>
<td>1</td>
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<td>Degree to which Treatment is Irreversible</td>
<td>NA</td>
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<td>Type and Quantity of Residuals Remaining after Treatment</td>
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<td>Whether the Alternative Would Satisfy the Statutory Preference for Treatment as a Principal Element</td>
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<td>----</td>
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<tr>
<td>Protection of Community During Remedial Actions</td>
<td>NA</td>
<td>4</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>1</td>
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<tr>
<td>Protection of Workers During Remedial Actions</td>
<td>NA</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>2</td>
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<td>Environmental Impacts</td>
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<td>Time Until Remedial Action Objectives are Achieved</td>
<td>NA</td>
<td>1</td>
<td>4</td>
<td>4</td>
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<td>Ability to Construct and Operate the Technology</td>
<td>NA</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>3</td>
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<tr>
<td>Reliability of the Technology</td>
<td>NA</td>
<td>4</td>
<td>4</td>
<td>4</td>
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<td>4</td>
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<tr>
<td>Ease of Undertaking Additional Remedial Actions, if necessary</td>
<td>NA</td>
<td>4</td>
<td>4</td>
<td>4</td>
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<td>3</td>
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<tr>
<td>Ability to Monitor Effectiveness of Remedy</td>
<td>NA</td>
<td>4</td>
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<tr>
<td>Ability to Obtain Approvals and Coordinate with Other Agencies</td>
<td>NA</td>
<td>4</td>
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<td>Availability of Off-Site Treatment, Storage, and Disposal Services and Capacity</td>
<td>NA</td>
<td>4</td>
<td>4</td>
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<td>2</td>
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<td>Availability of Necessary Equipment and Specialists</td>
<td>NA</td>
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<tr>
<td>Availability of Prospective Technology</td>
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</table>
Table 6-1
Comparative Analysis of Soil Remedial Alternatives
Rolling Knolls Landfill Superfund Site - Feasibility Study
Chatham, New Jersey

<table>
<thead>
<tr>
<th>Soil Alternatives</th>
<th>1</th>
<th>2</th>
<th>3a</th>
<th>3b</th>
<th>3c</th>
<th>4a</th>
<th>4b</th>
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<tbody>
<tr>
<td>7. Costs</td>
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<tr>
<td>Indirect Capital Cost</td>
<td>NA</td>
<td>4</td>
<td>3</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>1</td>
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<tr>
<td>Direct Capital Costs</td>
<td>NA</td>
<td>4</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>1</td>
<td>1</td>
<td>1</td>
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<tr>
<td>Post-Construction</td>
<td>NA</td>
<td>4</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Operation, Maintenance,</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>and Monitoring Costs</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Costs</td>
<td>NA</td>
<td>$761,000</td>
<td>$15,541,000</td>
<td>$17,390,000</td>
<td>$21,099,000</td>
<td>$32,426,000</td>
<td>$34,359,000</td>
<td>$54,261,000</td>
</tr>
<tr>
<td>8. State (or Support</td>
<td>TBE</td>
<td>TBE</td>
<td>TBE</td>
<td>TBE</td>
<td>TBE</td>
<td>TBE</td>
<td>TBE</td>
<td>TBE</td>
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<tr>
<td>Agency) Acceptance</td>
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<tr>
<td>9. Community Acceptance</td>
<td>TBE</td>
<td>TBE</td>
<td>TBE</td>
<td>TBE</td>
<td>TBE</td>
<td>TBE</td>
<td>TBE</td>
<td>TBE</td>
</tr>
</tbody>
</table>

Notes
1. Alternative Description:
   - Alternative 1 - No Action
   - Alternative 2 - Site Controls
   - Alternative 3a - Site Controls, Capping of Selected Area to Reduce Overall Risk, and Remediation (Consolidation Under Selected Area Cap) of Areas of Particular Concern (APCs), and Remediation of Non-Vegetated Areas with Soil Sample Results Above Remediation Goals
   - Alternative 3b - Site Controls, Capping of Selected Area to Reduce Overall Risk, and Remediation (Cap In-Place) of APCs, and Remediation of Non-Vegetated Areas with Soil Sample Results Above Remediation Goals
   - Alternative 3c - Site Controls, Capping of Selected Area to Reduce Overall Risk, and Remediation (Offsite Disposal) of APCs and Remediation of Non-Vegetated Areas with Soil Sample Results Above Remediation Goals
   - Alternative 4a - Site Controls, Excavation and Off-Site Disposal of Selected Area to Reduce Overall Risk, Remediation (Cap In-Place) of APCs, and Remediation of Non-Vegetated Areas with Soil Sample Results Above Remediation Goals
   - Alternative 4b - Site Controls, Excavation and Off-Site Disposal of Selected Area to Reduce Overall Risk, Remediation (Offsite Disposal) of APCs, and Remediation of Non-Vegetated Areas with Soil Sample Results Above Remediation Goals
   - Alternative 5 - Site Controls and Capping of All Landfill Material
2. TBE - To be evaluated. The findings from the detailed analysis of the State (or support agency) acceptance and Community acceptance criteria will be presented in ROD once USEPA completes their review of and provides comments on the final FS report.
3. Comparative analysis grading description: 1 - Poor, 2 - Moderate, 3 - Good, and 4 - Excellent
4. NA - Not applicable.
<table>
<thead>
<tr>
<th>ARAR Type</th>
<th>Requirement</th>
<th>Status</th>
<th>Summary of Requirement</th>
<th>Soil Remedy Alternatives</th>
</tr>
</thead>
<tbody>
<tr>
<td>Action-Specific</td>
<td>New Jersey Air Pollution Control Rules (N.J.A.C 7:27)</td>
<td>Potentially Applicable - to remedial activities generating certain air emissions</td>
<td>Establishes standards for the emissions of contaminants into the ambient atmosphere</td>
<td>1 NA WBCW WBCW WBCW WBCW WBCW WBCW</td>
</tr>
<tr>
<td>Action-Specific</td>
<td>Clean Air Act (42 U.S.C. subsections 7401 et seq)</td>
<td>Potentially Applicable - to remedial activities generating certain air emissions</td>
<td>Establishes standards for the emissions of contaminants into the ambient atmosphere</td>
<td>1 NA WBCW WBCW WBCW WBCW WBCW WBCW WBCW</td>
</tr>
<tr>
<td>Action-Specific</td>
<td>Occupation Safety and Health Standards and Safety and Health Regulations for Construction (29 C.F.R. 1926 and 1910)</td>
<td>Relevant and Appropriate – To remedy construction</td>
<td>Establishes occupational safety and health standards</td>
<td>1 NA WBCW WBCW WBCW WBCW WBCW WBCW WBCW</td>
</tr>
<tr>
<td>Action-Specific</td>
<td>Guide to Management of Investigation-Derived Wastes (OSWER Publication 9154.3-D185)</td>
<td>To Be Considered</td>
<td>Prevent regulatory background and options for managing investigation-derived waste at Superfund sites</td>
<td>1 NA WBCW (No IDW is anticipated but will be established as needed during the design phases) WBCW (No IDW is anticipated but will be established as needed during the design phases) WBCW (No IDW is anticipated but will be established as needed during the design phases) WBCW (No IDW is anticipated but will be established as needed during the design phases) WBCW (No IDW is anticipated but will be established as needed during the design phases) WBCW (No IDW is anticipated but will be established as needed during the design phases) WBCW (No IDW is anticipated but will be established as needed during the design phases)</td>
</tr>
<tr>
<td>Action-Specific</td>
<td>New Jersey Field Sampling Procedures Manual, Appendix G.1, New Jersey Well Standards</td>
<td>To Be Considered</td>
<td>Establishes standards for the construction, maintenance, and sampling of monitoring wells</td>
<td>1 NA NA NA NA NA NA NA NA</td>
</tr>
<tr>
<td>Action-Specific</td>
<td>New Jersey Noise Control Rules (N.J.A.C 7:29)</td>
<td>Relevant and Appropriate</td>
<td>Prohibits the generation of certain types of noise at specific times and establishes methods to determine compliance</td>
<td>1 NA WBCW WBCW WBCW WBCW WBCW WBCW WBCW</td>
</tr>
<tr>
<td>Action-Specific</td>
<td>New Jersey Brownfield and Contaminated Site Remediation Act (N.J.S.A. 58:1B-1 et seq.)</td>
<td>Applicable</td>
<td>Enables legislation for development of remediation standards necessary to protect public health and safety and the environment from discharged hazardous substances and for mandating cleanup of contaminated sites</td>
<td>1 NA NA WBCW WBCW WBCW WBCW WBCW WBCW</td>
</tr>
<tr>
<td>Action-Specific</td>
<td>New Jersey Technical Requirements for Site Remediation (N.J.A.C 7:26E)</td>
<td>Applicable</td>
<td>Establishes the technical requirements for the remediation of contaminated sites</td>
<td>1 NA WBCW WBCW WBCW WBCW WBCW WBCW WBCW</td>
</tr>
<tr>
<td>Action-Specific</td>
<td>Administrative Requirements for the Remediation of Contaminated Sites (N.J.A.C 7:26C)</td>
<td>Applicable</td>
<td>Requirements related to New Jersey's site remediation process</td>
<td>1 NA WBCW WBCW WBCW WBCW WBCW WBCW WBCW</td>
</tr>
<tr>
<td>Action-Specific</td>
<td>Green Remediation: Incorporating Sustainable Environmental Practices in Remediation of Contaminated Sites (OSWER Publication EPA 542-R-08-002)</td>
<td>To Be Considered</td>
<td>Outlines the principals of green remediation and describes opportunities to reduce the footprint of cleanup activities throughout the life of a project. Identifies new strategies and alternatives to improve sustainability of cleanup activities, and helps decision-makers balance the alternatives within existing regulatory frameworks</td>
<td>1 NA To be considered in the remedial action design To be considered in the remedial action design To be considered in the remedial action design To be considered in the remedial action design To be considered in the remedial action design To be considered in the remedial action design To be considered in the remedial action design</td>
</tr>
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</table>

Table 6-2
Summary of Compliance to Applicable, Relevant or Appropriate Requirements for Soil Alternatives
Rolling Knolls Landfill Superfund Site - Feasibility Study
Chatham, New Jersey
### Summary of Compliance to Applicable, Relevant or Appropriate Requirements for Soil Alternatives

**Rolling Knolls Landfill Superfund Site - Feasibility Study**  
Chatham, New Jersey

#### Soil Remedy Alternatives

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<thead>
<tr>
<th>ARRA Type</th>
<th>Requirement</th>
<th>Status</th>
<th>Summary of Requirement</th>
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<th></th>
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</thead>
<tbody>
<tr>
<td>Action-Specific</td>
<td>RCRA Subtitle D Landfills (40 CFR Parts 239 - 250)</td>
<td>Applicable</td>
<td>These regulations apply to non-hazardous waste landfills, including municipal solid waste landfills</td>
<td>NA</td>
<td>NA</td>
<td>Municipal waste is not the responsibility of the current PRPs and thus not applicable. However, any capping implemented as part of this alternative will comply with this ARAR</td>
<td>NA</td>
</tr>
<tr>
<td>Action-Specific</td>
<td>Additional, Specific Disposal Regulation for Sanitary Landfills (N.J.A.C. 7:26-2A)</td>
<td>To Be Considered</td>
<td>State regulations that include the requirements for closure and post-closure of sanitary landfills.</td>
<td>NA</td>
<td>NA</td>
<td>Municipal waste is not the responsibility of the current PRPs and thus not applicable. However, any capping implemented as part of this alternative will comply with this ARAR</td>
<td>NA</td>
</tr>
<tr>
<td>Action-Specific</td>
<td>New Jersey Solid Waste Rules (N.J.A.C. 7:26)</td>
<td>To Be Considered</td>
<td>Governs the registration, operation, maintenance, and closure of sanitary landfills, other solid waste facilities, and solid waste transportation operations in the State of New Jersey.</td>
<td>NA</td>
<td>NA</td>
<td>Municipal waste is not the responsibility of the current PRPs and thus not applicable. However, any capping implemented as part of this alternative will comply with this ARAR</td>
<td>NA</td>
</tr>
<tr>
<td>Action-Specific</td>
<td>Presumptive Remedy for CERCLA Municipal Landfills (OSWER Directive No. 9355.0-49F)</td>
<td>To Be Considered</td>
<td>This guidance outlines a streamlined approach to the scoping (planning) stages of the RI/FS in the process of closing municipal landfills under CERCLA, with containment as the presumptive remedy. This directive also provides guidance regarding the appropriate level of detail appropriate for risk assessment of source areas and characterization of hot spots.</td>
<td>NA</td>
<td>To Be Considered</td>
<td>To Be Considered</td>
<td>To Be Considered</td>
</tr>
<tr>
<td>Action-Specific</td>
<td>New Jersey Storm Water Management Rules (N.J.A.C 7:8)</td>
<td>Relevant and Appropriate</td>
<td>Establishes stormwater management requirements to prevent contamination of waterways via stormwater discharge.</td>
<td>NA</td>
<td>WC&amp;W during fence construction</td>
<td>WC&amp;W</td>
<td>WC&amp;W</td>
</tr>
<tr>
<td>Action-Specific</td>
<td>New Jersey Water Pollution Control Act Regulations (N.J.A.C 17:1A)</td>
<td>Relevant and Appropriate</td>
<td>Prohibits the discharge of any pollutant into the waters of the State without a valid permit.</td>
<td>NA</td>
<td>WC&amp;W during fence construction</td>
<td>WC&amp;W</td>
<td>WC&amp;W</td>
</tr>
<tr>
<td>Action-Specific</td>
<td>New Jersey Pollutant Discharge Elimination System Rules (N.J.A.C 7:1A)</td>
<td>Relevant and Appropriate</td>
<td>Establishes the framework under which NJDEP regulates the discharge of pollutants to the surface and groundwater’s of the State.</td>
<td>NA</td>
<td>WC&amp;W during fence construction</td>
<td>WC&amp;W</td>
<td>WC&amp;W</td>
</tr>
<tr>
<td>Action-Specific</td>
<td>New Jersey Department of Transportation (NJDOT) Standard Specifications – Soil Erosion and Sediment Control Measures (1996) (N.J.A.C. 16:25A-2.1 et seq.)</td>
<td>To Be Considered</td>
<td>NJDOT standards are typically used to develop the appropriate plans for sediment and soil erosion control required under New Jersey Soil Conservation Act.</td>
<td>NA</td>
<td>WC&amp;W during fence construction</td>
<td>WC&amp;W</td>
<td>WC&amp;W</td>
</tr>
</tbody>
</table>
### Table 6-2  
Summary of Compliance to Applicable, Relevant or Appropriate Requirements for Soil Alternatives  
Rolling Knolls Landfill Superfund Site - Feasibility Study  
Chatham, New Jersey

<table>
<thead>
<tr>
<th>Action Specific</th>
<th>Requirement</th>
<th>Status</th>
<th>Summary of Requirement</th>
<th>Soil Remedy Alternatives</th>
</tr>
</thead>
<tbody>
<tr>
<td>RCRA Generation, Transportation and Disposal of Hazardous Waste (40 CFR 260-270)</td>
<td>Potentially Applicable – to the management of waste streams for off-site disposal</td>
<td>Establishes responsibilities and standards for the management of hazardous and non-hazardous waste.</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>49 C.F.R. Hazardous Materials Transportation</td>
<td>Potentially Applicable – to waste streams transported offsite for disposal</td>
<td>Regulates transportation of hazardous materials in the United States under the Department of Transportation (49 CFR)</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>New Jersey Hazardous Waste Rules (N.J.A.C 7:26G)</td>
<td>Potentially Applicable – to waste streams transported offsite for disposal</td>
<td>Identifies the standards for the acceptable management of hazardous waste in New Jersey.</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Plant Protection Act (7 U.S.C. Section 2814)</td>
<td>Potentially Applicable if remedy requires introducing vegetation to any portion of the site</td>
<td>Requires the use of integrated management systems to control or contain undesirable plant species. Applicable to on-site remedial activities to control, eradicate, or prevent or retard the spread of such weeds.</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>NJDEP &quot;Ecological Evaluation Technical Guidance.&quot; Version 1.3, February 2015.</td>
<td>To Be Considered</td>
<td>Provides guidance on conducting ecological evaluations and implementing risk Management Decisions for ecologically sensitive natural resources.</td>
<td>NA</td>
<td>Being considered</td>
</tr>
<tr>
<td>NJDEP Site Remediation Program, Technical Guidance for the Attainment of Remediation Standards and Site-Specific Criteria September 24, 2012, Version 1.0.</td>
<td>To Be Considered</td>
<td>Guidance on alternate methods to achieve compliance with applicable remediation standards.</td>
<td>Does not comply</td>
<td>Does not comply</td>
</tr>
</tbody>
</table>

*ARAR Type: Action-Specific, Chemical-Specific, or Federal Safe Drinking Water Act*  
*Status: Potentially Applicable, To Be Considered, Either Relevant or Appropriate.*  
*Summary of Requirement: Establishes responsibilities and standards for the management of hazardous and non-hazardous waste, Regulates transportation of hazardous materials in the United States under the Department of Transportation, Identifies the standards for the acceptable management of hazardous waste in New Jersey, Requires the use of integrated management systems to control or contain undesirable plant species, Provides guidance on conducting ecological evaluations and implementing risk Management Decisions for ecologically sensitive natural resources, Guidance on alternate methods to achieve compliance with applicable remediation standards.*  
*Soil Remedy Alternatives: NA, WBCW.*
### Table 6-2
Summary of Compliance to Applicable, Relevant or Appropriate Requirements for Soil Alternatives
Rolling Knolls Landfill Superfund Site - Feasibility Study
Chatham, New Jersey

<table>
<thead>
<tr>
<th>ARAR Type</th>
<th>Requirement</th>
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<th>Summary of Requirement</th>
<th>Soil Remedy Alternatives</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chemical-Specific</td>
<td>EPA Human Health Assessment Cancer Slope Factors (CSFs)</td>
<td>To Be Considered</td>
<td>CSFs are developed by EPA for health effects assessments or evaluation by the Human Health Assessment Group. These values present the most up-to-date cancer risk potency information and are used to compute the individual incremental cancer risk resulting from exposure to carcinogens.</td>
<td>1 2 3a 3b 3c 4a 4b 5</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>NA</td>
<td>Being considered</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Being considered</td>
<td>Being considered</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Being considered</td>
<td>Being considered</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Being considered</td>
<td>Being considered</td>
</tr>
<tr>
<td>Chemical-Specific</td>
<td>NDEP &quot;NDEP Ecological Screening Criteria.&quot; March 2009. To Be Considered</td>
<td>Provides Ecological Screening Criteria to be used as screening values in ecological assessments.</td>
<td>NA</td>
<td>Being considered</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Being considered</td>
<td>Being considered</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Being considered</td>
<td>Being considered</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Being considered</td>
<td>Being considered</td>
</tr>
<tr>
<td>Chemical-Specific</td>
<td>RCRA Groundwater Protection Standards and Maximum Concentration Limits (40 CFR 264, Subpart F)</td>
<td>Applicable</td>
<td>Regulates release from the solid management unit (i.e., the landfill) and specifies the groundwater protection standards.</td>
<td>NA NA NA NA NA NA NA NA</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Being considered</td>
<td>Being considered</td>
</tr>
<tr>
<td>Chemical-Specific</td>
<td>NDEP Groundwater Quality Standards (N.J.A.C. 7:9C)</td>
<td>Applicable</td>
<td>Establishes the minimum standards for the remediation of groundwater.</td>
<td>NA NA NA NA NA NA NA NA</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Location-Specific</td>
<td>New Jersey Flood Hazard Area Control (N.J.A.C 7:13)</td>
<td>Applicable</td>
<td>Sets forth the requirements governing activities in the flood hazard area or riparian zone of a regulated water.</td>
<td>NA WBCW WBCW WBCW WBCW WBCW WBCW</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>NA</td>
<td>WBCW</td>
</tr>
<tr>
<td>Location-Specific</td>
<td>EPA's 1985 &quot;Policy on Floodplains and Wetlands Assessments for CERCLA Actions.&quot;</td>
<td>To Be Considered</td>
<td>Requires that CERCLA actions meet the substantive requirements of Floodplain Management Executive Order (EO 11988) and Protection of Wetlands Executive Order (EO 1990).</td>
<td>NA WBCW WBCW WBCW WBCW WBCW WBCW</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>NA</td>
<td>WBCW</td>
</tr>
<tr>
<td>Location-Specific</td>
<td>Executive Order 11988 Floodplain Management</td>
<td>To Be Considered</td>
<td>Requires federal agencies to avoid to the extent possible long- and short-term adverse impacts associated with the occupancy and modification of flood plains, and avoid support of floodplain-development wherever there is a practicable alternative.</td>
<td>NA WBCW WBCW WBCW WBCW WBCW WBCW</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>NA</td>
<td>WBCW</td>
</tr>
<tr>
<td>Location-Specific</td>
<td>Establishment of a Classification Exception Area/Well Restriction Area (N.J.A.C. 7:9-6.6)</td>
<td>Applicable</td>
<td>Promulgated state regulations that include requirements for establishing a classification exception area/well restriction area where groundwater quality does not meet New Jersey groundwater quality criteria</td>
<td>NA NA NA NA NA NA NA NA</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Location-Specific</td>
<td>Ground Water Quality and Surface Water Standards (N.J.A.C 7:9)</td>
<td>Applicable</td>
<td>Regulates activities respecting protection and enhancement of ground water and surface water resources.</td>
<td>NA NA NA NA NA NA NA NA</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Location-Specific</td>
<td>Federal Water Pollution Control Act (FWPCA) (33 USC 1521 et seq.)</td>
<td>Applicable</td>
<td>Requires a permit from USEPA and consideration by both the EPA and the USFWS before an application to dredge and fill may be enacted.</td>
<td>NA WBCW WBCW WBCW WBCW WBCW WBCW</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>NA</td>
<td>WBCW</td>
</tr>
</tbody>
</table>

**Geosyntec Consultants**
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## Table 6-2
Summary of Compliance to Applicable, Relevant or Appropriate Requirements for Soil Alternatives
Rolling Knolls Landfill Superfund Site - Feasibility Study
Chatham, New Jersey

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Status</th>
<th>Summary of Requirement</th>
<th>Soil Remedy Alternatives</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Location-Specific</strong></td>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Section 404 - Clean Water Act, as it pertains to wetlands</td>
<td>To Be Considered</td>
<td>Prohibits discharge of dredged or fill material into wetlands adjacent to navigable waters without a permit.</td>
<td>N/A</td>
</tr>
<tr>
<td>Executive Order 11990 Protection of Wetlands</td>
<td>To Be Considered</td>
<td>Requires federal agencies to provide leadership and take action to minimize the destruction, loss, or degradation of wetlands, and to preserve and enhance the natural and beneficial values of wetlands.</td>
<td>N/A</td>
</tr>
<tr>
<td>Endangered Species Act (16 USC 1531 et seq.)</td>
<td>Applicable</td>
<td>Requires that action be performed to conserve endangered species or threatened species.</td>
<td>N/A</td>
</tr>
<tr>
<td>New Jersey Endangered Plant Species Program (N.J.A.C 7:5C)</td>
<td>Relevant and Appropriate</td>
<td>Identifies the official list of endangered plant species and establishes the program for maintaining and updating the list.</td>
<td>N/A</td>
</tr>
<tr>
<td>New Jersey Division of Fish, Game, and Wildlife Rules (N.J.A.C 7:25)</td>
<td>Relevant and Appropriate</td>
<td>Supplements the statutes governing fish and game laws in the State of New Jersey.</td>
<td>N/A</td>
</tr>
<tr>
<td>National Wildlife Refuge System Administration Act of 1969, as amended by the National Wildlife Refuge System Improvement Act of 1997</td>
<td>Applicable</td>
<td>This act and amendments govern the use and management of National Wildlife Refuges.</td>
<td>N/A</td>
</tr>
<tr>
<td>Great Swamp/National Wildlife Refuge Conservation Plan, November 2014</td>
<td>To Be Considered</td>
<td>This plan presents the management goals, objectives, and strategies that guide the management of the Great Swamp National Wildlife Refuge over the next 15 years.</td>
<td>N/A</td>
</tr>
<tr>
<td>Wilderness Act of 1964 (16 USC 1131-1136)</td>
<td>Applicable</td>
<td>This act directs each agency administering designated wilderness to preserve the &quot;wilderness character&quot; of areas within the Nation Wilderness Preservation System (NWPS) and to administer the NWPS for the &quot;use and enjoyment of the American people in a way that will leave those areas unimpaired to future use and enjoyment as Wilderness.</td>
<td>N/A</td>
</tr>
<tr>
<td>Great Swamp/Wilderness Act of 1968 (Public Law 91-532, September 28, 1968)</td>
<td>Applicable</td>
<td>Designates the eastern portion of the refuge, comprised of 1,683 acres, as the Wilderness Area.</td>
<td>N/A</td>
</tr>
<tr>
<td>Refuge Recreation Act of 1962 (16 USC 460K-460K.4)</td>
<td>Applicable</td>
<td>Assures present or future recreational uses by the public on areas within national wildlife refuges.</td>
<td>N/A</td>
</tr>
<tr>
<td>Habitat Management and Wetlands Protection (40 CFR 6.802(a) and (b); 40 CFR A, Appendix A)</td>
<td>Applicable</td>
<td>Requires agencies to perform certain measures to avoid the long and short term impacts associated with the destruction or modification of wetlands and floodplains.</td>
<td>N/A</td>
</tr>
</tbody>
</table>
### Table 6-2

**Summary of Compliance to Applicable, Relevant or Appropriate Requirements for Soil Alternatives**

**Rolling Knolls Landfill Superfund Site - Feasibility Study**

**Chatham, New Jersey**

<table>
<thead>
<tr>
<th>ARAR Type</th>
<th>Requirement</th>
<th>Status</th>
<th>Summary of Requirement</th>
<th>1</th>
<th>2</th>
<th>3a</th>
<th>3b</th>
<th>3c</th>
<th>4a</th>
<th>4b</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Location-Specific</td>
<td>Federal Noxious Weed Act of 1974 (PL 93-629, 7 USC 2801, et seq)</td>
<td>Applicable</td>
<td>Requires the use of integrated management systems to control or contain undesirable plant species.</td>
<td>NA</td>
<td>WBCW</td>
<td>WBCW</td>
<td>WBCW</td>
<td>WBCW</td>
<td>WBCW</td>
<td>WBCW</td>
<td>WBCW</td>
</tr>
<tr>
<td>Location-Specific</td>
<td>Executive Order 13112. Management of Invasive Species</td>
<td>To Be Considered</td>
<td>Requires that federal agencies take certain actions to prevent introduction of invasive species and provide for their control.</td>
<td>NA</td>
<td>WBCW</td>
<td>WBCW</td>
<td>WBCW</td>
<td>WBCW</td>
<td>WBCW</td>
<td>WBCW</td>
<td>WBCW</td>
</tr>
<tr>
<td>Location-Specific</td>
<td>Fish and Wildlife Coordination Act (16 USC 661 et seq)</td>
<td>Applicable</td>
<td>Requires actions to protect fish or wildlife when diverting, channeling, or modifying a stream.</td>
<td>NA</td>
<td>WBCW</td>
<td>WBCW</td>
<td>WBCW</td>
<td>WBCW</td>
<td>WBCW</td>
<td>WBCW</td>
<td>WBCW</td>
</tr>
<tr>
<td>Location-Specific</td>
<td>Fish and Wildlife Coordination Act Advisories</td>
<td>To Be Considered</td>
<td>Advisories on the effects of pollutants and other activities on wildlife, including migratory birds and fish, and wildlife habitat authorized under the Fish and Wildlife Coordination Act.</td>
<td>NA</td>
<td>WBCW</td>
<td>WBCW</td>
<td>WBCW</td>
<td>WBCW</td>
<td>WBCW</td>
<td>WBCW</td>
<td>WBCW</td>
</tr>
</tbody>
</table>

**Notes**

1. **Alternative Description:**
   - Alternative 1 - No Action
   - Alternative 2 - Site Controls
   - Alternative 3a - Site Controls, Capping of Selected Area to Reduce Overall Risk, and Remediation (Consolidation Under Selected Area Cap) of Areas of Particular Concern (APCs), and Remediation of Non-Vegetated Areas with Soil Sample Results Above Remediation Goals
   - Alternative 3b - Site Controls, Capping of Selected Area to Reduce Overall Risk, and Remediation (Cap In-Place) of APCs, and Remediation of Non-Vegetated Areas with Soil Sample Results Above Remediation Goals
   - Alternative 4a - Site Controls, Excavation and Off-Site Disposal of Selected Area to Reduce Overall Risk, Remediation (Cap In-Place) of APCs, and Remediation of Non-Vegetated Areas with Soil Sample Results Above Remediation Goals
   - Alternative 4b - Site Controls, Excavation and Off-Site Disposal of Selected Area to Reduce Overall Risk, Remediation (Offsite Disposal) of APCs, and Remediation of Non-Vegetated Areas with Soil Sample Results Above Remediation Goals
   - Alternative 5 - Site Controls and Capping of All Landfill Material
   - Alternative 6 - Site Controls, Excavation and Off-Site Disposal of Developable Area and Areas of Particular Concern

2. **WBCW** - Will be complied with. Pursuant to the ARAR, applicable standards and regulations will be complied with during remedial design and actions.

3. **NA** - Not Applicable. The ARAR is not relevant to the alternative remedial actions and therefore not applicable for evaluation of compliance of the alternative to the ARAR.
## Table 6-3

### Construction Cost Estimate for Soil Alternative No. 2

Rolling Knolls Landfill Superfund Site - Feasibility Study
Chatham, New Jersey

<table>
<thead>
<tr>
<th>Component</th>
<th>Unit Cost</th>
<th>Unit</th>
<th>Quantity</th>
<th>Construction Cost Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A - Design/Construction Oversight/Permits</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre-Design Investigation</td>
<td>3% to 4%</td>
<td>% Construction$\textsuperscript{21}$</td>
<td>408,400</td>
<td>$14,300</td>
</tr>
<tr>
<td>Remedial Design</td>
<td>3% to 6%</td>
<td>% Construction$\textsuperscript{21}$</td>
<td>408,400</td>
<td>$18,400</td>
</tr>
<tr>
<td>Remedial Oversight</td>
<td>5% to 10%</td>
<td>% Construction$\textsuperscript{21}$</td>
<td>408,400</td>
<td>$30,700</td>
</tr>
<tr>
<td><strong>Subtotal</strong></td>
<td></td>
<td></td>
<td></td>
<td>$63,400</td>
</tr>
<tr>
<td><strong>B - Construction Preparation</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bonding, insurance etc.</td>
<td>0.10% to 0.20%</td>
<td>% Construction$\textsuperscript{21}$</td>
<td>408,400</td>
<td>$700</td>
</tr>
<tr>
<td>Mobilization/Demobilization</td>
<td>1% to 5%</td>
<td>% Construction$\textsuperscript{21}$</td>
<td>408,400</td>
<td>$12,300</td>
</tr>
<tr>
<td><strong>Subtotal</strong></td>
<td></td>
<td></td>
<td></td>
<td>$13,000</td>
</tr>
<tr>
<td><strong>C - General Construction and Site Management</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Site management and facilities</td>
<td>$5,000</td>
<td>$20,000</td>
<td>per mth</td>
<td>6 $75,000</td>
</tr>
<tr>
<td>Survey (topo, wetlands, etc.)</td>
<td>$2,500</td>
<td>day</td>
<td>5</td>
<td>$12,500</td>
</tr>
<tr>
<td>Britten Road entrance repairs</td>
<td>$5.5 to $6.5</td>
<td>sft</td>
<td>10,000</td>
<td>$60,000</td>
</tr>
<tr>
<td>Construction entrance</td>
<td>$5,000 to $10,000</td>
<td>est.</td>
<td>1</td>
<td>$7,500</td>
</tr>
<tr>
<td>Traffic management (assumed half of construction period)</td>
<td>$2,000 to $10,000</td>
<td>per mth</td>
<td>3</td>
<td>$18,000</td>
</tr>
<tr>
<td>Structural BMP (bog turtle)</td>
<td>$20,000 to $40,000</td>
<td>est.</td>
<td>1</td>
<td>$30,000</td>
</tr>
<tr>
<td><strong>Subtotal</strong></td>
<td></td>
<td></td>
<td></td>
<td>$203,000</td>
</tr>
<tr>
<td><strong>D - Site Controls (physical)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7-ft high perimeter fence</td>
<td>$30 per lin ft</td>
<td>6,500</td>
<td>$195,000</td>
<td></td>
</tr>
<tr>
<td>20-ft wide double access gates</td>
<td>$4,000 each</td>
<td>2</td>
<td>$8,000</td>
<td></td>
</tr>
<tr>
<td>3-ft wide man gates</td>
<td>$800 each</td>
<td>3</td>
<td>$2,400</td>
<td></td>
</tr>
<tr>
<td><strong>Subtotal</strong></td>
<td></td>
<td></td>
<td></td>
<td>$205,400</td>
</tr>
<tr>
<td><strong>E - Site Controls (administrative)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Institutional controls</td>
<td>$10,000 est.</td>
<td>1</td>
<td>$10,000</td>
<td></td>
</tr>
<tr>
<td>Reporting to EPA</td>
<td>$4,000 every 5-yrs</td>
<td>6</td>
<td>$24,000</td>
<td></td>
</tr>
<tr>
<td>Reporting to NJ</td>
<td>$4,000 every 2-yrs</td>
<td>15</td>
<td>$60,000</td>
<td></td>
</tr>
<tr>
<td><strong>Subtotal</strong></td>
<td></td>
<td></td>
<td></td>
<td>$94,000</td>
</tr>
</tbody>
</table>

Geosyntec Consultants
### Table 6-3
Construction Cost Estimate for Soil Alternative No. 2
Rolling Knolls Landfill Superfund Site - Feasibility Study
Chatham, New Jersey

<table>
<thead>
<tr>
<th>Component</th>
<th>Unit Cost</th>
<th>Unit</th>
<th>Quantity</th>
<th>Construction Cost Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>F - Post-Remedy Operation &amp; Maintenance (O&amp;M)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fence O&amp;M</td>
<td>$2,100 to $6,200</td>
<td>annual</td>
<td>30</td>
<td>$182,200</td>
</tr>
<tr>
<td>Sampling groundwater network</td>
<td>$50,000 to $100,000</td>
<td>annual</td>
<td>30</td>
<td>-</td>
</tr>
<tr>
<td><strong>Subtotal</strong></td>
<td></td>
<td></td>
<td></td>
<td><strong>$182,200</strong></td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td></td>
<td></td>
<td></td>
<td><strong>$761,000</strong></td>
</tr>
</tbody>
</table>

Notes:
1. See Table 6-4 for cost estimate assumptions, notes, and limitations.
2. Construction cost to estimate these items include the costs of Items C and D.
Table 6-4
Cost Estimate Assumptions, Notes, and Limitations for Soil
Rolling Knolls Landfill Superfund Site - Feasibility Study
Chatham, New Jersey

<table>
<thead>
<tr>
<th>Assumptions, Notes, and Limitations</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. Estimated Quantities</strong></td>
</tr>
<tr>
<td>In many cases the areas or volumes</td>
</tr>
<tr>
<td>have been assumed or obtained from</td>
</tr>
<tr>
<td>reports prepared by others. The</td>
</tr>
<tr>
<td>estimated quantities (e.g., length,</td>
</tr>
<tr>
<td>areas, or volumes) that have been</td>
</tr>
<tr>
<td>used in the development of the</td>
</tr>
<tr>
<td>cost estimates should be verified</td>
</tr>
<tr>
<td>before construction. It is assumed</td>
</tr>
<tr>
<td>that the work will be done in Level</td>
</tr>
<tr>
<td>D personnel protective equipment</td>
</tr>
<tr>
<td>(PPE) and by non-union labor.</td>
</tr>
<tr>
<td><strong>2. Unit Costs</strong></td>
</tr>
<tr>
<td>The estimated unit costs are based</td>
</tr>
<tr>
<td>on Geosyntec's experience and</td>
</tr>
<tr>
<td>published information such as</td>
</tr>
<tr>
<td>RSMeans. The costs that have been</td>
</tr>
<tr>
<td>developed should be considered</td>
</tr>
<tr>
<td>only as a relative guide. A range</td>
</tr>
<tr>
<td>of unit costs have been applied to</td>
</tr>
<tr>
<td>items with high variability.</td>
</tr>
<tr>
<td>**3. Areas of Particular Concern</td>
</tr>
<tr>
<td>(APCs)**</td>
</tr>
<tr>
<td>APCs are generally defined as</td>
</tr>
<tr>
<td>areas with soil concentrations</td>
</tr>
<tr>
<td>greater than 3 times the remedial</td>
</tr>
<tr>
<td>goal and include POI-09, POI-14,</td>
</tr>
<tr>
<td>SS-109 (i.e., TP-09), SS-90, SS-97,</td>
</tr>
<tr>
<td>SS-103, and SS-118. One acre of</td>
</tr>
<tr>
<td>soil remediation was assumed for</td>
</tr>
<tr>
<td>each APC.</td>
</tr>
<tr>
<td><strong>4. Capping</strong></td>
</tr>
<tr>
<td>A Resource Conservation and</td>
</tr>
<tr>
<td>Recovery Act (RCRA) Subtitle D</td>
</tr>
<tr>
<td>landfill capping system was</td>
</tr>
<tr>
<td>assumed for the capping system</td>
</tr>
<tr>
<td>as residential future use is not</td>
</tr>
<tr>
<td>anticipated. However, the goal of</td>
</tr>
<tr>
<td>capping in Alternatives 3, 4, and</td>
</tr>
<tr>
<td>5 is to protect human and ecological</td>
</tr>
<tr>
<td>receptors and attainment of this</td>
</tr>
<tr>
<td>goal may not require a Subtitle D-</td>
</tr>
<tr>
<td>compliant capping system; the final</td>
</tr>
<tr>
<td>cap design will be prepared during</td>
</tr>
<tr>
<td>the remedial design phase. In some</td>
</tr>
<tr>
<td>areas, the limits of cap are</td>
</tr>
<tr>
<td>expected to extend into open water.</td>
</tr>
<tr>
<td>In such areas, the cap in these</td>
</tr>
<tr>
<td>areas will need to be terminated</td>
</tr>
<tr>
<td>in water to limit contact between</td>
</tr>
<tr>
<td>waste and water. These areas are</td>
</tr>
<tr>
<td>expected to include waste relocation</td>
</tr>
<tr>
<td>edges, existing ponds adjacent to</td>
</tr>
<tr>
<td>waste, and portions of the landfill</td>
</tr>
<tr>
<td>perimeter within wetlands. It is</td>
</tr>
<tr>
<td>assumed a cap would be installed</td>
</tr>
<tr>
<td>and terminated in an anchor trench</td>
</tr>
<tr>
<td>at the toe of the excavation. The</td>
</tr>
<tr>
<td>purpose of the anchor trench is to</td>
</tr>
<tr>
<td>prevent horizontal migration of</td>
</tr>
<tr>
<td>constituents in the landfill to</td>
</tr>
<tr>
<td>the adjacent open water. Placement</td>
</tr>
<tr>
<td>of geomembrane caps may be difficult</td>
</tr>
<tr>
<td>in saturated conditions (i.e., cost</td>
</tr>
<tr>
<td>per acre would be expected to</td>
</tr>
<tr>
<td>increase). In those areas, it was</td>
</tr>
<tr>
<td>assumed that the cap would be</td>
</tr>
<tr>
<td>extended into an ‘enhanced’ anchor</td>
</tr>
<tr>
<td>trench. As part of this cost</td>
</tr>
<tr>
<td>estimate, an anchor trench has</td>
</tr>
<tr>
<td>been included around the portions</td>
</tr>
<tr>
<td>of the landfill (e.g., ponds, open</td>
</tr>
<tr>
<td>water, etc.). It was assumed that</td>
</tr>
<tr>
<td>the slope above the anchor trench</td>
</tr>
<tr>
<td>around the perimeter (fringe area)</td>
</tr>
<tr>
<td>is expected to require additional</td>
</tr>
<tr>
<td>work as part of the wetland wildlife</td>
</tr>
<tr>
<td>habitat mitigation strategy. The</td>
</tr>
<tr>
<td>transition along the cap fringe area</td>
</tr>
<tr>
<td>is expected to include a riparian</td>
</tr>
<tr>
<td>zone with a transition zone to open</td>
</tr>
<tr>
<td>water. Within this transition area,</td>
</tr>
<tr>
<td>it was assumed that the Agencies</td>
</tr>
<tr>
<td>will require additional features to</td>
</tr>
<tr>
<td>be included.</td>
</tr>
<tr>
<td><strong>5. On-Site Soil Reuse</strong></td>
</tr>
<tr>
<td>Based on cost evaluations, on-site</td>
</tr>
<tr>
<td>soil reuse is less cost effective</td>
</tr>
<tr>
<td>than imported soils because on-site</td>
</tr>
<tr>
<td>soil may require soil dewatering</td>
</tr>
<tr>
<td>and wetland impact mitigation, which</td>
</tr>
<tr>
<td>likely results in importing the</td>
</tr>
<tr>
<td>same amount of offsite soils as the</td>
</tr>
<tr>
<td>onsite soil excavated for reuse.</td>
</tr>
<tr>
<td><strong>6. Flood Hazard Area (FHA)</strong></td>
</tr>
<tr>
<td>As the Site is partially located in</td>
</tr>
<tr>
<td>a regulatory FHA, it will be</td>
</tr>
<tr>
<td>necessary to achieve a balanced</td>
</tr>
<tr>
<td>cut and fill grading plan for the</td>
</tr>
<tr>
<td>landfill closure or placing soil</td>
</tr>
<tr>
<td>for vegetation within the FHA. If a</td>
</tr>
<tr>
<td>cap is to be constructed within the</td>
</tr>
<tr>
<td>FHA, the uppermost 3 feet of</td>
</tr>
<tr>
<td>landfilled material would be</td>
</tr>
<tr>
<td>removed and relocated to the upper</td>
</tr>
<tr>
<td>area of the landfill (i.e., outside</td>
</tr>
<tr>
<td>of the FHA) before cap construction.</td>
</tr>
</tbody>
</table>

1 of 4
Table 6-4
Cost Estimate Assumptions, Notes, and Limitations for Soil
Rolling Knolls Landfill Superfund Site - Feasibility Study
Chatham, New Jersey

<table>
<thead>
<tr>
<th>Assumptions, Notes, and Limitations</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>7. Wetland Impact Mitigation</strong></td>
</tr>
<tr>
<td>Regulations, under the Freshwater Wetland Protection Act (NJAC 7:7A) provides the following guidelines for wetlands mitigation.</td>
</tr>
<tr>
<td>• Creation or Restoration.</td>
</tr>
<tr>
<td>• Enhancement: Does not include the addition of human-made habitat improvement devices such as duck boxes nor the removal of trash or debris.</td>
</tr>
<tr>
<td>Compensation ratio can range from 3:1 to 10:1 or more, depending upon the ecological benefit provided by the enhancement activities.</td>
</tr>
<tr>
<td>• Mitigation Bank or Monetary Contribution, Preservation, or Land Donation (for offsite replication): Mitigation banks are available within the State but currently not within the Site’s watershed.</td>
</tr>
<tr>
<td>To better understand the Agencies expectations regarding the wetland impact mitigation strategy, a pre-permitting consultation with New Jersey Department of Environmental Protection (NJDEP) would be necessary. A counter argument for wetland mitigation under the New Jersey Freshwater Wetlands General Permit for hazardous and landfill closures (NJAC 7:7A-5.4 and 5.5) suggests that mitigation may not be required for disturbance of wetlands located on top of the landfill, or on the intermediate or permanent cover of the landfill. Resolution of this issue will need to be discussed with the Agencies. The cost estimate only takes into consideration that when construction disturbs wetlands the restoration will be on a 1:1 basis and does not include any additional mitigation that the Agencies could apply and that when wetlands are capped, the offsite replication will be on a 1:1 basis and does not include any additional mitigation that the Agencies could apply.</td>
</tr>
<tr>
<td><strong>8. Wildlife Protection</strong></td>
</tr>
<tr>
<td>A June 2008 endangered species and critical habitat survey identified two areas of potential bog turtle habitat adjacent to the Site (Amy S. Green Environmental Consultants). Best Management Practices (BMPs) are expected to be required through coordination with the Agencies including the U.S. Fish and Wildlife New Jersey Field Office protect ‘critical’ habitat during construction. The two areas of potential bog turtle habitat include: (a) 35.31 acres along the western boundary of the landfill and (b) 10.89 acres in the northeastern portion of the landfill. Potential BMPs may include structural (e.g., reinforced silt fence, active management of turtles, etc.,) or non-structural (e.g., restrict construction during turtle nesting season). For purposes of this cost estimate, only the cost of structural BMPs has</td>
</tr>
<tr>
<td><strong>9. Well Restriction</strong></td>
</tr>
<tr>
<td>New Jersey regulation (NJAC 7:9D-2.3[a]) prohibits installation of potable wells with casings less than 50 feet in depth. It is expected that the non-potable existing well will be decommissioned.</td>
</tr>
<tr>
<td><strong>10. Groundwater Monitoring Network</strong></td>
</tr>
<tr>
<td>No costs have been included to address groundwater. These are addressed under the groundwater alternatives. If Groundwater Alternative 1 (No Action) is selected as the remedy for groundwater, some additional costs will be incurred for long-term monitoring related to the landfill, independent of groundwater</td>
</tr>
<tr>
<td>Assumptions, Notes, and Limitations</td>
</tr>
<tr>
<td>-------------------------------------</td>
</tr>
<tr>
<td>11. <strong>Contingency Cost</strong></td>
</tr>
<tr>
<td>The cost estimates do not include</td>
</tr>
<tr>
<td>contingency costs (e.g., handling</td>
</tr>
<tr>
<td>of unforeseen liquid or hazardous</td>
</tr>
<tr>
<td>wastes found in drums or other</td>
</tr>
<tr>
<td>containers). It is assumed that</td>
</tr>
<tr>
<td>existing structures to be</td>
</tr>
<tr>
<td>demolished have no hazardous</td>
</tr>
<tr>
<td>materials and can be disposed of</td>
</tr>
<tr>
<td>(consolidated) on-site.</td>
</tr>
<tr>
<td>12. **New Jersey Licensed Site</td>
</tr>
<tr>
<td>Remediation Professional (LSRP)</td>
</tr>
<tr>
<td>The opinion of an LSRP may be</td>
</tr>
<tr>
<td>required during construction; these</td>
</tr>
<tr>
<td>costs have not been included.</td>
</tr>
<tr>
<td>13. <strong>Britten Road</strong></td>
</tr>
<tr>
<td>Only an asphalt overlay will be</td>
</tr>
<tr>
<td>required to restore Britten Road</td>
</tr>
<tr>
<td>after construction as needed.</td>
</tr>
<tr>
<td>14. <strong>Construction Access Road</strong></td>
</tr>
<tr>
<td>It was assumed a temporary access</td>
</tr>
<tr>
<td>road with a length equivalent to</td>
</tr>
<tr>
<td>half the perimeter of the Site will</td>
</tr>
<tr>
<td>be constructed.</td>
</tr>
<tr>
<td>15. <strong>Clearing and Grubbing</strong></td>
</tr>
<tr>
<td>The clearing and grubbing unit</td>
</tr>
<tr>
<td>cost is expected to vary</td>
</tr>
<tr>
<td>according to the type of existing</td>
</tr>
<tr>
<td>vegetation (forested or vegetated).</td>
</tr>
<tr>
<td>16. <strong>Upland Area Disturbance</strong></td>
</tr>
<tr>
<td>The cost estimates do not include</td>
</tr>
<tr>
<td>the cost for mitigation of the</td>
</tr>
<tr>
<td>disturbed upland areas (e.g.,</td>
</tr>
<tr>
<td>mature forest).</td>
</tr>
<tr>
<td>17. <strong>Passive Gas Vent System</strong></td>
</tr>
<tr>
<td>A passive gas vent system will</td>
</tr>
<tr>
<td>consist of vertical above ground</td>
</tr>
<tr>
<td>vents tied into a gas vent layer</td>
</tr>
<tr>
<td>or a horizontal pipe in a gravel</td>
</tr>
<tr>
<td>trench constructed under the cap.</td>
</tr>
<tr>
<td>18. <strong>Function and Value Assessment</strong></td>
</tr>
<tr>
<td>It is assumed sufficient information</td>
</tr>
<tr>
<td>has been collected to satisfy a</td>
</tr>
<tr>
<td>function and value assessment for</td>
</tr>
<tr>
<td>the existing ponds and the 8.3 acres</td>
</tr>
<tr>
<td>of ponds on or adjacent to the</td>
</tr>
<tr>
<td>landfill will not require any major</td>
</tr>
<tr>
<td>retrofits for the management of</td>
</tr>
<tr>
<td>stormwater from the cap. Where</td>
</tr>
<tr>
<td>waste exists along a pond</td>
</tr>
<tr>
<td>perimeter, a cap extension will be</td>
</tr>
<tr>
<td>installed. No dewatering costs have</td>
</tr>
<tr>
<td>been included.</td>
</tr>
<tr>
<td>Assumptions, Notes, and Limitations</td>
</tr>
<tr>
<td>------------------------------------</td>
</tr>
<tr>
<td><strong>19. Access Control Fence</strong></td>
</tr>
<tr>
<td>It is assumed that an access control perimeter fence will be installed only on the sides of the landfill adjacent to private property (i.e., no fence will be installed on the boundary with Great Swamp National Wildlife Refuge).</td>
</tr>
<tr>
<td><strong>20. Excavation of Impacted Soils</strong></td>
</tr>
<tr>
<td>As historic data indicate impact to soils in APCs is limited to a depth less than 2 ft below ground surface, it is assumed the top 2-ft of soils of APCs and/or the top 2 to 4-ft of 25-acre selected area (Functional Area 1) will be excavated for consolidation under a cap or offsite disposal, depending on selected alternatives. For offsite disposal, it was assumed 50% of excavated soil is non-hazardous waste and the remaining 50% is hazardous waste. It was also assumed the hazardous and non-hazardous waste disposal facilities are available within 30 miles from the site.</td>
</tr>
<tr>
<td><strong>21. Vegetation of Mostly Non-Vegetated Areas</strong></td>
</tr>
<tr>
<td>It is assumed that 50% of the non-vegetated areas can be vegetated by scarifying, fertilizing, and seeding, and the remaining 50% of the non-vegetated areas will require placement of 2-ft thick vegetative support soils (e.g., loam) and seeding. It is also assumed that all non-vegetated areas are located outside of the FHA and therefore flood storage loss compensation for the placement of 2-ft thick soil is not considered.</td>
</tr>
<tr>
<td><strong>22. Post-Remedy Operation and Maintenance</strong></td>
</tr>
<tr>
<td>30 years of operations and maintenance for capped areas and fence and 5 years of maintenance for wetland mitigation areas were assumed. An annual inflation rate of 2.5% was assumed. It was assumed that approximately 1 to 3% of the initial construction costs of the perimeter fence and vegetation of non-vegetated areas will be needed for annual maintenance.</td>
</tr>
<tr>
<td><strong>23. Construction Duration</strong></td>
</tr>
<tr>
<td>The assumed construction durations are based on Geosyntec's experience of project with similar scopes. Depending on contractor and their work plan/strategy/experience, weather conditions, and/or unforeseen site conditions (e.g., high value wildlife), a construction duration (and thus overall construction cost) may vary significantly.</td>
</tr>
</tbody>
</table>
### Table 6-5
**Construction Cost Estimate for Landfill Closure Cap Unit Costs**
*Rolling Knolls Landfill Superfund Site - Feasibility Study*
*Chatham, New Jersey*

#### Potential Cap Components

<table>
<thead>
<tr>
<th>Component</th>
<th>cyd/acre</th>
<th>$/acre</th>
</tr>
</thead>
<tbody>
<tr>
<td>seed &amp; mulch</td>
<td>-</td>
<td>3,270</td>
</tr>
<tr>
<td>6-in topsoil layer</td>
<td>810</td>
<td>30,780</td>
</tr>
<tr>
<td>18-in protective layer</td>
<td>2,420</td>
<td>84,700</td>
</tr>
<tr>
<td>geonet composite</td>
<td>-</td>
<td>32,670</td>
</tr>
<tr>
<td>60-mil HDPE geomembrane</td>
<td>-</td>
<td>23,960</td>
</tr>
<tr>
<td>6-in gas venting layer</td>
<td>810</td>
<td>28,350</td>
</tr>
<tr>
<td>6-in grading and shaping layer</td>
<td>810</td>
<td>4,660</td>
</tr>
<tr>
<td>NJ analytical soil tests</td>
<td>4,850</td>
<td>5,000</td>
</tr>
</tbody>
</table>

**Total Cost per Acre:** $213,390

**Notes:**

1. Certain soils such as granular gas vent layer are expected to meet rigorous specification and therefore assume these soils would need to be obtained from an off-site source. Assume that soils will require NJDEP clean fill analytical testing at a reduced frequency of one sample per 1,000 cyd at $1,000/sample with standard turnaround time. The analytical results may need to be reviewed and approved by NJ Licensed Site Remediation Professional; these costs have not been included.

2. Several cap components could be subject to an equivalency evaluation (and possible additional cost reduction), including
   - modify 60-mil to 40-mil thick geomembrane assuming the use of 3/4-in dia. minus material (would need to be confirmed by a puncture test).
   - use of single-sided geonet composite in lieu of double-sided composite (would need to be confirmed by interface friction test).
   - assume the gas venting layer, based on limited methane production, could be substitute for a 6-in thick G&S foundation layer.

3. Costs of the geosynthetic components are based on the 2017 costs for a 25+ acre site closure, provided by Agru America.

4. Estimated number of truck per acre assumes the delivery truck with two trailer axles has a maximum weight capacity of 44,000 lbs per load and assumes ideal unit weights for each material.
## Table 6-6a

**Construction Cost Estimate for Soil Alternative No. 3a**  
Rolling Knolls Landfill Superfund Site - Feasibility Study  
Chatham, New Jersey

<table>
<thead>
<tr>
<th>Component</th>
<th>Range Unit Cost</th>
<th>Unit</th>
<th>Quantity</th>
<th>Construction Cost Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A - Design/Construction Oversight/Permits</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre-Design Investigation</td>
<td>3% to 4%</td>
<td>% Construction(^{(2)})</td>
<td>$11,429,900</td>
<td>$400,100</td>
</tr>
<tr>
<td>Remedial Design</td>
<td>3% to 6%</td>
<td>% Construction(^{(2)})</td>
<td>$11,429,900</td>
<td>$514,400</td>
</tr>
<tr>
<td>Remedial Oversight</td>
<td>5% to 10%</td>
<td>% Construction(^{(2)})</td>
<td>$11,429,900</td>
<td>$857,300</td>
</tr>
<tr>
<td><strong>Subtotal</strong></td>
<td></td>
<td></td>
<td>$1,771,800</td>
<td></td>
</tr>
<tr>
<td><strong>B - Construction Preparation</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bonding, insurance etc.</td>
<td>0.10% to 0.15%</td>
<td>% Construction(^{(2)})</td>
<td>$11,429,900</td>
<td>$14,300</td>
</tr>
<tr>
<td>Mobilization/Demobilization</td>
<td>1% to 2%</td>
<td>% Construction(^{(2)})</td>
<td>$11,429,900</td>
<td>$171,500</td>
</tr>
<tr>
<td><strong>Subtotal</strong></td>
<td></td>
<td></td>
<td>$185,800</td>
<td></td>
</tr>
<tr>
<td><strong>C - General Construction and Site Management</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Site management and facilities</td>
<td>$5,000 to $20,000</td>
<td>per mth</td>
<td>18</td>
<td>$225,000</td>
</tr>
<tr>
<td>Survey (topo, wetlands, etc.)</td>
<td>$75,000 to $100,000</td>
<td>est.</td>
<td>1</td>
<td>$87,500</td>
</tr>
<tr>
<td>Britten Road entrance overlay</td>
<td>$5.5 to $6.5</td>
<td>sft</td>
<td>35,000</td>
<td>$210,000</td>
</tr>
<tr>
<td>Construction entrance</td>
<td>$5,000 to $10,000</td>
<td>est.</td>
<td>1</td>
<td>$7,500</td>
</tr>
<tr>
<td>Traffic management</td>
<td>$2,000 to $10,000</td>
<td>mth</td>
<td>10</td>
<td>$60,000</td>
</tr>
<tr>
<td>Demolition existing structures and place in LF</td>
<td>$10,000 to $25,000</td>
<td>est.</td>
<td>1</td>
<td>$17,500</td>
</tr>
<tr>
<td>25-ft wide construction access road</td>
<td>$100 to $200</td>
<td>lin ft</td>
<td>5,600</td>
<td>$840,000</td>
</tr>
<tr>
<td>15-ft wide permanent access road</td>
<td>$60 to $120</td>
<td>lin ft</td>
<td>5,600</td>
<td>$504,000</td>
</tr>
<tr>
<td>Structural BMP (bog turtle)</td>
<td>$20,000 to $40,000</td>
<td>est.</td>
<td>1</td>
<td>$30,000</td>
</tr>
<tr>
<td><strong>Subtotal</strong></td>
<td></td>
<td></td>
<td>$1,981,500</td>
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</table>
### Table 6-6a
Construction Cost Estimate for Soil Alternative No. 3a
Rolling Knolls Landfill Superfund Site - Feasibility Study
Chatham, New Jersey

**D - Areas of Particular Concern (APCs)**
APCs include POI-09, POI-14, SS-109 (i.e., TP-09), SS-90, SS-97, SS-103, and SS-118.
Assumed 1-acre remediation for each APC.

<table>
<thead>
<tr>
<th>Component</th>
<th>Range</th>
<th>Unit Cost</th>
<th>Unit</th>
<th>Quantity</th>
<th>Construction Cost Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Remediation area:</strong></td>
<td>7.0</td>
<td>acres</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Flood hazard area (FHA):</strong></td>
<td>4.0</td>
<td>acres</td>
<td>including APCs POI-9, POI-14, SS-109, and SS-118</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Surface Debris Area:</strong></td>
<td>2.0</td>
<td>acres</td>
<td>including APCs POI-9 and POI-14</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Wetland impact area:</strong></td>
<td>4.8</td>
<td>acres</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Remediation area perimeter:</strong></td>
<td>5,200</td>
<td>feet</td>
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<td></td>
</tr>
</tbody>
</table>

**Site Preparation**

<table>
<thead>
<tr>
<th>Activity</th>
<th>Unit Cost</th>
<th>Unit</th>
<th>Quantity</th>
<th>Construction Cost Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Silt fence (perimeter of each APC)</td>
<td>$5</td>
<td>lin ft</td>
<td>6,240</td>
<td>$31,200</td>
</tr>
<tr>
<td>Turbidity curtain</td>
<td>$10</td>
<td>lin ft</td>
<td>5,200</td>
<td>$52,000</td>
</tr>
<tr>
<td>Clearing/grubbing</td>
<td>$2,000</td>
<td>acre</td>
<td>8.4</td>
<td>$16,800</td>
</tr>
<tr>
<td>Relocation of surface debris using LGP equipment</td>
<td>$10</td>
<td>cyd</td>
<td>3,300</td>
<td>$33,000</td>
</tr>
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</table>

**Consolidate Impacted Soil Under Selected 25-Acre Cap Area**

<table>
<thead>
<tr>
<th>Activity</th>
<th>Unit Cost</th>
<th>Unit</th>
<th>Quantity</th>
<th>Construction Cost Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Remove/relocate 2-ft thick impacted soil</td>
<td>$20</td>
<td>cyd</td>
<td>22,600</td>
<td>$452,000</td>
</tr>
<tr>
<td>Backfill with offsite soil (e.g., loam)</td>
<td>$40</td>
<td>cyd</td>
<td>22,600</td>
<td>$904,000</td>
</tr>
<tr>
<td>Wetland restoration (re-vegetation)</td>
<td>$3,000</td>
<td>acre</td>
<td>4.8</td>
<td>$14,400</td>
</tr>
</tbody>
</table>

| **Subtotal** | | | | $1,503,400 |

**E - 25-Acre Selected Area (Functional Area 1)**

<table>
<thead>
<tr>
<th>Activity</th>
<th>Unit Cost</th>
<th>Unit</th>
<th>Quantity</th>
<th>Construction Cost Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Remediation area:</td>
<td>25</td>
<td>acres</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flood hazard area (FHA):</td>
<td>0</td>
<td>acres</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wetland impact area:</td>
<td>3</td>
<td>acres</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Remediation area perimeter:</td>
<td>6,100</td>
<td>feet</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Site Preparation**

<table>
<thead>
<tr>
<th>Activity</th>
<th>Unit Cost</th>
<th>Unit</th>
<th>Quantity</th>
<th>Construction Cost Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Silt fence</td>
<td>$5</td>
<td>lin ft</td>
<td>7,320</td>
<td>$36,600</td>
</tr>
<tr>
<td>Turbidity curtain</td>
<td>$10</td>
<td>lin ft</td>
<td>1,525</td>
<td>$15,800</td>
</tr>
<tr>
<td>Clearing/grubbing</td>
<td>$2,000</td>
<td>acre</td>
<td>30</td>
<td>$60,000</td>
</tr>
<tr>
<td>Regrade ground to design grades (including 3-ft soil/waste relocation in FHA)</td>
<td>$10</td>
<td>cyd</td>
<td>121,000</td>
<td>$1,210,000</td>
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</table>

**Final Closure Cap**

<table>
<thead>
<tr>
<th>Activity</th>
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<th>Unit</th>
<th>Quantity</th>
<th>Construction Cost Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subtitle D cap</td>
<td>$220,000</td>
<td>acre</td>
<td>25</td>
<td>$5,500,000</td>
</tr>
<tr>
<td>Stormwater basin</td>
<td>$20,000</td>
<td>to</td>
<td>$40,000</td>
<td>est.</td>
</tr>
<tr>
<td>Perimeter anchor trench</td>
<td>$2</td>
<td>lin ft</td>
<td>4,270</td>
<td>$8,600</td>
</tr>
<tr>
<td>Landform plus enhanced AT</td>
<td>$65</td>
<td>lin ft</td>
<td>1,830</td>
<td>$119,000</td>
</tr>
<tr>
<td>Passive LFG control (vents or vents &amp; trenches)</td>
<td>$4,000</td>
<td>to</td>
<td>$6,000</td>
<td>acre</td>
</tr>
<tr>
<td>Wetland 1:1 on-Site reconstruction</td>
<td>$150,000</td>
<td>acre</td>
<td>3.0</td>
<td>$450,000</td>
</tr>
<tr>
<td>Wetland restoration (re-vegetation)</td>
<td>$3,000</td>
<td>acre</td>
<td>1</td>
<td>$3,000</td>
</tr>
</tbody>
</table>

| **Subtotal** | | | | $7,617,500 |
## Table 6-6a
### Construction Cost Estimate for Soil Alternative No. 3a
#### Rolling Knolls Landfill Superfund Site - Feasibility Study
Chatham, New Jersey

<table>
<thead>
<tr>
<th>Component</th>
<th>Range Unit Cost</th>
<th>Unit</th>
<th>Quantity</th>
<th>Construction Cost Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>F - Vegetation of Non-Vegetated Areas</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Outside of FHA</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Scarify, fertilize, and hydroseed</td>
<td>$3,300</td>
<td>acre</td>
<td>1</td>
<td>$3,300</td>
</tr>
<tr>
<td>2-ft soil (veg. support + topsoil) and hydroseed</td>
<td>$118,750</td>
<td>acre</td>
<td>1</td>
<td>$118,800</td>
</tr>
<tr>
<td><strong>Subtotal</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>G - Site Controls (physical)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7-ft high perimeter fence</td>
<td>$30</td>
<td>lin ft</td>
<td>6,500</td>
<td>$195,000</td>
</tr>
<tr>
<td>20-ft wide double access gates</td>
<td>$4,000</td>
<td>each</td>
<td>2</td>
<td>8,000</td>
</tr>
<tr>
<td>3-ft wide man gates</td>
<td>$800</td>
<td>each</td>
<td>3</td>
<td>2,400</td>
</tr>
<tr>
<td><strong>Subtotal</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>H - Site Controls (administrative)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Institutional controls</td>
<td>$10,000</td>
<td>est.</td>
<td>1</td>
<td>$10,000</td>
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<tr>
<td>Reporting to EPA</td>
<td>$4,000</td>
<td>every 5-yrs</td>
<td>6</td>
<td>$24,000</td>
</tr>
<tr>
<td>Reporting to NJ</td>
<td>$4,000</td>
<td>every 2-yrs</td>
<td>15</td>
<td>$60,000</td>
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<tr>
<td><strong>Subtotal</strong></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>I - Post-Remedy Operation &amp; Maintenance</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maintenance of Vegetation Areas (Item F)</td>
<td>$1,300 to $3,700</td>
<td>annual</td>
<td>30</td>
<td>$109,800</td>
</tr>
<tr>
<td>Landfill monitoring/maintenance</td>
<td>$20,000 to $50,000</td>
<td>annual</td>
<td>30</td>
<td>$1,536,600</td>
</tr>
<tr>
<td>Fence O&amp;M</td>
<td>$2,100 to $6,200</td>
<td>annual</td>
<td>30</td>
<td>$182,200</td>
</tr>
<tr>
<td>Wetland mitigation monitoring/maintenance</td>
<td>$37,500 to $50,000</td>
<td>annual</td>
<td>5</td>
<td>$230,000</td>
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<tr>
<td><strong>Subtotal</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Notes:**

1. See Table 6-4 for cost estimate assumptions, notes, and limitations.
2. Construction cost to estimate these items include the costs of Items C through G.
# Table 6-6b

## Construction Cost Estimate for Soil Alternative No. 3b

**Rolling Knolls Landfill Superfund Site - Feasibility Study**  
**Chatham, New Jersey**

<table>
<thead>
<tr>
<th>Component</th>
<th>Range Unit Cost</th>
<th>Unit</th>
<th>Quantity</th>
<th>Construction Cost Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A - Design/Construction Oversight/Permits</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre-Design Investigation</td>
<td>3% to 4%</td>
<td>% Construction&lt;sup&gt;(2)&lt;/sup&gt;</td>
<td>$13,009,100</td>
<td>$455,400</td>
</tr>
<tr>
<td>Remedial Design</td>
<td>3% to 6%</td>
<td>% Construction&lt;sup&gt;(2)&lt;/sup&gt;</td>
<td>$13,009,100</td>
<td>$585,500</td>
</tr>
<tr>
<td>Remedial Oversight</td>
<td>5% to 10%</td>
<td>% Construction&lt;sup&gt;(2)&lt;/sup&gt;</td>
<td>$13,009,100</td>
<td>$975,700</td>
</tr>
<tr>
<td><strong>Subtotal</strong></td>
<td></td>
<td></td>
<td></td>
<td>$2,016,600</td>
</tr>
<tr>
<td><strong>B - Construction Preparation</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bonding, insurance etc.</td>
<td>0.10% to 0.15%</td>
<td>% Construction&lt;sup&gt;(2)&lt;/sup&gt;</td>
<td>$13,009,100</td>
<td>$16,300</td>
</tr>
<tr>
<td>Mobilization/Demobilization</td>
<td>1% to 2%</td>
<td>% Construction&lt;sup&gt;(2)&lt;/sup&gt;</td>
<td>$13,009,100</td>
<td>$195,200</td>
</tr>
<tr>
<td><strong>Subtotal</strong></td>
<td></td>
<td></td>
<td></td>
<td>$211,500</td>
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<tr>
<td><strong>C - General Construction and Site Management</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Site management and facilities</td>
<td>$5,000 to $20,000</td>
<td>per mth</td>
<td>18</td>
<td>$225,000</td>
</tr>
<tr>
<td>Survey (topo, wetlands, etc.)</td>
<td>$75,000 to $100,000</td>
<td>est.</td>
<td>1</td>
<td>$87,500</td>
</tr>
<tr>
<td>Britten Road entrance overlay</td>
<td>$5.5 to $6.5</td>
<td>sft</td>
<td>$35,000</td>
<td>$210,000</td>
</tr>
<tr>
<td>Construction entrance</td>
<td>$5,000 to $10,000</td>
<td>est.</td>
<td>1</td>
<td>$7,500</td>
</tr>
<tr>
<td>Traffic management</td>
<td>$2,000 to $10,000</td>
<td>mth</td>
<td>10</td>
<td>$60,000</td>
</tr>
<tr>
<td>Demolition existing structures and place in LF</td>
<td>$10,000 to $25,000</td>
<td>est.</td>
<td>1</td>
<td>$17,500</td>
</tr>
<tr>
<td>25-ft wide construction access road</td>
<td>$100 to $200</td>
<td>lin ft</td>
<td>$5,600</td>
<td>$840,000</td>
</tr>
<tr>
<td>15-ft wide permanent access road</td>
<td>$60 to $120</td>
<td>lin ft</td>
<td>$5,600</td>
<td>$504,000</td>
</tr>
<tr>
<td>Structural BMP (bog turtle)</td>
<td>$20,000 to $40,000</td>
<td>est.</td>
<td>1</td>
<td>$30,000</td>
</tr>
<tr>
<td><strong>Subtotal</strong></td>
<td></td>
<td></td>
<td></td>
<td>$1,381,500</td>
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</table>
### Table 6-6b
**Construction Cost Estimate for Soil Alternative No. 3b**

**Rolling Knolls Landfill Superfund Site - Feasibility Study**  
**Chatham, New Jersey**

<table>
<thead>
<tr>
<th>Component</th>
<th>Range Unit Cost</th>
<th>Unit</th>
<th>Quantity</th>
<th>Construction Cost Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>D - Areas of Particular Concern (APCs)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>APC includes POI-09, POI-14, SS-109 (i.e., TP-09), SS-90, SS-97, SS-103, and SS-118.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Assumed 1-acre remediation for each APC.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Remediation area:</td>
<td>7.0</td>
<td>acres</td>
<td></td>
<td>31,200</td>
</tr>
<tr>
<td>Flood hazard area (FHA):</td>
<td>4.0</td>
<td>acres</td>
<td>including APCs POI-9, POI-14, SS-109, and SS-118</td>
<td>52,000</td>
</tr>
<tr>
<td>Surface Debris Area:</td>
<td>2.0</td>
<td>acres</td>
<td>including APCs POI-9 and POI-14</td>
<td>16,800</td>
</tr>
<tr>
<td>Wetland impact area:</td>
<td>4.8</td>
<td>acres</td>
<td></td>
<td>33,000</td>
</tr>
<tr>
<td>Remediation area perimeter:</td>
<td>5,200</td>
<td>feet</td>
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<td></td>
</tr>
<tr>
<td><strong>Site Preparation</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Silt fence (perimeter of each APC)</td>
<td>$5</td>
<td>lin ft</td>
<td>6,240</td>
<td>31,200</td>
</tr>
<tr>
<td>Turbidity curtain</td>
<td>$10</td>
<td>lin ft</td>
<td>5,200</td>
<td>52,000</td>
</tr>
<tr>
<td>Clearing/grubbing</td>
<td>$2,000</td>
<td>acre</td>
<td>8.4</td>
<td>16,800</td>
</tr>
<tr>
<td>Relocation of surface debris using LGP equipment</td>
<td>$3,300</td>
<td>cyd</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Cap In-Place</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Excavate/relocate 3-ft soil in FHA</td>
<td></td>
<td>20</td>
<td>cyd</td>
<td>19,400</td>
</tr>
<tr>
<td>Subtitle D cap (see Table 6-4 for details)</td>
<td>$220,000</td>
<td>acre</td>
<td>7</td>
<td>1,540,000</td>
</tr>
<tr>
<td>Stormwater basin (one basin per each APC)</td>
<td>$20,000</td>
<td>to</td>
<td>$40,000</td>
<td>$20,000</td>
</tr>
<tr>
<td>Perimeter anchor trench</td>
<td>$2</td>
<td>lin ft</td>
<td>2,600</td>
<td>5,200</td>
</tr>
<tr>
<td>Landform plus enhanced AT</td>
<td>$65</td>
<td>lin ft</td>
<td>2,600</td>
<td>169,000</td>
</tr>
<tr>
<td>Passive LFG control (vents or vents &amp; trenches)</td>
<td>$4,000</td>
<td>to</td>
<td>$6,000</td>
<td>$60,000</td>
</tr>
<tr>
<td>Wetland 1:1 on-Site reconstruction</td>
<td>$150,000</td>
<td>acre</td>
<td>4.0</td>
<td>600,000</td>
</tr>
<tr>
<td>Wetland restoration (re-vegetation)</td>
<td>$3,000</td>
<td>acre</td>
<td>0.8</td>
<td>2,400</td>
</tr>
<tr>
<td><strong>Subtotal</strong></td>
<td></td>
<td></td>
<td></td>
<td>$3,082,600</td>
</tr>
<tr>
<td><strong>E - 25-Acre Selected Area (Functional Area 1)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Remediation area:</td>
<td>25</td>
<td>acres</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flood hazard area (FHA):</td>
<td>0</td>
<td>acres</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wetland impact area:</td>
<td>3</td>
<td>acres</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Remediation area perimeter:</td>
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<tr>
<td>Silt fence</td>
<td>$5</td>
<td>lin ft</td>
<td>7,320</td>
<td>36,600</td>
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<tr>
<td>Turbidity curtain</td>
<td>$10</td>
<td>lin ft</td>
<td>1,525</td>
<td>15,300</td>
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<tr>
<td>Clearing/grubbing</td>
<td>$2,000</td>
<td>acre</td>
<td>30</td>
<td>60,000</td>
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<tr>
<td>Regrade ground to design grades (including 3-ft soil/waste relocation in FHA)</td>
<td>$10</td>
<td>cyd</td>
<td>121,000</td>
<td>1,210,000</td>
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<tr>
<td><strong>Final Closure Cap</strong></td>
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<tr>
<td>Subtitle D cap</td>
<td>$220,000</td>
<td>acre</td>
<td>25</td>
<td>5,500,000</td>
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<tr>
<td>Stormwater basin</td>
<td>$20,000</td>
<td>to</td>
<td>$40,000</td>
<td>$20,000</td>
</tr>
<tr>
<td>Perimeter anchor trench</td>
<td>$2</td>
<td>lin ft</td>
<td>4,270</td>
<td>8,600</td>
</tr>
<tr>
<td>Landform plus enhanced AT</td>
<td>$65</td>
<td>lin ft</td>
<td>1,830</td>
<td>119,000</td>
</tr>
<tr>
<td>Passive LFG control (vents or vents &amp; trenches)</td>
<td>$4,000</td>
<td>to</td>
<td>$6,000</td>
<td>$4,000</td>
</tr>
<tr>
<td>Wetland 1:1 on-Site reconstruction</td>
<td>$150,000</td>
<td>acre</td>
<td>3.0</td>
<td>450,000</td>
</tr>
<tr>
<td>Wetland restoration (re-vegetation)</td>
<td>$3,000</td>
<td>acre</td>
<td>1</td>
<td>3,000</td>
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<td><strong>Subtotal</strong></td>
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Table 6-6b
Construction Cost Estimate for Soil Alternative No. 3b
Rolling Knolls Landfill Superfund Site - Feasibility Study
Chatham, New Jersey

<table>
<thead>
<tr>
<th>Component</th>
<th>Range Unit Cost</th>
<th>Unit</th>
<th>Quantity</th>
<th>Construction Cost Estimate</th>
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<tr>
<td>F - Vegetation of Non-Vegetated Areas</td>
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<tr>
<td>Outside of FHA</td>
<td>$3,300</td>
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<td>$3,300</td>
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<td>Scarify, fertilize, and hydrosedeed</td>
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<td>2 acres</td>
<td>$118,750</td>
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<td>2-ft soil (veg. support + topsoil)</td>
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<tr>
<td>and hydrosedeed</td>
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<td>Subtotal</td>
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<tr>
<td>G - Site Controls (physical)</td>
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<tr>
<td>7-ft high perimeter fence</td>
<td>$30</td>
<td>lin ft</td>
<td>6,500</td>
<td>$195,000</td>
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<tr>
<td>20-ft wide double access gates</td>
<td>$4,000</td>
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<td>2</td>
<td>$8,000</td>
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<td>3-ft wide man gates</td>
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<td>H - Site Controls (administrative)</td>
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<td>Institutional controls</td>
<td>$10,000</td>
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<td>Reporting to EPA</td>
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<td>every 5-yrs</td>
<td>6</td>
<td>$24,000</td>
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<td>Reporting to NJ</td>
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<td>Subtotal</td>
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<td>I - Post-Remedy Operation &amp; Maintenance</td>
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<tr>
<td>Maintenance of Vegetation Areas (Item F)</td>
<td>$1,300 to $3,700</td>
<td>annual</td>
<td>30</td>
<td>$109,800</td>
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<tr>
<td>Landfill monitoring/maintenance</td>
<td>$20,000</td>
<td>to $50,000</td>
<td>annual</td>
<td>30</td>
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<tr>
<td>Fence O&amp;M</td>
<td>$2,100</td>
<td>to $6,200</td>
<td>annual</td>
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<td>Wetland mitigation monitoring/maintenance</td>
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<td>Total</td>
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Notes:
(1) See Table 6-4 for cost estimate assumptions, notes, and limitations.
(2) Construction cost to estimate these items include the costs of Items C through G.
Table 6-6c
Construction Cost Estimate for Soil Alternative No. 3c
Rolling Knolls Landfill Superfund Site - Feasibility Study
Chatham, New Jersey

<table>
<thead>
<tr>
<th>Component</th>
<th>Range Unit Cost</th>
<th>Unit</th>
<th>Quantity</th>
<th>Construction Cost Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A - Design/Construction Oversight/Permits</strong></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Pre-Design Investigation</td>
<td>3% to 4%</td>
<td>% Construction (2)</td>
<td>16,175,900</td>
<td>566,200</td>
</tr>
<tr>
<td>Remedial Design</td>
<td>3% to 6%</td>
<td>% Construction (2)</td>
<td>16,175,900</td>
<td>728,000</td>
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<tr>
<td>Remedial Oversight</td>
<td>5% to 10%</td>
<td>% Construction (2)</td>
<td>16,175,900</td>
<td>1,213,200</td>
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<td><strong>Subtotal</strong></td>
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<td></td>
<td></td>
<td>$2,507,400</td>
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<tr>
<td><strong>B - Construction Preparation</strong></td>
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<tr>
<td>Bonding, insurance etc.</td>
<td>0.10% to 0.15%</td>
<td>% Construction (2)</td>
<td>16,175,900</td>
<td>20,300</td>
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<tr>
<td>Mobilization/Demobilization</td>
<td>1% to 2%</td>
<td>% Construction (2)</td>
<td>16,175,900</td>
<td>242,700</td>
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<td><strong>Subtotal</strong></td>
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<td>$263,000</td>
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<td><strong>C - General Construction and Site Management</strong></td>
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<tr>
<td>Site management and facilities</td>
<td>$5,000 to $20,000</td>
<td>per mth</td>
<td>18</td>
<td>$225,000</td>
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<tr>
<td>Survey (topo, wetlands, etc.)</td>
<td>$75,000 to $100,000</td>
<td>est.</td>
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<td>Britten Road entrance overlay</td>
<td>$5.5 to $6.5</td>
<td>sq ft</td>
<td>35,000</td>
<td>$210,000</td>
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<tr>
<td>Construction entrance</td>
<td>$5,000 to $10,000</td>
<td>est.</td>
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<td>$7,500</td>
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<tr>
<td>Traffic management</td>
<td>$2,000 to $10,000</td>
<td>mth</td>
<td>10</td>
<td>$60,000</td>
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<tr>
<td>Demolition existing structures and place in LF</td>
<td>$10,000 to $25,000</td>
<td>est.</td>
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<td>$17,500</td>
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<td>25-ft wide construction access road</td>
<td>$100 to $200</td>
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<td>5,600</td>
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<td>15-ft wide permanent access road</td>
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<td>lin ft</td>
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<td>Structural BMP (bog turtle)</td>
<td>$20,000 to $40,000</td>
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<td><strong>Subtotal</strong></td>
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### Table 6-6c
Construction Cost Estimate for Soil Alternative No. 3c
Rolling Knolls Landfill Superfund Site - Feasibility Study
Chatham, New Jersey

Geosyntec Consultants

<table>
<thead>
<tr>
<th>Component</th>
<th>Range Unit Cost</th>
<th>Unit</th>
<th>Quantity</th>
<th>Construction Cost Estimate</th>
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<tr>
<td><strong>D - Areas of Particular Concern (APCs)</strong></td>
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<td></td>
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<td></td>
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</tr>
<tr>
<td>APCs include POI-09, POI-14, SS-109 (i.e., TP-09), SS-90, SS-97, SS-103, and SS-118. Assumed 1-acre remediation for each APC.</td>
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<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Remediation area:</td>
<td>7.0</td>
<td>acres</td>
<td></td>
<td>31,200</td>
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<tr>
<td>Flood hazard area (FHA):</td>
<td>4.0</td>
<td>acres</td>
<td>including APCs POI-9, POI-14, SS-109, and SS-118</td>
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<tr>
<td>Surface Debris Area:</td>
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<td>acres</td>
<td>including APCs POI-9 and POI-14</td>
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</tr>
<tr>
<td>Wetland impact area:</td>
<td>4.8</td>
<td>acres</td>
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<td>33,000</td>
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<tr>
<td>Remediation area perimeter:</td>
<td>5,200</td>
<td>feet</td>
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<tr>
<td><strong>Site Preparation</strong></td>
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<td></td>
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<tr>
<td>Silt fence (perimeter of each APC)</td>
<td>$ 5</td>
<td>lin ft</td>
<td>6,240</td>
<td>$ 31,200</td>
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<tr>
<td>Turbidity curtain</td>
<td>$ 10</td>
<td>lin ft</td>
<td>5,200</td>
<td>$ 52,000</td>
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<tr>
<td>Clearing/grubbing</td>
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<td>acre</td>
<td>8.4</td>
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<td>Relocation of surface debris using LGP equipment</td>
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<td>cyd</td>
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<td><strong>Excavate and Dispose Offsite</strong></td>
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<td>Excavate 2-ft thick impacted soil</td>
<td>$ 20</td>
<td>cyd</td>
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<td>Off-site transportation</td>
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<td>22,600</td>
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<td>Off-site disposal (hazardous waste)</td>
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<td>Off-site disposal (non-hazardous waste)</td>
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<td>Backfill with offsite soil (e.g., loam)</td>
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<td>cyd</td>
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<td>Wetland restoration (re-vegetation)</td>
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<td><strong>Subtotal</strong></td>
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<td><strong>E - 25-Acre Selected Area (Functional Area 1)</strong></td>
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<td>Remediation area:</td>
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<tr>
<td>Flood hazard area (FHA):</td>
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<td>acres</td>
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<tr>
<td>Wetland impact area:</td>
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<td>acres</td>
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<tr>
<td>Remediation area perimeter:</td>
<td>6,100</td>
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<td><strong>Site Preparation</strong></td>
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<td>lin ft</td>
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<td>$ 15,300</td>
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<tr>
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<td>$ 2,000</td>
<td>acre</td>
<td>30</td>
<td>$ 60,000</td>
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<td>Regrade ground to design grades (including 3-ft soil/waste relocation in FHA)</td>
<td>$ 10</td>
<td>cyd</td>
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<td>$ 1,210,000</td>
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<td><strong>Final Closure Cap</strong></td>
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<td>Subtitle D cap</td>
<td>$ 220,000</td>
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<td>Stormwater basin</td>
<td>$ 20,000 to $ 40,000</td>
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<td>Perimeter anchor trench</td>
<td>$ 2</td>
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<td>4,270</td>
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<td>$ 65</td>
<td>lin ft</td>
<td>1,830</td>
<td>$ 119,000</td>
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<td>Passive LFG control (vents or vents &amp; trenches)</td>
<td>$ 4,000 to $ 6,000</td>
<td>acre</td>
<td>25</td>
<td>$ 125,000</td>
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<td>Wetland 1:1 on-Site reconstruction</td>
<td>$ 150,000</td>
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<td>3.0</td>
<td>$ 450,000</td>
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<td><strong>Subtotal</strong></td>
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**Table 6-6c**  
Construction Cost Estimate for Soil Alternative No. 3c  
Rolling Knolls Landfill Superfund Site - Feasibility Study  
Chatham, New Jersey  

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<thead>
<tr>
<th>Component</th>
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<th>Quantity</th>
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<td>acre</td>
<td>1</td>
<td>$3,300</td>
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<tr>
<td>2-ft soil (veg. support + topsoil) and hydroteed</td>
<td>$118,750</td>
<td>acre</td>
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<td>$118,800</td>
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<td><strong>Subtotal</strong></td>
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<td>$195,000</td>
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<td>each</td>
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<td>$8,000</td>
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<td>$800</td>
<td>each</td>
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<td><strong>Subtotal</strong></td>
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<td>Institutional controls</td>
<td>$10,000</td>
<td>est.</td>
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<td>$10,000</td>
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<td>Reporting to EPA</td>
<td>$4,000</td>
<td>every 5-yrs</td>
<td>6</td>
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<td>Reporting to NJ</td>
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<td>every 2-yrs</td>
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<td><strong>Subtotal</strong></td>
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<tr>
<td><strong>I - Post-Remedy Operation &amp; Maintenance</strong></td>
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<tr>
<td>Maintenance of Vegetation Areas (Item F)</td>
<td>$1,300 to $3,700</td>
<td>annual</td>
<td>30</td>
<td>$109,800</td>
</tr>
<tr>
<td>Landfill monitoring/maintenance</td>
<td>$20,000 to $50,000</td>
<td>annual</td>
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<td>$1,536,600</td>
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<tr>
<td>Fence O&amp;M</td>
<td>$2,100 to $6,200</td>
<td>annual</td>
<td>30</td>
<td>$182,200</td>
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<tr>
<td>Wetland mitigation monitoring/maintenance</td>
<td>$37,500 to $50,000</td>
<td>annual</td>
<td>5</td>
<td>$230,000</td>
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<tr>
<td><strong>Subtotal</strong></td>
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<td></td>
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<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td></td>
<td>$21,099,000</td>
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</table>

**Notes:**
(1) See Table 6-4 for cost estimate assumptions, notes, and limitations.
(2) Construction cost to estimate these items include the costs of Items C through G.
<table>
<thead>
<tr>
<th>Component</th>
<th>Range</th>
<th>Unit Cost</th>
<th>Unit</th>
<th>Quantity</th>
<th>Construction Cost Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A - Design/Construction Oversight/Permits</strong></td>
<td></td>
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<tr>
<td>2-ft Excavation of Selected Area</td>
<td>0.5% to 1%</td>
<td>% Construction(2)</td>
<td>27,627,100</td>
<td>$207,300</td>
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</tr>
<tr>
<td>Pre-Design Investigation</td>
<td></td>
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</tr>
<tr>
<td>Remedial Design</td>
<td>0.5% to 1%</td>
<td>% Construction(2)</td>
<td>27,627,100</td>
<td>$207,300</td>
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<tr>
<td>Remedial Oversight</td>
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<td>% Construction(2)</td>
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<td>% Construction(2)</td>
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</tr>
<tr>
<td>Remedial Design</td>
<td>0.5% to 1%</td>
<td>% Construction(2)</td>
<td>49,012,500</td>
<td>$367,600</td>
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<td>Remedial Oversight</td>
<td>5% to 10%</td>
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<td><strong>B - Construction Preparation</strong></td>
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<tr>
<td>2-ft Excavation of Selected Area</td>
<td>0.05% to 0.10%</td>
<td>% Construction(2)</td>
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<tr>
<td>Mobilization/Demobilization</td>
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<td>4-ft Excavation of Selected Area</td>
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<td>Bonding, insurance etc.</td>
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<tr>
<td>Mobilization/Demobilization</td>
<td>0.25% to 0.75%</td>
<td>% Construction(2)</td>
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<td><strong>Subtotal (Option 2: 4-ft Excavation of Selected Area)</strong></td>
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<td>$281,900</td>
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<td><strong>C - General Construction and Site Management</strong></td>
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</tr>
<tr>
<td>Site management and facilities</td>
<td>$5,000 to $20,000</td>
<td>per mth</td>
<td>24</td>
<td>$300,000</td>
<td></td>
</tr>
<tr>
<td>Survey (topo, wetlands, etc.)</td>
<td>$75,000 to $100,000</td>
<td>est.</td>
<td>1</td>
<td>$87,500</td>
<td></td>
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<tr>
<td>Britten Road entrance overlay</td>
<td>$5.5 to $6.5</td>
<td>sft</td>
<td>35,000</td>
<td>$210,000</td>
<td></td>
</tr>
<tr>
<td>Construction entrance</td>
<td>$5,000 to $10,000</td>
<td>est.</td>
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<td>$7,500</td>
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<tr>
<td>Traffic management</td>
<td>$2,000 to $10,000</td>
<td>mth</td>
<td>20</td>
<td>$120,000</td>
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<tr>
<td>Demolition existing structures and place in LF</td>
<td>$10,000 to $25,000</td>
<td>est.</td>
<td>1</td>
<td>$17,500</td>
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<tr>
<td>25-ft wide construction access road</td>
<td>$100 to $200</td>
<td>lin ft</td>
<td>5,600</td>
<td>$840,000</td>
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<tr>
<td>15-ft wide permanent access road (half of perimeter)</td>
<td>$60 to $120</td>
<td>lin ft</td>
<td>5,600</td>
<td>$504,000</td>
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</tr>
<tr>
<td>Structural BMP (bog turtle)</td>
<td>$20,000 to $40,000</td>
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<td>$30,000</td>
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<tr>
<td><strong>Subtotal</strong></td>
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<td></td>
<td></td>
<td></td>
<td>$2,116,500</td>
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</tbody>
</table>
### Table 6-7a

**Construction Cost Estimate for Soil Alternative No. 4a**

**Rolling Knolls Landfill Superfund Site - Feasibility Study**

**Chatham, New Jersey**

<table>
<thead>
<tr>
<th>Component</th>
<th>Range Unit Cost</th>
<th>Unit</th>
<th>Quantity</th>
<th>Construction Cost Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>D - Areas of Particular Concern (APCs)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>APCs include POI-09, POI-14, SS-109 (i.e., TP-09), SS-90, SS-97, SS-103, and SS-118. Assumed 1-acre remediation for each APC.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Remediation area:</td>
<td>7.0</td>
<td>acres</td>
<td></td>
<td>$31,200</td>
</tr>
<tr>
<td>Flood hazard area (FHA):</td>
<td>4.0</td>
<td>acres</td>
<td>including APCs POI-9, POI-14, SS-109, and SS-118</td>
<td>$52,000</td>
</tr>
<tr>
<td>Surface Debris Area:</td>
<td>2.0</td>
<td>acres</td>
<td>including APCs POI-9 and POI-14</td>
<td>$16,800</td>
</tr>
<tr>
<td>Wetland impact area:</td>
<td>4.8</td>
<td>acres</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Remediation area perimeter:</td>
<td>5,200</td>
<td>feet</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Site Preparation</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Silt fence (perimeter of each APC)</td>
<td>$5</td>
<td>lin ft</td>
<td>6,240</td>
<td>$31,200</td>
</tr>
<tr>
<td>Turbidity curtain</td>
<td>$10</td>
<td>lin ft</td>
<td>5,200</td>
<td>$52,000</td>
</tr>
<tr>
<td>Clearing/grubbing</td>
<td>$2,000</td>
<td>acre</td>
<td>8.4</td>
<td>$16,800</td>
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<tr>
<td>Relocation of surface debris using LGP equipment</td>
<td>$10</td>
<td>cyd</td>
<td>3,300</td>
<td>$33,000</td>
</tr>
<tr>
<td><strong>Cap In-Place</strong></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Excavate/relocate 3-ft soil in FHA</td>
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<td></td>
<td></td>
<td></td>
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<tr>
<td>Subtitle D cap (see Table 6-4 for details)</td>
<td>$220,000</td>
<td>acre</td>
<td>7</td>
<td>$1,540,000</td>
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<tr>
<td>Stormwater basin (one basin per each APC)</td>
<td>$20,000 to $40,000 est.</td>
<td></td>
<td>7</td>
<td>$210,000</td>
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<tr>
<td>Perimeter anchor trench</td>
<td>$2</td>
<td>lin ft</td>
<td>2,600</td>
<td>$5,200</td>
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<tr>
<td>Landform plus enhanced AT</td>
<td>$65</td>
<td>lin ft</td>
<td>2,600</td>
<td>$169,000</td>
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<tr>
<td>Passive LFG control (vents or vents &amp; trenches)</td>
<td>$4,000 to $6,000 acre</td>
<td></td>
<td>7</td>
<td>$35,000</td>
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<tr>
<td>Wetland 1:1 on-Site reconstruction</td>
<td>$150,000</td>
<td>acre</td>
<td>4.0</td>
<td>$600,000</td>
</tr>
<tr>
<td>Wetland restoration (re-vegetation)</td>
<td>$3,000</td>
<td>acre</td>
<td>0.8</td>
<td>$2,400</td>
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<tr>
<td><strong>Subtotal</strong></td>
<td></td>
<td></td>
<td></td>
<td>$3,082,600</td>
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</tbody>
</table>
Table 6-7a
Construction Cost Estimate for Soil Alternative No. 4a
Rolling Knolls Landfill Superfund Site - Feasibility Study
Chatham, New Jersey

<table>
<thead>
<tr>
<th>Component</th>
<th>Range Unit Cost</th>
<th>Unit</th>
<th>Quantity</th>
<th>Construction Cost Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Site Preparation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Silt fence</td>
<td>$5</td>
<td>lin ft</td>
<td>7,320</td>
<td>$36,600</td>
</tr>
<tr>
<td>Turbidity curtain</td>
<td>$10</td>
<td>lin ft</td>
<td>1,525</td>
<td>$15,300</td>
</tr>
<tr>
<td>Clearing/grubbing</td>
<td>$20</td>
<td>acre</td>
<td>600</td>
<td>$60,000</td>
</tr>
</tbody>
</table>

| 2-ft Excavate and Dispose Offsite | | | | |
| 2-ft excavation | $15 | cyd | 80,700 | $1,210,500 |
| Off-site transportation | $5 to $10 | ton | 80,700 | $605,300 |
| Off-site disposal (hazardous waste) | $200 to $500 | ton | 40,350 | $14,122,500 |
| Off-site disposal (non-hazardous waste) | $40 to $70 | ton | 40,350 | $2,219,300 |
| Backfill with off-site soil | $40 | cyd | 80,700 | $3,228,000 |

| 4-ft Excavate and Dispose Offsite | | | | |
| 4-ft excavation | $15 | cyd | 161,400 | $2,421,000 |
| Off-site transportation | $5 to $10 | ton | 161,400 | $1,210,500 |
| Off-site disposal (hazardous waste) | $200 to $500 | ton | 80,700 | $28,245,000 |
| Off-site disposal (non-hazardous waste) | $40 to $70 | ton | 80,700 | $4,438,500 |
| Backfill with off-site soil | $40 | cyd | 161,400 | $6,456,000 |

| Wetland 1:1 on-Site reconstruction | $150,000 | acre | 4.0 | $600,000 |
| Wetland restoration (re-vegetation) | $3,000 | acre | 1 | $3,000 |

| Subtotal (Option 1: 2-ft Excavation of Selected Area) | $22,100,500 |
| Subtotal (Option 2: 4-ft Excavation of Selected Area) | $43,485,900 |

F - Vegetation of Non-Vegetated Areas
| Outside of FHA | 2 | acres | | |
| Scarify, fertilize, and hydroseed | $3,300 | acre | 1 | $3,300 |
| 2-ft soil (veg. support + topsoil), and hydroseed | $118,750 | acre | 1 | $118,800 |

| Subtotal | $122,100 |
### Table 6-7a
Construction Cost Estimate for Soil Alternative No. 4a
Rolling Knolls Landfill Superfund Site - Feasibility Study
Chatham, New Jersey

<table>
<thead>
<tr>
<th>Component</th>
<th>Range Unit Cost</th>
<th>Unit</th>
<th>Quantity</th>
<th>Construction Cost Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>G - Site Controls (physical)</strong></td>
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<td></td>
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<tr>
<td>7-ft high perimeter fence</td>
<td>$30</td>
<td>lin ft</td>
<td>6,500</td>
<td>$195,000</td>
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<tr>
<td>20-ft wide double access gates</td>
<td>$4,000</td>
<td>each</td>
<td>2</td>
<td>$8,000</td>
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<tr>
<td>3-ft wide man gates</td>
<td>$800</td>
<td>each</td>
<td>3</td>
<td>$2,400</td>
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<tr>
<td><strong>Subtotal</strong></td>
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<td></td>
<td></td>
<td>$205,400</td>
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<td><strong>H - Site Controls (administrative)</strong></td>
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<td>Institutional controls</td>
<td>$10,000</td>
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<tr>
<td>Reporting to EPA</td>
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<td>every 5-yrs</td>
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<td>Reporting to NJ</td>
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<td>every 2-yrs</td>
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<td>$60,000</td>
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<td><strong>Subtotal</strong></td>
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<td><strong>I - Post-Remedy Operation &amp; Maintenance</strong></td>
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<tr>
<td>Maintenance of Vegetation Areas (Item F)</td>
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<td>annual</td>
<td>30</td>
<td>$109,800</td>
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<tr>
<td>Landfill monitoring/maintenance</td>
<td>$20,000 to $50,000</td>
<td>annual</td>
<td>30</td>
<td>$1,536,600</td>
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<td>Fence O&amp;M</td>
<td>$2,100 to $6,200</td>
<td>annual</td>
<td>30</td>
<td>$182,200</td>
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<td>Wetland mitigation monitoring/maintenance</td>
<td>$37,500 to $50,000</td>
<td>annual</td>
<td>5</td>
<td>$230,000</td>
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<tr>
<td><strong>Subtotal</strong></td>
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<td></td>
<td>$2,058,600</td>
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</table>

**Total (Option 1 - 2-ft Excavation of Selected Area)** $32,426,000

**Total (Option 2 - 4-ft Excavation of Selected Area)** $55,859,000

Notes:
1. See Table 6-4 for cost estimate assumptions, notes, and limitations.
2. Construction cost to estimate these items include the costs of Items C through G.
### Table 6-7b
Construction Cost Estimate for Soil Alternative No. 4b
Rolling Knolls Landfill Superfund Site - Feasibility Study
Chatham, New Jersey

<table>
<thead>
<tr>
<th>Component</th>
<th>Range Unit Cost</th>
<th>Unit</th>
<th>Quantity</th>
<th>Construction Cost Estimate</th>
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<tr>
<td><strong>A - Design/Construction Oversight/Permits</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>2-ft Excavation of Selected Area</strong></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Pre-Design Investigation</td>
<td>0.5% to 1%</td>
<td>% Construction(2)</td>
<td>$30,793,900</td>
<td>$231,000</td>
</tr>
<tr>
<td>Remedial Design</td>
<td>0.5% to 1%</td>
<td>% Construction(2)</td>
<td>$30,793,900</td>
<td>$231,000</td>
</tr>
<tr>
<td>Remedial Oversight</td>
<td>5% to 10%</td>
<td>% Construction(2)</td>
<td>$30,793,900</td>
<td>$2,309,600</td>
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<tr>
<td><strong>4-ft Excavation of Selected Area</strong></td>
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<tr>
<td>Pre-Design Investigation</td>
<td>0.5% to 1%</td>
<td>% Construction(2)</td>
<td>$52,179,300</td>
<td>$391,400</td>
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<tr>
<td>Remedial Design</td>
<td>0.5% to 1%</td>
<td>% Construction(2)</td>
<td>$52,179,300</td>
<td>$391,400</td>
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<tr>
<td>Remedial Oversight</td>
<td>5% to 10%</td>
<td>% Construction(2)</td>
<td>$52,179,300</td>
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<td><strong>Subtotal (Option 1: 2-ft Excavation of Selected Area)</strong></td>
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<td>$2,771,600</td>
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<td><strong>Subtotal (Option 2: 4-ft Excavation of Selected Area)</strong></td>
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<td>$4,696,300</td>
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<tr>
<td><strong>B - Construction Preparation</strong></td>
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<td></td>
<td></td>
</tr>
<tr>
<td><strong>2-ft Excavation of Selected Area</strong></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Bonding, insurance etc.</td>
<td>0.05% to 0.10%</td>
<td>% Construction(2)</td>
<td>$30,793,900</td>
<td>$23,100</td>
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<tr>
<td>Mobilization/Demobilization</td>
<td>0.25% to 0.75%</td>
<td>% Construction(2)</td>
<td>$30,793,900</td>
<td>$154,000</td>
</tr>
<tr>
<td><strong>4-ft Excavation of Selected Area</strong></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Bonding, insurance etc.</td>
<td>0.05% to 0.10%</td>
<td>% Construction(2)</td>
<td>$52,179,300</td>
<td>$39,200</td>
</tr>
<tr>
<td>Mobilization/Demobilization</td>
<td>0.25% to 0.75%</td>
<td>% Construction(2)</td>
<td>$52,179,300</td>
<td>$260,900</td>
</tr>
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<td><strong>Subtotal (Option 1: 2-ft Excavation of Selected Area)</strong></td>
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<td></td>
<td>$177,100</td>
</tr>
<tr>
<td><strong>Subtotal (Option 2: 4-ft Excavation of Selected Area)</strong></td>
<td></td>
<td></td>
<td></td>
<td>$300,100</td>
</tr>
<tr>
<td><strong>C - General Construction and Site Management</strong></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Site management and facilities</td>
<td>$5,000 to $20,000</td>
<td>per mth</td>
<td>24</td>
<td>$300,000</td>
</tr>
<tr>
<td>Survey (topo, wetlands, etc.)</td>
<td>$75,000 to $100,000</td>
<td>est.</td>
<td>1</td>
<td>$87,500</td>
</tr>
<tr>
<td>Britten Road entrance overlay</td>
<td>$5.5 to $6.5</td>
<td>sft</td>
<td>35,000</td>
<td>$210,000</td>
</tr>
<tr>
<td>Construction entrance</td>
<td>$5,000 to $10,000</td>
<td>est.</td>
<td>1</td>
<td>$7,500</td>
</tr>
<tr>
<td>Traffic management</td>
<td>$2,000 to $10,000</td>
<td>mth</td>
<td>20</td>
<td>$120,000</td>
</tr>
<tr>
<td>Demolition existing structures and offsite disposal</td>
<td>$10,000 to $25,000</td>
<td>est.</td>
<td>1</td>
<td>$17,500</td>
</tr>
<tr>
<td>25-ft wide construction access road</td>
<td>$100 to $200</td>
<td>lin ft</td>
<td>5,600</td>
<td>$840,000</td>
</tr>
<tr>
<td>15-ft wide permanent access road (half of perimeter)</td>
<td>$60 to $120</td>
<td>lin ft</td>
<td>5,600</td>
<td>$504,000</td>
</tr>
<tr>
<td>Structural BMP (bog turtle)</td>
<td>$20,000 to $40,000</td>
<td>est.</td>
<td>1</td>
<td>$30,000</td>
</tr>
<tr>
<td><strong>Subtotal</strong></td>
<td></td>
<td></td>
<td></td>
<td>$2,116,500</td>
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Geosyntec Consultants
<table>
<thead>
<tr>
<th>Component</th>
<th>Range Unit Cost</th>
<th>Unit</th>
<th>Quantity</th>
<th>Construction Cost Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>D - Areas of Particular Concern (APCs)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>APCs include POI-09, POI-14, SS-109 (i.e., TP-09), SS-90, SS-97, SS-103, and SS-118. Assumed 1-acre remediation for each APC.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Remediation area:</td>
<td>7.0</td>
<td>acres</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flood hazard area (FHA):</td>
<td>4.0</td>
<td>acres</td>
<td>including APCs POI-9, POI-14, SS-109, and SS-118</td>
<td></td>
</tr>
<tr>
<td>Surface Debris Area:</td>
<td>2.0</td>
<td>acres</td>
<td>including APCs POI-9 and POI-14</td>
<td></td>
</tr>
<tr>
<td>Wetland impact area:</td>
<td>4.8</td>
<td>acres</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Remediation area perimeter:</td>
<td>5,200</td>
<td>feet</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Site Preparation</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Silt fence (perimeter of each APC)</td>
<td>$5</td>
<td>lin ft</td>
<td>6,240</td>
<td>$31,200</td>
</tr>
<tr>
<td>Turbidity curtain</td>
<td>$10</td>
<td>lin ft</td>
<td>5,200</td>
<td>$52,000</td>
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<tr>
<td>Clearing/grubbing</td>
<td>$2,000</td>
<td>acre</td>
<td>8.4</td>
<td>$16,800</td>
</tr>
<tr>
<td>Relocation of surface debris using LGP equipment</td>
<td>$10</td>
<td>cyd</td>
<td>3,300</td>
<td>$33,000</td>
</tr>
<tr>
<td><strong>Excavate and Dispose Offsite</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Excavate 2-ft thick impacted soil</td>
<td>$20</td>
<td>cyd</td>
<td>22,600</td>
<td>$452,000</td>
</tr>
<tr>
<td>Off-site transportation</td>
<td>$5 to $10</td>
<td>ton</td>
<td>22,600</td>
<td>$169,500</td>
</tr>
<tr>
<td>Off-site disposal (hazardous waste)</td>
<td>$200 to $500</td>
<td>ton</td>
<td>11,300</td>
<td>$3,955,000</td>
</tr>
<tr>
<td>Off-site disposal (non-hazardous waste)</td>
<td>$40 to $70</td>
<td>ton</td>
<td>11,300</td>
<td>$621,500</td>
</tr>
<tr>
<td>Backfill with offsite soil (e.g., loam)</td>
<td>$40</td>
<td>cyd</td>
<td>22,600</td>
<td>$904,000</td>
</tr>
<tr>
<td>Wetland restoration (re-vegetation)</td>
<td>$3,000</td>
<td>acre</td>
<td>4.8</td>
<td>$14,400</td>
</tr>
<tr>
<td><strong>Subtotal</strong></td>
<td></td>
<td></td>
<td></td>
<td>$6,249,400</td>
</tr>
<tr>
<td><strong>E - 25-Acre Selected Area (Functional Area 1)</strong></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Remediation area:</td>
<td>25</td>
<td>acres</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flood hazard area (FHA):</td>
<td>0</td>
<td>acres</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wetland impact area:</td>
<td>4</td>
<td>acres</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Remediation area perimeter:</td>
<td>6,100</td>
<td>feet</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Site Preparation</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Silt fence</td>
<td>$5</td>
<td>lin ft</td>
<td>7,320</td>
<td>$36,600</td>
</tr>
<tr>
<td>Turbidity curtain</td>
<td>$10</td>
<td>lin ft</td>
<td>1,525</td>
<td>$15,300</td>
</tr>
<tr>
<td>Clearing/grubbing</td>
<td>$2,000</td>
<td>acre</td>
<td>30</td>
<td>$60,000</td>
</tr>
<tr>
<td><strong>2-ft Excavate and Dispose Offsite</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2-ft excavation</td>
<td>$15</td>
<td>cyd</td>
<td>80,700</td>
<td>$1,210,500</td>
</tr>
<tr>
<td>Off-site transportation (hazardous waste)</td>
<td>$5 to $10</td>
<td>ton</td>
<td>80,700</td>
<td>$605,300</td>
</tr>
<tr>
<td>Off-site disposal (hazardous waste)</td>
<td>$200 to $500</td>
<td>ton</td>
<td>40,350</td>
<td>$14,122,500</td>
</tr>
<tr>
<td>Off-site disposal (non-hazardous waste)</td>
<td>$40 to $70</td>
<td>ton</td>
<td>40,350</td>
<td>$2,219,300</td>
</tr>
<tr>
<td>Backfill with off-site soil</td>
<td>$40</td>
<td>cyd</td>
<td>80,700</td>
<td>$3,228,000</td>
</tr>
<tr>
<td><strong>4-ft Excavate and Dispose Offsite</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2-ft excavation</td>
<td>$15</td>
<td>cyd</td>
<td>161,400</td>
<td>$2,421,000</td>
</tr>
<tr>
<td>Off-site transportation (hazardous waste)</td>
<td>$5 to $10</td>
<td>ton</td>
<td>161,400</td>
<td>$1,210,500</td>
</tr>
</tbody>
</table>
### Table 6-7b
**Construction Cost Estimate for Soil Alternative No. 4b**
Rolling Knolls Landfill Superfund Site - Feasibility Study
Chatham, New Jersey

<table>
<thead>
<tr>
<th>Component</th>
<th>Range Unit Cost</th>
<th>Unit</th>
<th>Quantity</th>
<th>Construction Cost Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Off-site disposal (hazardous waste)</td>
<td>$ 200 to $ 500</td>
<td>ton</td>
<td>80,700</td>
<td>$ 28,245,000</td>
</tr>
<tr>
<td>Off-site disposal (non-hazardous waste)</td>
<td>$ 40 to $ 70</td>
<td>ton</td>
<td>80,700</td>
<td>$ 4,438,500</td>
</tr>
<tr>
<td>Backfill with off-site soil</td>
<td>$ 40</td>
<td>cyd</td>
<td>161,400</td>
<td>$ 6,456,000</td>
</tr>
<tr>
<td>Wetland 1:1 on-Site reconstruction</td>
<td>$ 150,000</td>
<td>acre</td>
<td>4.0</td>
<td>$ 600,000</td>
</tr>
<tr>
<td>Wetland restoration (re-vegetation)</td>
<td>$ 3,000</td>
<td>acre</td>
<td>1</td>
<td>$ 3,000</td>
</tr>
<tr>
<td><strong>Subtotal (Option 1: 2-ft Excavation of Selected Area)</strong></td>
<td></td>
<td></td>
<td></td>
<td><strong>$ 22,100,500</strong></td>
</tr>
<tr>
<td><strong>Subtotal (Option 2: 4-ft Excavation of Selected Area)</strong></td>
<td></td>
<td></td>
<td></td>
<td><strong>$ 43,485,900</strong></td>
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#### F - Vegetation of Non-Vegetated Areas

<table>
<thead>
<tr>
<th>Item</th>
<th>Range Unit Cost</th>
<th>Unit</th>
<th>Quantity</th>
<th>Construction Cost Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Outside of FHA</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Scarify, fertilize, and hydroseed</td>
<td>$ 3,300</td>
<td>acre</td>
<td>1</td>
<td>$ 3,300</td>
</tr>
<tr>
<td>2-ft soil (veg. support + topsoil), and hydroseed</td>
<td>$ 118,750</td>
<td>acre</td>
<td>1</td>
<td>$ 118,800</td>
</tr>
<tr>
<td><strong>Subtotal</strong></td>
<td></td>
<td></td>
<td></td>
<td><strong>$ 122,100</strong></td>
</tr>
</tbody>
</table>

#### G - Site Controls (physical)

<table>
<thead>
<tr>
<th>Item</th>
<th>Range Unit Cost</th>
<th>Unit</th>
<th>Quantity</th>
<th>Construction Cost Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>7-ft high perimeter fence</td>
<td>$ 30</td>
<td>lin ft</td>
<td>6,500</td>
<td>$ 195,000</td>
</tr>
<tr>
<td>20-ft wide double access gates</td>
<td>$ 4,000</td>
<td>each</td>
<td>2</td>
<td>$ 8,000</td>
</tr>
<tr>
<td>3-ft wide man gates</td>
<td>$ 800</td>
<td>each</td>
<td>3</td>
<td>$ 2,400</td>
</tr>
<tr>
<td><strong>Subtotal</strong></td>
<td></td>
<td></td>
<td></td>
<td><strong>$ 205,400</strong></td>
</tr>
</tbody>
</table>

#### H - Site Controls (administrative)

<table>
<thead>
<tr>
<th>Item</th>
<th>Range Unit Cost</th>
<th>Unit</th>
<th>Quantity</th>
<th>Construction Cost Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Institutional controls</td>
<td>$ 10,000</td>
<td>est.</td>
<td>1</td>
<td>$ 10,000</td>
</tr>
<tr>
<td>Reporting to EPA</td>
<td>$ 4,000</td>
<td>every 5-ys</td>
<td>6</td>
<td>$ 24,000</td>
</tr>
<tr>
<td>Reporting to NJ</td>
<td>$ 4,000</td>
<td>every 2-ys</td>
<td>15</td>
<td>$ 60,000</td>
</tr>
<tr>
<td><strong>Subtotal</strong></td>
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<td></td>
<td></td>
<td><strong>$ 94,000</strong></td>
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#### I - Post-Remedy Operation & Maintenance

<table>
<thead>
<tr>
<th>Item</th>
<th>Range Unit Cost</th>
<th>Unit</th>
<th>Quantity</th>
<th>Construction Cost Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maintenance of Vegetation Areas (Item F)</td>
<td>$ 1,300 to $ 3,700</td>
<td>annual</td>
<td>30</td>
<td>$ 109,800</td>
</tr>
<tr>
<td>Fence O&amp;M</td>
<td>$ 2,100 to $ 6,200</td>
<td>annual</td>
<td>30</td>
<td>$ 182,200</td>
</tr>
<tr>
<td>Wetland mitigation monitoring/maintenance</td>
<td>$ 37,500 to $ 50,000</td>
<td>annual</td>
<td>5</td>
<td>$ 230,000</td>
</tr>
<tr>
<td><strong>Subtotal</strong></td>
<td></td>
<td></td>
<td></td>
<td><strong>$ 522,000</strong></td>
</tr>
</tbody>
</table>

**Total (Option 1 - 2-ft Excavation of Selected Area)** $ 34,359,000
**Total (Option 2 - 4-ft Excavation of Selected Area)** $ 57,792,000

**Notes:**
(1) See Table 6-4 for cost estimate assumptions, notes, and limitations.
(2) Construction cost to estimate these items include the costs of Items C through G.
### Table 6-8
Construction Cost Estimate for Soil Alternative No. 5
Rolling Knolls Landfill Superfund Site - Feasibility Study
Chatham, New Jersey

<table>
<thead>
<tr>
<th>Component</th>
<th>Range Unit Cost</th>
<th>Unit</th>
<th>Quantity</th>
<th>Construction Cost Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A - Design/Construction Oversight/Permits</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre-Design Investigation</td>
<td>0.5% to 2%</td>
<td>%</td>
<td>45,720,900</td>
<td>$ 571,600</td>
</tr>
<tr>
<td>Remedial Design</td>
<td>0.5% to 2%</td>
<td>%</td>
<td>45,720,900</td>
<td>$ 571,600</td>
</tr>
<tr>
<td>Remedial Oversight</td>
<td>5% to 10%</td>
<td>%</td>
<td>3,429,100</td>
<td>$ 3,429,100</td>
</tr>
<tr>
<td><strong>Subtotal</strong></td>
<td></td>
<td></td>
<td>4,572,300</td>
<td>$ 4,572,300</td>
</tr>
<tr>
<td><strong>B - Construction Preparation</strong></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bonding, insurance etc.</td>
<td>0.05% to 0.10%</td>
<td>%</td>
<td>45,720,900</td>
<td>$ 34,300</td>
</tr>
<tr>
<td>Mobilization/demobilization</td>
<td>0.50% to 1%</td>
<td>%</td>
<td>45,720,900</td>
<td>$ 343,000</td>
</tr>
<tr>
<td><strong>Subtotal</strong></td>
<td></td>
<td></td>
<td>377,300</td>
<td>$ 377,300</td>
</tr>
<tr>
<td><strong>C - General Construction and Site Management</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Site management and facilities</td>
<td>$ 5,000 to $ 20,000</td>
<td>per mth</td>
<td>36</td>
<td>$ 450,000</td>
</tr>
<tr>
<td>Survey (topo., wetlands, etc.)</td>
<td>$ 75,000 to $ 100,000</td>
<td>est.</td>
<td>1</td>
<td>$ 87,500</td>
</tr>
<tr>
<td>Britten Road entrance overlay</td>
<td>$ 5.5 to $ 6.5</td>
<td>sft</td>
<td>35,000</td>
<td>$ 210,000</td>
</tr>
<tr>
<td>Construction entrance</td>
<td>$ 5,000 to $ 10,000</td>
<td>est.</td>
<td>1</td>
<td>$ 7,500</td>
</tr>
<tr>
<td>Traffic management</td>
<td>$ 2,000 to $ 10,000</td>
<td>mth</td>
<td>24</td>
<td>$ 144,000</td>
</tr>
<tr>
<td>Demolition existing structures and place in LF</td>
<td>$ 10,000 to $ 25,000</td>
<td>est.</td>
<td>1</td>
<td>$ 17,500</td>
</tr>
<tr>
<td>25-ft wide construction access road</td>
<td>$ 100 to $ 200</td>
<td>lin ft</td>
<td>5,600</td>
<td>$ 840,000</td>
</tr>
<tr>
<td>15-ft wide permanent access road (half of perimeter)</td>
<td>$ 60 to $ 120</td>
<td>lin ft</td>
<td>5,600</td>
<td>$ 504,000</td>
</tr>
<tr>
<td>Structural BMP (bog turtle)</td>
<td>$ 20,000 to $ 40,000</td>
<td>est.</td>
<td>1</td>
<td>$ 30,000</td>
</tr>
<tr>
<td><strong>Subtotal</strong></td>
<td></td>
<td></td>
<td>2,290,500</td>
<td>$ 2,290,500</td>
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</table>
### Table 6-8
Construction Cost Estimate for Soil Alternative No. 5
Rolling Knolls Landfill Superfund Site - Feasibility Study
Chatham, New Jersey

<table>
<thead>
<tr>
<th>Component</th>
<th>Range Unit Cost</th>
<th>Unit</th>
<th>Quantity</th>
<th>Construction Cost Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>D - Areas of Particular Concern (APCs)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>APCs include POI-09 and POI-14. Assumed 1-acre remediation for each APC.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Remediation area:</td>
<td>2.0</td>
<td>acres</td>
<td></td>
<td>$9,000</td>
</tr>
<tr>
<td>Flood hazard area (FHA):</td>
<td>2.0</td>
<td>acres</td>
<td>including APCs POI-9, POI-14, SS-109, and SS-118</td>
<td>$15,000</td>
</tr>
<tr>
<td>Surface Debris Area:</td>
<td>2.0</td>
<td>acres</td>
<td>including APCs POI-9 and POI-14</td>
<td>$4,800</td>
</tr>
<tr>
<td>Wetland impact area:</td>
<td>2.4</td>
<td>acres</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Remediation area perimeter:</td>
<td>1500</td>
<td>feet</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Site Preparation</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Silt fence (perimeter of each APC)</td>
<td>$5</td>
<td>5</td>
<td>lin ft</td>
<td>1,800</td>
</tr>
<tr>
<td>Turbidity curtain</td>
<td>$10</td>
<td>1</td>
<td>lin ft</td>
<td>1,500</td>
</tr>
<tr>
<td>Clearing/grubbing</td>
<td>$2,000</td>
<td>1</td>
<td>acre</td>
<td>2.4</td>
</tr>
<tr>
<td>Relocation of surface debris using LGP equipment</td>
<td>$3,300</td>
<td>1</td>
<td>cyd</td>
<td>3,300</td>
</tr>
<tr>
<td><strong>Consolidate Impacted Soil Under Selected 25-Acre Cap Area</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Remove/relocate 2-ft thick impacted soil</td>
<td>$20</td>
<td>1</td>
<td>cyd</td>
<td>6,500</td>
</tr>
<tr>
<td>Backfill with offsite soil (e.g., loam)</td>
<td>$40</td>
<td>1</td>
<td>cyd</td>
<td>6,500</td>
</tr>
<tr>
<td>Wetland restoration (re-vegetation)</td>
<td>$3,000</td>
<td>1</td>
<td>acre</td>
<td>2.4</td>
</tr>
<tr>
<td><strong>Subtotal (consolidation)</strong></td>
<td></td>
<td></td>
<td></td>
<td>$459,000</td>
</tr>
<tr>
<td><strong>E - Landfill Area 1 (Privately Held)</strong></td>
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<td></td>
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</tr>
<tr>
<td>Buried waste area:</td>
<td>105</td>
<td>acres</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flood hazard area (FHA):</td>
<td>29</td>
<td>acres</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wetland impact area:</td>
<td>9</td>
<td>acres</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Waste area perimeter:</td>
<td>10,825</td>
<td>feet</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Silt fence</td>
<td>$5</td>
<td>5</td>
<td>lin ft</td>
<td>12,990</td>
</tr>
<tr>
<td>Turbidity curtain</td>
<td>$10</td>
<td>1</td>
<td>lin ft</td>
<td>5,413</td>
</tr>
<tr>
<td>Clearing/grubbing</td>
<td>$2,000</td>
<td>1</td>
<td>acre</td>
<td>105.0</td>
</tr>
<tr>
<td>Excavate/relocate 3-ft soil in FHA</td>
<td>$15</td>
<td>1</td>
<td>cyd</td>
<td>140,400</td>
</tr>
<tr>
<td>Soil/waste grading (ave. 2 ft)</td>
<td>$10</td>
<td>1</td>
<td>cyd</td>
<td>245,227</td>
</tr>
<tr>
<td>Subtitle D cap</td>
<td>$220,000</td>
<td>1</td>
<td>acre</td>
<td>105</td>
</tr>
<tr>
<td>Stormwater basin</td>
<td>$20,000</td>
<td>to</td>
<td>$40,000</td>
<td>est.</td>
</tr>
<tr>
<td>Perimeter anchor trench</td>
<td>$2</td>
<td>1</td>
<td>lin ft</td>
<td>3,248</td>
</tr>
<tr>
<td>Landform plus enhanced anchor trench</td>
<td>$65</td>
<td>1</td>
<td>lin ft</td>
<td>7,578</td>
</tr>
<tr>
<td>Passive LFG control (vents or vents &amp; trenches)</td>
<td>$4,000</td>
<td>to</td>
<td>$6,000</td>
<td>acre</td>
</tr>
<tr>
<td>Wetland 1:1 on-Site reconstruction</td>
<td>$150,000</td>
<td>acre</td>
<td>9.0</td>
<td>$1,350,000</td>
</tr>
<tr>
<td>Wetland restoration (re-vegetation)</td>
<td>$3,000</td>
<td>acre</td>
<td>10.5</td>
<td>$31,500</td>
</tr>
<tr>
<td><strong>Subtotal</strong></td>
<td></td>
<td></td>
<td></td>
<td>$30,483,100</td>
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</tbody>
</table>
Table 6-8
Construction Cost Estimate for Soil Alternative No. 5
Rolling Knolls Landfill Superfund Site - Feasibility Study
Chatham, New Jersey

<table>
<thead>
<tr>
<th>Component</th>
<th>Range Unit Cost</th>
<th>Unit</th>
<th>Quantity</th>
<th>Construction Cost Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>F - Landfill Area 2 (Great Swamp National Wildlife Refuge Area)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Buried waste area:</td>
<td></td>
<td></td>
<td>35</td>
<td>acres</td>
</tr>
<tr>
<td>Flood hazard area (FHA):</td>
<td></td>
<td></td>
<td>33</td>
<td>acres</td>
</tr>
<tr>
<td>Wetland impact area:</td>
<td></td>
<td></td>
<td>9.2</td>
<td>acres</td>
</tr>
<tr>
<td>Waste area perimeter:</td>
<td></td>
<td></td>
<td>6,300</td>
<td>feet</td>
</tr>
<tr>
<td>Silt fence</td>
<td>$5</td>
<td>lin ft</td>
<td>7,560</td>
<td>$37,800</td>
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<tr>
<td>Turbidity curtain</td>
<td>$10</td>
<td>lin ft</td>
<td>3,150</td>
<td>$31,500</td>
</tr>
<tr>
<td>Clearing/grubbing</td>
<td>$20</td>
<td>acre</td>
<td>42</td>
<td>$84,500</td>
</tr>
<tr>
<td>Excavate/relocate 3-ft soil in FHA</td>
<td>$15</td>
<td>cyd</td>
<td>159,800</td>
<td>$2,397,000</td>
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<tr>
<td>Soil/waste grading (ave. 2 ft)</td>
<td>$10</td>
<td>cyd</td>
<td>7,099</td>
<td>$71,000</td>
</tr>
<tr>
<td>Subtitle D cap</td>
<td>$220</td>
<td>acre</td>
<td>35.2</td>
<td>$7,744,000</td>
</tr>
<tr>
<td>Stormwater basin</td>
<td>$20,000 to $40,000 est.</td>
<td></td>
<td>2</td>
<td>$60,000</td>
</tr>
<tr>
<td>Perimeter anchor trench</td>
<td>$2</td>
<td>lin ft</td>
<td>1,890</td>
<td>$3,800</td>
</tr>
<tr>
<td>Landform plus enhanced anchor trench</td>
<td>$65</td>
<td>lin ft</td>
<td>4,410</td>
<td>$286,700</td>
</tr>
<tr>
<td>Passive LFG control (vents or vents &amp; trenches)</td>
<td>$4,000 to $6,000 acre</td>
<td></td>
<td>35</td>
<td>$176,000</td>
</tr>
<tr>
<td>Wetland 1:1 on-Site reconstruction</td>
<td>$150,000 acre</td>
<td></td>
<td>9.2</td>
<td>$1,380,000</td>
</tr>
<tr>
<td>Wetland restoration (re-vegetation)</td>
<td>$3,000 acre</td>
<td></td>
<td>3.5</td>
<td>$10,600</td>
</tr>
<tr>
<td><strong>Subtotal</strong></td>
<td></td>
<td></td>
<td></td>
<td>$12,282,900</td>
</tr>
</tbody>
</table>

| **G - Site Controls (physical)** | | | | |
| 7-ft high perimeter fence | $30 | lin ft | 6,500 | $195,000 |
| 20-ft wide double access gates | $4,000 | each | 2 | $8,000 |
| 3-ft wide man gates | $800 | each | 3 | $2,400 |
| **Subtotal** | | | | $205,400 |

| **H - Site Controls (administrative)** | | | | |
| Institutional controls | $10,000 est. | | 1 | $10,000 |
| Reporting to EPA | $4,000 every 5-yrs | | 6 | $24,000 |
| Reporting to NJ | $4,000 every 2-yrs | | 15 | $60,000 |
| **Subtotal** | | | | $94,000 |

| **I - Post-Remedy Operation & Maintenance** | | | | |
| Landfill monitoring/maintenance | $50,000 to $80,000 annual | | 30 | $2,853,700 |
| Fence O&M | $2,100 to $6,200 annual | | 30 | $182,200 |
| Wetland mitigation monitoring/maintenance | $75,000 to $100,000 annual | | 5 | $460,000 |
| **Subtotal** | | | | $3,495,900 |

**Total** | | | | $54,261,000 |

Notes:
1. See Table 6-4 for cost estimate assumptions, notes, and limitations.
2. Construction cost to estimate these items include the costs of Items C through G.
## Summary of Remedial Construction Cost Estimates for Soil Rolling Knolls Landfill Superfund Site – Feasibility Study

Chatham, New Jersey

Geosyntec Consultants

### Table 6-9

<table>
<thead>
<tr>
<th>Component</th>
<th>Alternative No. 1 – No Action</th>
<th>Alternative No. 2 – Site Controls, Capping of Selected Area to Reduce Overall Risk, Remediation (Cap In-Place) of Areas of Particular Concern, and Remediation of Non-Vegetated Areas with Soil Sample Results Above Remediation Goals</th>
<th>Alternative No. 3a</th>
<th>Alternative No. 3b</th>
<th>Alternative No. 3c</th>
<th>Alternative No. 4a</th>
<th>Alternative No. 4b</th>
<th>Alternative No. 5</th>
<th>Alternative No. 6 – Site Controls and Capping of All Landfill Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>Design/Construction Oversight/Feasibility</td>
<td>$0</td>
<td>$1,418,800</td>
<td>$1,418,800</td>
<td>$1,418,800</td>
<td>$1,418,800</td>
<td>$1,418,800</td>
<td>$1,418,800</td>
<td>$1,418,800</td>
<td>$1,418,800</td>
</tr>
<tr>
<td>Construction Preparation</td>
<td>$0</td>
<td>$281,900</td>
<td>$281,900</td>
<td>$281,900</td>
<td>$281,900</td>
<td>$281,900</td>
<td>$281,900</td>
<td>$281,900</td>
<td>$281,900</td>
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<tr>
<td>General Construction and Site Management</td>
<td>$0</td>
<td>$1,981,500</td>
<td>$1,981,500</td>
<td>$1,981,500</td>
<td>$1,981,500</td>
<td>$1,981,500</td>
<td>$1,981,500</td>
<td>$1,981,500</td>
<td>$1,981,500</td>
</tr>
<tr>
<td>Areas of Particular Concern (APCs)</td>
<td>$0</td>
<td>$1,503,400</td>
<td>$1,503,400</td>
<td>$1,503,400</td>
<td>$1,503,400</td>
<td>$1,503,400</td>
<td>$1,503,400</td>
<td>$1,503,400</td>
<td>$1,503,400</td>
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<tr>
<td>25-Acre Selected Area (Functional Area 1)</td>
<td>$0</td>
<td>$7,617,500</td>
<td>$7,617,500</td>
<td>$7,617,500</td>
<td>$7,617,500</td>
<td>$7,617,500</td>
<td>$7,617,500</td>
<td>$7,617,500</td>
<td>$7,617,500</td>
</tr>
<tr>
<td>Entire Landfill (140 acres)</td>
<td>$0</td>
<td>$42,766,000</td>
<td>$42,766,000</td>
<td>$42,766,000</td>
<td>$42,766,000</td>
<td>$42,766,000</td>
<td>$42,766,000</td>
<td>$42,766,000</td>
<td>$42,766,000</td>
</tr>
<tr>
<td>Vegetation of Non-Vegetated Areas</td>
<td>$0</td>
<td>$122,100</td>
<td>$122,100</td>
<td>$122,100</td>
<td>$122,100</td>
<td>$122,100</td>
<td>$122,100</td>
<td>$122,100</td>
<td>$122,100</td>
</tr>
<tr>
<td>Site Controls (physical)</td>
<td>$0</td>
<td>$205,400</td>
<td>$205,400</td>
<td>$205,400</td>
<td>$205,400</td>
<td>$205,400</td>
<td>$205,400</td>
<td>$205,400</td>
<td>$205,400</td>
</tr>
<tr>
<td>Site Controls (administrative)</td>
<td>$0</td>
<td>$94,000</td>
<td>$94,000</td>
<td>$94,000</td>
<td>$94,000</td>
<td>$94,000</td>
<td>$94,000</td>
<td>$94,000</td>
<td>$94,000</td>
</tr>
<tr>
<td>Post-Remedy Operation &amp; Maintenance</td>
<td>$0</td>
<td>$2,058,600</td>
<td>$2,058,600</td>
<td>$2,058,600</td>
<td>$2,058,600</td>
<td>$2,058,600</td>
<td>$2,058,600</td>
<td>$2,058,600</td>
<td>$2,058,600</td>
</tr>
<tr>
<td>Total</td>
<td>$0</td>
<td>$17,390,000</td>
<td>$17,390,000</td>
<td>$17,390,000</td>
<td>$17,390,000</td>
<td>$17,390,000</td>
<td>$17,390,000</td>
<td>$17,390,000</td>
<td>$17,390,000</td>
</tr>
</tbody>
</table>

### Notes:
1. All costs are in 2017 dollars with the exception of Post-Remedy Operation & Maintenance (O&M) costs, which assume 2.5% annual inflation over 30 years for landfill and groundwater O&M and 5 years for wetland mitigation area maintenance.
2. See Tables 6-2, 6-5(a,b,c), 6-6(a,b), and 6-8 for details of cost estimates and Table 6-5 for landfill closure cap details.

---

**Alternative No. 1 – No Action**

- Site Controls, Capping of Selected Area to Reduce Overall Risk, Remediation (Cap In-Place) of Areas of Particular Concern, and Remediation of Non-Vegetated Areas with Soil Sample Results Above Remediation Goals

**Alternative No. 2**

- Site Controls, Capping of Selected Area to Reduce Overall Risk, Remediation (Cap In-Place) of Areas of Particular Concern, and Remediation of Non-Vegetated Areas with Soil Sample Results Above Remediation Goals

**Alternative No. 3a**

- Site Controls, Capping of Selected Area to Reduce Overall Risk, Remediation (Consolidation Under Selected Area Cap) of Areas of Particular Concern, and Remediation of Non-Vegetated Areas with Soil Sample Results Above Remediation Goals

**Alternative No. 3b**

- Site Controls, Capping of Selected Area to Reduce Overall Risk, and Remediation (Cap In-Place) of Areas of Particular Concern, and Remediation of Non-Vegetated Areas with Soil Sample Results Above Remediation Goals

**Alternative No. 3c**

- Site Controls, Capping of Selected Area to Reduce Overall Risk, Remediation (Offsite Disposal) of Areas of Particular Concern, and Remediation of Non-Vegetated Areas with Soil Sample Results Above Remediation Goals

**Alternative No. 4a**

- Site Controls, Excavation and Offsite Disposal of Selected Area to Reduce Overall Risk, Remediation (Cap In-Place) of Areas of Particular Concern, and Remediation of Non-Vegetated Areas with Soil Sample Results Above Remediation Goals

**Alternative No. 4b**

- Site Controls, Excavation and Offsite Disposal of Selected Area to Reduce Overall Risk, Remediation (Offsite Disposal) of Areas of Particular Concern, and Remediation of Non-Vegetated Areas with Soil Sample Results Above Remediation Goals

**Alternative No. 5**

- Site Controls and Capping of All Landfill Material

**Alternative No. 6**

- Site Controls and Capping of All Landfill Material
<table>
<thead>
<tr>
<th>Groundwater Alternatives</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. Overall Protection of Human Health and the Environment</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Human Health Protection</td>
<td>1</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Environmental Protection</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td><strong>2. Compliance with ARARs</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chemical Specific ARARs</td>
<td>1</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Location Specific ARARs</td>
<td>NA</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Action Specific ARARs</td>
<td>NA</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td><strong>3. Long-Term Effectiveness and Permanence</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Magnitude of Residual Risk</td>
<td>1</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Adequacy and Reliability of Controls</td>
<td>NA</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td><strong>4. Reduction of Toxicity, Mobility, and Volume Through Treatment</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Treatment Process used and Materials Treated</td>
<td>1</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>Amount of Hazardous Materials Destroyed or Treated</td>
<td>1</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>Degree of Expected Reductions in Toxicity, Mobility or Volume through Treatment</td>
<td>1</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>Degree to which Treatment is Irreversible</td>
<td>1</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Type and Quantity of Residuals Remaining after Treatment</td>
<td>1</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Whether the Alternative Would Satisfy the Statutory Preference for Treatment as a Principal Element</td>
<td>1</td>
<td>1</td>
<td>4</td>
</tr>
</tbody>
</table>
Table 7-1
Comparative Analysis of Groundwater Remedial Alternatives
Rolling Knolls Landfill Superfund Site
Chatham, New Jersey

<table>
<thead>
<tr>
<th>Groundwater Alternatives</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>5. Short-Term Effectiveness</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Protection of Community During Remedial Actions</td>
<td>NA</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Protection of Workers During Remedial Actions</td>
<td>NA</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Environmental Impacts</td>
<td>NA</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>Time Until Remedial Action Objectives are Achieved</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td><strong>6. Implementability</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ability to Construct and Operate the Technology</td>
<td>NA</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Reliability of the Technology</td>
<td>NA</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Ease of Undertaking Additional Remedial Actions, if necessary</td>
<td>NA</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Ability to Monitor Effectiveness of Remedy</td>
<td>NA</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Ability to Obtain Approvals and Coordinate with Other Agencies</td>
<td>NA</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>Availability of Off-Site Treatment, Storage, and Disposal Services and Capacity</td>
<td>NA</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Availability of Necessary Equipment and Specialists</td>
<td>NA</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Availability of Prospective Technology</td>
<td>NA</td>
<td>4</td>
<td>4</td>
</tr>
</tbody>
</table>
## Table 7-1
Comparative Analysis of Groundwater Remedial Alternatives
Rolling Knolls Landfill Superfund Site
Chatham, New Jersey

<table>
<thead>
<tr>
<th>Groundwater Alternatives</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>7. Costs</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Indirect Capital Cost (Design/Construction Oversight/Permits)</td>
<td>NA</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>Direct Capital Costs</td>
<td>NA</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>Post-Construction Operation, Maintenance, and Monitoring Costs</td>
<td>NA</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Total Costs</td>
<td>NA</td>
<td>$1,345,000</td>
<td>$2,815,000</td>
</tr>
<tr>
<td>8. State (or Support Agency) Acceptance</td>
<td>TBE</td>
<td>TBE</td>
<td>TBE</td>
</tr>
<tr>
<td>9. Community Acceptance</td>
<td>TBE</td>
<td>TBE</td>
<td>TBE</td>
</tr>
</tbody>
</table>

Notes

1. Alternative Description:
   - Alternative 1 - No Action
   - Alternative 2 - Source Control and Monitoring
   - Alternative 3 - Source Control and Monitoring with a Contingent Remedy

2. TBE - To be evaluated. The findings from the detailed analysis of the State (or support agency) acceptance and Community acceptance criteria will be presented in ROD once USEPA completes their review of and provides comments on the final FS report.

3. Comparative analysis grading description: 1 - Poor, 2 - Moderate, 3 - Good, and 4 - Excellent

4. NA - Not applicable.
<table>
<thead>
<tr>
<th>ARAR Type</th>
<th>Requirement</th>
<th>Status</th>
<th>Summary of Requirement</th>
<th>Groundwater Remedy Alternatives</th>
</tr>
</thead>
<tbody>
<tr>
<td>Action-Specific</td>
<td>New Jersey Air Pollution Control Rules (N.J.A.C 7:27)</td>
<td>Potentially Applicable-to remedial activities generating certain air emissions</td>
<td>Establishes standards for the emissions of contaminants into (the ambient atmosphere) air.</td>
<td>NA WBCW WBCW</td>
</tr>
<tr>
<td>Action-Specific</td>
<td>Clean Air Act (42 U.S.C subsections 7401 et seq)</td>
<td>Potentially Applicable-to remedial activities generating certain air emissions</td>
<td>Establishes standards for the emissions of contaminants into (the ambient atmosphere) air.</td>
<td>NA WBCW WBCW</td>
</tr>
<tr>
<td>Action-Specific</td>
<td>Occupation Safety and Health Standards and Safety and Health Regulations for Construction (29 CFR 1910 and 1926)</td>
<td>Relevant and Appropriate – to remedy construction</td>
<td>Establishes occupational safety and health standards.</td>
<td>NA WBCW WBCW</td>
</tr>
<tr>
<td>Action-Specific</td>
<td>Guide to Management of Investigation-Derived Wastes (OSWER Publication 9345.3-03FS)</td>
<td>To Be Considered</td>
<td>Present regulatory background and options for managing investigation-derived waste at Superfund sites.</td>
<td>NA WBCW WBCW</td>
</tr>
<tr>
<td>Action-Specific</td>
<td>New Jersey Field Sampling Procedures Manual, Appendix 6.1, New Jersey Well Standards</td>
<td>To Be Considered</td>
<td>Establishes standards for the construction, maintenance, and sampling of monitoring wells.</td>
<td>NA WBCW WBCW</td>
</tr>
<tr>
<td>Action-Specific</td>
<td>New Jersey Noise Control Rules (N.J.A.C 7:29).</td>
<td>Relevant and Appropriate</td>
<td>Prohibits the generation of certain types of noise at specific times and establishes methods to determine compliance.</td>
<td>NA WBCW WBCW</td>
</tr>
<tr>
<td>Action-Specific</td>
<td>New Jersey Brownfield and Contaminated Site Remediation Act (N.J.S.A. 58:18-B-1 et seq.)</td>
<td>Applicable</td>
<td>Enabling legislation for development of remediation standards necessary to protect public health and safety and the environment from discharged hazardous substances and for mandating cleanup of contaminated sites.</td>
<td>NA WBCW WBCW</td>
</tr>
<tr>
<td>ARAR Type</td>
<td>Requirement</td>
<td>Status</td>
<td>Summary of Requirement</td>
<td>Groundwater Remedy Alternatives</td>
</tr>
<tr>
<td>----------------</td>
<td>------------------------------------------------------------------------------</td>
<td>-------------------</td>
<td>------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>---------------------------------</td>
</tr>
<tr>
<td>Action-Specific</td>
<td>New Jersey Technical Requirements for Site Remediation (N.J.A.C 7:26E)</td>
<td>Applicable</td>
<td>Establishes the technical requirements for the remediation of contaminated sites.</td>
<td>NA</td>
</tr>
<tr>
<td>Action-Specific</td>
<td>Administrative Requirements for the Remediation of Contaminated Sites (N.J.A.C 7:26C)</td>
<td>Applicable</td>
<td>Requirements related to New Jersey's site remediation process.</td>
<td>NA</td>
</tr>
<tr>
<td>Action-Specific</td>
<td>Green Remediation: Incorporating Sustainable Environmental Practices in Remediation of Contaminated Sites (OSWER Publication EPA 542-R-08-002)</td>
<td>To Be Considered</td>
<td>Outlines the principals of green remediation and describes opportunities to reduce the footprint of cleanup activities throughout the life of a project. Identifies new strategies and alternatives to improve sustainability of cleanup activities, and helps decision-makers balance the alternatives within existing regulatory frameworks.</td>
<td>To be considered in the remedial action design</td>
</tr>
<tr>
<td>Action-Specific</td>
<td>RCRA Subtitle D Landfills (40 CFR Parts 239 - 259)</td>
<td>Applicable</td>
<td>These regulations apply to non-hazardous waste landfills, including municipal solid waste landfills</td>
<td>NA</td>
</tr>
<tr>
<td>Action-Specific</td>
<td>Additional, Specific Disposal Regulation for Sanitary Landfills (N.J.A.C. 7:26-2A)</td>
<td>Applicable</td>
<td>State regulations that include the requirements for closure and post-closure of sanitary landfills.</td>
<td>NA</td>
</tr>
<tr>
<td>Action-Specific</td>
<td>New Jersey Solid Waste Rules (N.J.A.C 7:26)</td>
<td>Applicable</td>
<td>Governs the registration, operation, maintenance, and closure of sanitary landfills, other solid waste facilities, and solid waste transportation operations in the State of New Jersey.</td>
<td>NA</td>
</tr>
</tbody>
</table>
### Table 7-2
**Summary of Compliance to Applicable, Relevant or Appropriate Requirements (ARARs) for Groundwater Alternatives**

Rolling Knolls Landfill Superfund Site - Feasibility Study
Chatham, New Jersey

<table>
<thead>
<tr>
<th>ARAR Type</th>
<th>Requirement</th>
<th>Status</th>
<th>Summary of Requirement</th>
<th>Groundwater Remedy Alternatives</th>
</tr>
</thead>
<tbody>
<tr>
<td>Action-Specific</td>
<td>Presumptive Remedy for CERCLA Municipal Landfills (OSWER Directive No. 9355.D-49F)</td>
<td>To Be Considered</td>
<td>This guidance outlines a streamlined approach to the scoping (planning) stages of the RI/FS in the process of closing municipal landfills under CERCLA, with containment as the presumptive remedy. This directive also provides guidance regarding the appropriate level of detail appropriate for risk assessment of source areas and characterization of hot spots.</td>
<td>NA</td>
</tr>
<tr>
<td>Action-Specific</td>
<td>New Jersey Storm Water Management Rules (N.J.A.C 7:8)</td>
<td>Applicable</td>
<td>Establishes stormwater management requirements to prevent contamination of waterways via stormwater discharge.</td>
<td>NA</td>
</tr>
<tr>
<td>Action-Specific</td>
<td>New Jersey Water Pollution Control Act Regulations (N.J.A.C 7:14)</td>
<td>Relevant and Appropriate</td>
<td>Prohibits the discharge of any pollutant into the waters of the State without a valid permit.</td>
<td>NA</td>
</tr>
<tr>
<td>Action-Specific</td>
<td>New Jersey Pollutant Discharge Elimination System Rules (N.J.A.C 7:14A)</td>
<td>Applicable</td>
<td>Establishes the framework under which NJDEP regulates the discharge of pollutants to the surface and groundwater’s of the State.</td>
<td>NA</td>
</tr>
<tr>
<td>Action-Specific</td>
<td>New Jersey Department of Transportation (NIDOT) Standard Specifications – Soil Erosion and Sediment Control Measures (1996) (N.J.A.C. 16:25A-2.1 et seq.)</td>
<td>To Be Considered</td>
<td>NJDOT standards are typically used to develop the appropriate plans for sediment and soil erosion control required under New Jersey Soil Conservation Act.</td>
<td>NA</td>
</tr>
<tr>
<td>Action-Specific</td>
<td>RCRA Generation, Transportation and Disposal of Hazardous waste (40 CFR 260-270)</td>
<td>Potentially Applicable – to the management of waste streams for on-site disposal</td>
<td>Establishes responsibilities and standards for the management of hazardous and non-hazardous waste.</td>
<td>NA</td>
</tr>
<tr>
<td>Action-Specific</td>
<td>49 C.F.R. Hazardous Materials Transportation</td>
<td>Potentially Applicable – to transport of hazardous reagents</td>
<td>Regulates transportation of hazardous materials in the United States under the Department of Transportation (49 CFR).</td>
<td>NA</td>
</tr>
<tr>
<td>ARAR Type</td>
<td>Requirement</td>
<td>Status</td>
<td>Summary of Requirement</td>
<td>Groundwater Remedy Alternatives</td>
</tr>
<tr>
<td>-----------------</td>
<td>------------------------------------------------------------------------------</td>
<td>----------------------</td>
<td>----------------------------------------------------------------------------------------</td>
<td>---------------------------------</td>
</tr>
<tr>
<td>Action-Specific</td>
<td>New Jersey Hazardous Waste Rules (N.J.A.C 7:26G)</td>
<td>Potentially Applicable – to waste streams transported offsite for disposal</td>
<td>Identifies the standards for the acceptable management of hazardous waste in New Jersey.</td>
<td>NA</td>
</tr>
<tr>
<td>Action-Specific</td>
<td>Plant Protection Act (7 U.S.C. Section 2814)</td>
<td>Potentially Applicable - if remedy requires introducing vegetation to any portion of the site</td>
<td>Requires the use of integrated management systems to control or contain undesirable plant species. Applicable to on-site remedial activities to control, eradicate, or prevent or retard the spread of such weeds.</td>
<td>WBCW WBCW WBCW</td>
</tr>
<tr>
<td>Action-Specific</td>
<td>Migratory Bird Treaty Act of 1918 (16 U.S.C. 703-712; 50 CFR 10.13)</td>
<td>Applicable</td>
<td>This Act makes it unlawful to “take, capture, kill,” or otherwise impact a migratory bird or any nest or egg of a migratory bird.</td>
<td>NA WBCW WBCW</td>
</tr>
<tr>
<td>Chemical-Specific</td>
<td>Remediation Standards (N.J.A.C 7:26D; 7:9B; 7:9C)</td>
<td>Applicable</td>
<td>Establishes the minimum standards for the remediation of soil, groundwater, and surface water.</td>
<td>Does not comply WBCW WBCW</td>
</tr>
<tr>
<td>Chemical-Specific</td>
<td>Federal Safe Drinking Water Act (SDWA) Maximum Contaminant Levels (40 CFR 141.11-16, and 60-63)</td>
<td>To Be Considered</td>
<td>Defines the quality criteria for public drinking water supplies.</td>
<td>Does not comply WBCW WBCW</td>
</tr>
<tr>
<td>Chemical-Specific</td>
<td>New Jersey Safe Drinking Water Act (SDWA) Maximum Contaminant Levels (N.J.S.A. 58:12A-1 et seq.)</td>
<td>To Be Considered</td>
<td>Defines the quality criteria for public drinking water supplies.</td>
<td>Does not comply WBCW WBCW</td>
</tr>
</tbody>
</table>
### Table 7-2
Summary of Compliance to Applicable, Relevant or Appropriate Requirements (ARARs) for Groundwater Alternatives
Rolling Knolls Landfill Superfund Site - Feasibility Study
Chatham, New Jersey

<table>
<thead>
<tr>
<th>ARAR Type</th>
<th>Requirement</th>
<th>Status</th>
<th>Summary of Requirement</th>
<th>Groundwater Remedy Alternatives</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemical-Specific</td>
<td>NJDEP Site Remediation Program, Technical Guidance for the Attainment of Remediation Standards and Site-Specific Criteria September 24, 2012, Version 1.0.</td>
<td>To Be Considered</td>
<td>Guidance on alternate methods to achieve compliance with applicable remediation standards.</td>
<td>Does not comply WBCW WBCW</td>
</tr>
<tr>
<td>Chemical-Specific</td>
<td>EPA Human Health Assessment Cancer Slope Factors (CSFs)</td>
<td>To Be Considered</td>
<td>CSFs are developed by EPA for health effects assessments or evaluation by the Human Health Assessment Group. These values present the most up-to-date cancer risk potency information and are used to compute the individual incremental cancer risk resulting from exposure to carcinogens.</td>
<td>NA WBCW WBCW</td>
</tr>
<tr>
<td>Chemical-Specific</td>
<td>NJDEP “NJDEP Ecological Screening Criteria.” March 2009.</td>
<td>To Be Considered</td>
<td>Provides Ecological Screening Criteria to be used as screening values in ecological assessments.</td>
<td>NA NA NA</td>
</tr>
<tr>
<td>Chemical-Specific</td>
<td>RCRA Groundwater Protection Standards and Maximum Concentration Limits (40 CFR 264, Subpart F)</td>
<td>Applicable</td>
<td>Regulates release from the solid management unit (i.e. the landfill) and specifies the groundwater protection standards.</td>
<td>Does not comply WBCW WBCW</td>
</tr>
<tr>
<td>Chemical-Specific</td>
<td>NJDEP Groundwater Quality Standards (N.J.A.C. 7:9C)</td>
<td>Applicable</td>
<td>Establishes the minimum standards for the remediation of groundwater.</td>
<td>Does not comply WBCW WBCW</td>
</tr>
<tr>
<td>Location-Specific</td>
<td>New Jersey Flood Hazard Area Control (N.J.A.C 7:13)</td>
<td>Applicable</td>
<td>Sets forth the requirements governing activities in the flood hazard area or riparian zone of a regulated water.</td>
<td>NA WBCW WBCW</td>
</tr>
<tr>
<td>Location-Specific</td>
<td>EPA’s 1985 “Policy on Floodplains and Wetlands Assessments for CERCLA Actions”.</td>
<td>To Be Considered</td>
<td>Requires that CERCLA actions meet the substantive requirements of Floodplain Management Executive Order (EO 11988) and Protection of Wetlands Executive Order (EO 1990).</td>
<td>NA WBCW WBCW</td>
</tr>
<tr>
<td>ARAR Type</td>
<td>Requirement</td>
<td>Status</td>
<td>Summary of Requirement</td>
<td>Groundwater Remedy Alternatives</td>
</tr>
<tr>
<td>------------------------</td>
<td>------------------------------------------------------------------------------</td>
<td>------------</td>
<td>------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>--------------------------------</td>
</tr>
<tr>
<td>Location-Specific</td>
<td>Executive Order 11988 Floodplain Management</td>
<td>To Be Considered</td>
<td>Requires federal agencies to avoid to the extent possible long- and short-term adverse impacts associated with the occupancy and modification of flood plains, and avoid support of floodplain development wherever there is a practicable alternative.</td>
<td>NA</td>
</tr>
<tr>
<td>Location-Specific</td>
<td>Establishment of a Classification Exception Area/Well Restriction Area (N.J.A.C. 7:9-6.6)</td>
<td>Applicable</td>
<td>Promulgated state regulations that include requirements for establishing a classification exception area/well restriction area where groundwater quality does not meet New Jersey groundwater quality criteria.</td>
<td>NA</td>
</tr>
<tr>
<td>Location-Specific</td>
<td>Ground Water Quality and Surface Water Standards (N.J.A.C 7:9).</td>
<td>Applicable</td>
<td>Regulates activities respecting protection and enhancement of ground water and surface water resources.</td>
<td>NA</td>
</tr>
<tr>
<td>Location-Specific</td>
<td>Federal Water Pollution Control Act (FWPCA) (33 USC 1521 et seq.)</td>
<td>Applicable</td>
<td>Requires a permit from USACE and consideration by both the EPA and the USFWS before an application to dredge and fill may be enacted.</td>
<td>NA</td>
</tr>
<tr>
<td>Location-Specific</td>
<td>New Jersey Freshwater Wetlands Protection Act Rules (N.J.A.C 7:7A)</td>
<td>Applicable</td>
<td>Requires permit for regulated activity disturbing freshwater wetlands.</td>
<td>NA</td>
</tr>
<tr>
<td>Location-Specific</td>
<td>Section 404 - Clean Water Act, as it pertains to wetlands</td>
<td>To Be Considered</td>
<td>Prohibits discharge of dredged or fill material into wetlands adjacent to navigable waters without a permit.</td>
<td>NA</td>
</tr>
<tr>
<td>Location-Specific</td>
<td>Executive Order 11990 Protection of Wetlands</td>
<td>To Be Considered</td>
<td>Requires federal agencies to provide leadership and take action to minimize the destruction, loss, or degradation of wetlands, and to preserve and enhance the natural and beneficial values of wetlands.</td>
<td>NA</td>
</tr>
<tr>
<td>Location-Specific</td>
<td>Endangered Species Act (16 USC 1531 et seq.)</td>
<td>Applicable</td>
<td>Requires that action be performed to conserve endangered species or threatened species.</td>
<td>NA</td>
</tr>
<tr>
<td>ARAR Type</td>
<td>Requirement</td>
<td>Status</td>
<td>Summary of Requirement</td>
<td>Groundwater Remedy Alternatives</td>
</tr>
<tr>
<td>-----------------</td>
<td>-----------------------------------------------------------------------------</td>
<td>-----------------------</td>
<td>----------------------------------------------------------------------------------------</td>
<td>---------------------------------</td>
</tr>
<tr>
<td>Location-Specific</td>
<td>New Jersey Endangered Plant Species Program (N.J.A.C 7:5C)</td>
<td>Relevant and Appropriate</td>
<td>Identifies the official list of endangered plant species and establishes the program for maintaining and updating the list.</td>
<td>NA</td>
</tr>
<tr>
<td>Location-Specific</td>
<td>New Jersey Division of Fish, Game, and Wildlife Rules (N.J.A.C 7:25)</td>
<td>Relevant and Appropriate</td>
<td>Supplements the statutes governing fish and game laws in the State of New Jersey.</td>
<td>WBCW WBCW</td>
</tr>
<tr>
<td>Location-Specific</td>
<td>National Wildlife Refuge System Administration Act of 1968, as amended by the National Wildlife Refuge System Improvement Act of 1997</td>
<td>Applicable</td>
<td>This act and amendments governs the use and management of National Wildlife Refuges.</td>
<td>WBCW</td>
</tr>
<tr>
<td>Location-Specific</td>
<td>Final Comprehensive Conservation Plan, Great Swamp National Wildlife Refuge, November 2014</td>
<td>To Be Considered</td>
<td>This plan present the management goals, objectives, and strategies that guide the management of the Great Swamp National Wildlife Refuge over the next 15 years.</td>
<td>WBCW</td>
</tr>
<tr>
<td>Location-Specific</td>
<td>Wilderness Act of 1964 (16 USC 1131-1136)</td>
<td>Applicable</td>
<td>This act directs each agency administering designated wilderness to preserve the “wilderness character” of areas within the Nation Wilderness Preservation System (NWPS) and to administer the NWPS for the *use and enjoyment of the American people in a way that will leave those areas unimpaired to fur use and enjoyment as Wilderness.</td>
<td>WBCW</td>
</tr>
<tr>
<td>Location-Specific</td>
<td>Great Swamp Wilderness Act of 1968 (Public Law 90-532, September 28, 1968)</td>
<td>Applicable</td>
<td>Designates the eastern portion of the refuge, comprised of 3,660 acres, as the Wilderness Area.</td>
<td>WBCW</td>
</tr>
<tr>
<td>Location-Specific</td>
<td>Refuge Recreation Act of 1962 (16 USC 460K-460K-4)</td>
<td>Applicable</td>
<td>Assures present or future recreational uses by the public on areas within national wildlife refuges.</td>
<td>WBCW</td>
</tr>
</tbody>
</table>
Table 7-2
Summary of Compliance to Applicable, Relevant or Appropriate Requirements (ARARs) for Groundwater Alternatives
Rolling Knolls Landfill Superfund Site - Feasibility Study
Chatham, New Jersey

<table>
<thead>
<tr>
<th>ARAR Type</th>
<th>Requirement</th>
<th>Status</th>
<th>Summary of Requirement</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Location-Specific</td>
<td>Floodplain Management and Wetlands Protection (40 CFR 6.302(a) and (b); 40 CFR 6, Appendix A)</td>
<td>Applicable</td>
<td>Requires agencies to perform certain measures to avoid the long and short term impacts associated with the destruction or modification of wetlands and floodplains.</td>
<td>NA</td>
<td>WBCW</td>
<td>WBCW</td>
</tr>
<tr>
<td>Location-Specific</td>
<td>Federal Noxious Weed Act of 1974 (PL 93-629; 7 USC 2801, et seq)</td>
<td>Applicable</td>
<td>Requires the use of integrated management systems to control or contain undesirable plant species.</td>
<td>NA</td>
<td>WBCW</td>
<td>WBCW</td>
</tr>
<tr>
<td>Location-Specific</td>
<td>Executive Order 13112. Management of Invasive Species</td>
<td>To Be Considered</td>
<td>Requires that federal agencies take certain actions to prevent introduction of invasive species and provide for their control.</td>
<td>NA</td>
<td>WBCW</td>
<td>WBCW</td>
</tr>
<tr>
<td>Location-Specific</td>
<td>Fish and Wildlife Coordination Act (16 USC 661 et seq)</td>
<td>Applicable</td>
<td>Requires actions to protect fish or wildlife when diverting, channeling, or modifying a stream.</td>
<td>NA</td>
<td>WBCW</td>
<td>WBCW</td>
</tr>
<tr>
<td>Location-Specific</td>
<td>Fish and Wildlife Coordination Act Advisories.</td>
<td>To Be Considered</td>
<td>Advisories on the effects of pollutants and other activities on wildlife, including migratory birds and fish, and wildlife habitat authorized under the Fish and Wildlife Coordination Act.</td>
<td>NA</td>
<td>WBCW</td>
<td>WBCW</td>
</tr>
</tbody>
</table>

Notes
1. Alternative Description:
   - Alternative 1 - No Action
   - Alternative 2 - Source Control and Monitoring
   - Alternative 3 - Source Control and Monitoring with Contingent Remedy
2. WBCW - Will be complied with. Pursuant to the ARAR, applicable standards and regulations will be complied with during remedial design and actions.
3. NA - Not Applicable. The ARAR is not relevant to the alternative remedial actions and therefore not applicable for evaluation of compliance of the alternative to the ARAR.
### Table 7-3: Construction Cost Estimate for Groundwater Alternative No. 2

**Source Control and Monitoring**  
Rolling Knolls Landfill Superfund Site - Feasibility Study  
Chatham Township, New Jersey

<table>
<thead>
<tr>
<th>Component</th>
<th>Range Unit Cost ($)</th>
<th>Unit</th>
<th>Quantity</th>
<th>Common Site Construction Cost ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A - Design/Construction Oversight/Permits</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre-Design Investigation</td>
<td>8</td>
<td>%</td>
<td>111,600</td>
<td>10,100</td>
</tr>
<tr>
<td>Remedial Design</td>
<td>8</td>
<td>%</td>
<td>111,600</td>
<td>10,100</td>
</tr>
<tr>
<td>Remedial Oversight</td>
<td>10</td>
<td>%</td>
<td>111,600</td>
<td>14,000</td>
</tr>
<tr>
<td>Permits</td>
<td>-</td>
<td></td>
<td>Not Provided</td>
<td></td>
</tr>
<tr>
<td><strong>Subtotal</strong></td>
<td></td>
<td></td>
<td></td>
<td>34,200</td>
</tr>
<tr>
<td><strong>B - Construction Preparation</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bonding, insurance etc.</td>
<td>0.1</td>
<td>%</td>
<td>111,600</td>
<td>200</td>
</tr>
<tr>
<td>Mobilization/Demobilization</td>
<td>1</td>
<td>%</td>
<td>111,600</td>
<td>3,400</td>
</tr>
<tr>
<td><strong>Subtotal</strong></td>
<td></td>
<td></td>
<td></td>
<td>3,600</td>
</tr>
<tr>
<td><strong>C - Well Installation and Abandonment</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Project Management</td>
<td>7,500</td>
<td></td>
<td></td>
<td>2,250</td>
</tr>
<tr>
<td>Field Oversight</td>
<td>15,000</td>
<td></td>
<td></td>
<td>20,000</td>
</tr>
<tr>
<td>Post-Installation Deliverables (Figures, Form Rs, etc.)</td>
<td>5,000</td>
<td></td>
<td></td>
<td>6,300</td>
</tr>
<tr>
<td>Waste Classification Sampling and Analysis</td>
<td>2,600</td>
<td></td>
<td></td>
<td>3,100</td>
</tr>
<tr>
<td>Waste Management and Disposal</td>
<td>2,700</td>
<td></td>
<td></td>
<td>3,200</td>
</tr>
<tr>
<td>Drilling Services (up to 10 shallow monitoring wells)</td>
<td>35,000</td>
<td></td>
<td></td>
<td>40,000</td>
</tr>
<tr>
<td>Geophysical Services</td>
<td>2,000</td>
<td></td>
<td></td>
<td>7,500</td>
</tr>
<tr>
<td>Surveying Services</td>
<td>2,000</td>
<td></td>
<td></td>
<td>9,000</td>
</tr>
<tr>
<td><strong>Subtotal</strong></td>
<td></td>
<td></td>
<td></td>
<td>111,600</td>
</tr>
<tr>
<td><strong>D - Post-Remedy Operation &amp; Maintenance</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sampling groundwater network</td>
<td>60,000</td>
<td></td>
<td></td>
<td>1,080,000</td>
</tr>
<tr>
<td><strong>Subtotal</strong></td>
<td></td>
<td></td>
<td></td>
<td>1,080,000</td>
</tr>
<tr>
<td><strong>E - Site Controls (administrative)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reporting to EPA</td>
<td>4,000</td>
<td>every 5-yrs</td>
<td>6</td>
<td>24,000</td>
</tr>
<tr>
<td>NJ Remedial Action Permit Application</td>
<td>2,000</td>
<td>each</td>
<td>1</td>
<td>2,000</td>
</tr>
<tr>
<td>NJ Remedial Action Permit Annual Fee</td>
<td>700</td>
<td>average over 30 years</td>
<td>30</td>
<td>21,000</td>
</tr>
<tr>
<td>NJ Classified Exception Area/Well Restriction Area</td>
<td>8,000</td>
<td>est.</td>
<td>1</td>
<td>8,000</td>
</tr>
<tr>
<td>Reporting to NJ</td>
<td>4,000</td>
<td>every 2-yrs</td>
<td>15</td>
<td>60,000</td>
</tr>
<tr>
<td><strong>Subtotal</strong></td>
<td></td>
<td></td>
<td></td>
<td>115,000</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td></td>
<td></td>
<td></td>
<td>1,345,000</td>
</tr>
</tbody>
</table>

**Note:**

1. The cost for the source control portion of this alternative has been included in Soil Alternatives 3 through 6. This cost estimate includes monitoring and institutional controls only.
2. See Table 7-4 for cost estimate assumptions, notes, and limitations.
<table>
<thead>
<tr>
<th></th>
<th>Estimated Quantities</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>In many cases the areas or volumes have been assumed. The estimated quantities (e.g., length, areas, or volumes) that have been used in the development of the cost estimates should be verified before construction. It is assumed that the work will be done in Level D personnel protective equipment (PPE) and by non-union labor.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Unit Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.</td>
<td>The estimated unit costs are based on Geosyntec's experience and published information such as RSMeans. The costs that have been developed should be considered only as a relative guide. A range of unit costs have been applied to an item with high variabilities.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Groundwater Treatment Area and Thickness</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.</td>
<td>Groundwater treatment is intended to address impacts present in well MW-3 and in well MW-10 above the NJDEP Ground Water Quality Standards. One area will be treated by enhanced in-situ biodegradation and the other will be treated by chemical oxidation. Each area is assumed to be 0.5 acres (total of 1 acre) with a saturated thickness of 10 feet below the water table for the purpose of this cost estimate.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Monitoring Well Installation and Abandonment</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.</td>
<td>It is assumed that 10 monitoring wells will be installed around MW-3 and MW-10 and across the landfill to supplement the existing monitoring well network. These wells will be shallow, up to 20 feet below ground surface. One existing monitoring well will be abandoned due to damage and reinsatlled with the same construction specifications.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Schedule</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.</td>
<td>It is assumed that groundwater monitoring will be implemented after soil remediation and source control are complete.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Well Restriction</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.</td>
<td>New Jersey regulation (NJAC 7:9D-2.3[a]) prohibits installation of potable wells with casings less than 50 feet in depth. It is expected that the existing non-potable supply well will be decommissioned.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Source Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.</td>
<td>The cost for the source control portion of Groundwater Alternatives 2 and 3 is included in the costs for Soil Alternatives 3 through 6. This is because the proposed source control will be implemented at the same time, and will use the same technologies, as the soil remedy. If Soil Alternatives 1 or 2 are selected, a separate source control cost will be developed.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Contingency Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>8.</td>
<td>The cost estimates do not include contingency costs (e.g., handling of unforeseen liquid or hazardous wastes found in drums or other containers, delays due to weather, etc).</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>New Jersey Licensed Site Remediation Professional (LSRP)</th>
</tr>
</thead>
<tbody>
<tr>
<td>9.</td>
<td>The opinion of an LSRP may be required during remedy implementation; these costs have not been included.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Post-Remedy Operation and Maintenance</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.</td>
<td>30 years of operations and maintenance for groundwater monitoring were assumed. The groundwater sampling schedule was assumed to be: annual for the first 4 years, biennial for the next 4 years, and octennial starting at Year 8 and onward. This schedule is consistent with NJDEP guidance and equates to 12 sampling events over a 30-year period.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Site Controls (administrative)</th>
</tr>
</thead>
<tbody>
<tr>
<td>11.</td>
<td>The annual fee for the Remedial Action Permit for Groundwater is assumed to increase at a rate of 5% per year.</td>
</tr>
</tbody>
</table>
## Table 7-5: Construction Cost Estimate for Groundwater Alternative No. 3
**Source Control and Monitoring with Contingent Remedy**
Rolling Knolls Landfill Superfund Site - Feasibility Study
Chatham Township, New Jersey

<table>
<thead>
<tr>
<th>Component</th>
<th>Range Unit Cost ($)</th>
<th>Unit</th>
<th>Quantity</th>
<th>Common Site Construction Cost ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A - Design/Construction Oversight/Permits</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre-Design Investigation</td>
<td>8</td>
<td>10</td>
<td>% Construction</td>
<td>1,198,200</td>
</tr>
<tr>
<td>Remedial Oversight</td>
<td>8</td>
<td>10</td>
<td>% Construction</td>
<td>1,198,200</td>
</tr>
<tr>
<td>Permits</td>
<td>-</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Subtotal</strong></td>
<td></td>
<td></td>
<td></td>
<td>365,600</td>
</tr>
<tr>
<td><strong>B - Construction Preparation</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bonding, insurance etc.</td>
<td>0.1</td>
<td>0.2</td>
<td>% Construction</td>
<td>1,198,200</td>
</tr>
<tr>
<td>Mobilization/Demobilization</td>
<td>1.5</td>
<td>7.5</td>
<td>% Construction</td>
<td>1,198,200</td>
</tr>
<tr>
<td><strong>Subtotal</strong></td>
<td></td>
<td></td>
<td></td>
<td>55,800</td>
</tr>
<tr>
<td><strong>C - Well Installation and Abandonment</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Project Management</td>
<td>7,500</td>
<td>15,000</td>
<td>per mth</td>
<td>2</td>
</tr>
<tr>
<td>Field Oversight</td>
<td>15,000</td>
<td>25,000</td>
<td>each</td>
<td>1</td>
</tr>
<tr>
<td>Waste Classification Sampling and Analysis</td>
<td>2,600</td>
<td>3,600</td>
<td>each event</td>
<td>1</td>
</tr>
<tr>
<td>Waste Management and Disposal</td>
<td>2,700</td>
<td>3,700</td>
<td>each event</td>
<td>1</td>
</tr>
<tr>
<td>Drilling Services (up to 10 shallow monitoring wells)</td>
<td>35,000</td>
<td>45,000</td>
<td>lump sum</td>
<td>1</td>
</tr>
<tr>
<td>Geophysical Services</td>
<td>2,000</td>
<td>3,000</td>
<td>each event</td>
<td>3</td>
</tr>
<tr>
<td>Surveying Services</td>
<td>2,000</td>
<td>4,000</td>
<td>day</td>
<td>3</td>
</tr>
<tr>
<td><strong>Subtotal</strong></td>
<td></td>
<td></td>
<td></td>
<td>111,600</td>
</tr>
<tr>
<td><strong>D - Enhanced Biodegradation Groundwater Remedy</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Project Management</td>
<td>7,500</td>
<td>15,000</td>
<td>per mth</td>
<td>2</td>
</tr>
<tr>
<td>Baseline Groundwater Sampling and Analysis</td>
<td>12,000</td>
<td>17,000</td>
<td>lump sum</td>
<td>1</td>
</tr>
<tr>
<td>Field Oversight</td>
<td>24,000</td>
<td>33,000</td>
<td>each</td>
<td>1.5</td>
</tr>
<tr>
<td>Geophysical Services</td>
<td>2,000</td>
<td>3,000</td>
<td>each event</td>
<td>0.5</td>
</tr>
<tr>
<td>Surveying Services</td>
<td>2,000</td>
<td>4,000</td>
<td>day</td>
<td>0.5</td>
</tr>
<tr>
<td>Waste Classification Sampling and Analysis</td>
<td>2,600</td>
<td>3,600</td>
<td>each event</td>
<td>0.5</td>
</tr>
<tr>
<td>Waste Management and Disposal</td>
<td>2,700</td>
<td>3,700</td>
<td>each event</td>
<td>0.5</td>
</tr>
<tr>
<td><strong>Subtotal</strong></td>
<td></td>
<td></td>
<td></td>
<td>235,800</td>
</tr>
<tr>
<td><strong>E - In-Situ Chemical Oxidation Groundwater Remedy</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Project Management</td>
<td>7,500</td>
<td>15,000</td>
<td>per mth</td>
<td>2</td>
</tr>
<tr>
<td>Baseline Groundwater Sampling and Analysis</td>
<td>12,000</td>
<td>17,000</td>
<td>lump sum</td>
<td>1</td>
</tr>
<tr>
<td>Field Oversight</td>
<td>24,000</td>
<td>33,000</td>
<td>each</td>
<td>1.5</td>
</tr>
<tr>
<td>Injection Work</td>
<td>300,000</td>
<td>720,000</td>
<td>each</td>
<td>1.5</td>
</tr>
<tr>
<td>Geophysical Services</td>
<td>2,000</td>
<td>3,000</td>
<td>each event</td>
<td>0.5</td>
</tr>
<tr>
<td>Surveying Services</td>
<td>2,000</td>
<td>4,000</td>
<td>day</td>
<td>0.5</td>
</tr>
<tr>
<td>Waste Classification Sampling and Analysis</td>
<td>2,600</td>
<td>3,600</td>
<td>each event</td>
<td>0.5</td>
</tr>
<tr>
<td>Waste Management and Disposal</td>
<td>2,700</td>
<td>3,700</td>
<td>each event</td>
<td>0.5</td>
</tr>
<tr>
<td><strong>Subtotal</strong></td>
<td></td>
<td></td>
<td></td>
<td>850,800</td>
</tr>
<tr>
<td><strong>F - Post-Remedy Operation &amp; Maintenance</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sampling groundwater network</td>
<td>60,000</td>
<td>120,000</td>
<td>each event</td>
<td>12</td>
</tr>
<tr>
<td><strong>Subtotal</strong></td>
<td></td>
<td></td>
<td></td>
<td>1,080,000</td>
</tr>
<tr>
<td><strong>G - Site Controls (administrative)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reporting to EPA</td>
<td>4,000</td>
<td>every 5 yrs</td>
<td>6</td>
<td>24,000</td>
</tr>
<tr>
<td>NJ Remedial Action Permit Application</td>
<td>2,000</td>
<td>each</td>
<td>1</td>
<td>2,000</td>
</tr>
<tr>
<td>NJ Remedial Action Permit Annual Fee</td>
<td>700</td>
<td>average over 30 yrs</td>
<td>30</td>
<td>21,000</td>
</tr>
<tr>
<td>NJ Classified Exception Area/Well Restriction Area</td>
<td>8,000</td>
<td>est.</td>
<td>1</td>
<td>8,000</td>
</tr>
<tr>
<td>Reporting to NJ</td>
<td>4,000</td>
<td>every 2 yrs</td>
<td>15</td>
<td>60,000</td>
</tr>
<tr>
<td><strong>Subtotal</strong></td>
<td></td>
<td></td>
<td></td>
<td>115,000</td>
</tr>
</tbody>
</table>

**TOTAL** 2,815,000

**Note:**
(1) The cost for the source control portion of this alternative has been included in Soil Alternatives 3 through 6. This cost estimate includes monitoring, institutional controls, and the contingent remedy (assumed to include enhanced biological degradation and in-situ chemical oxidation) only.
# Table 7-6: Summary of Remedial Construction Cost Estimates
Rolling Knolls Landfill Superfund Site - Feasibility Study
Chatham Township, New Jersey

<table>
<thead>
<tr>
<th>Component</th>
<th>Alternative No. 1 No Action</th>
<th>Alternative No. 2 Source Control and Monitoring¹</th>
<th>Alternative No. 3 Source Control and Monitoring with a Contingent Remedy¹</th>
</tr>
</thead>
<tbody>
<tr>
<td>Design/Construction Oversight/Permits</td>
<td>$0</td>
<td>$34,200</td>
<td>$365,600</td>
</tr>
<tr>
<td>Construction Preparation</td>
<td>$0</td>
<td>$3,600</td>
<td>$55,800</td>
</tr>
<tr>
<td>Well Installation and Abandonment</td>
<td>$0</td>
<td>$111,600</td>
<td>$111,600</td>
</tr>
<tr>
<td>Enhanced Biodegradation Groundwater Remedy</td>
<td>$0</td>
<td>$0</td>
<td>$235,800</td>
</tr>
<tr>
<td>In-Situ Chemical Oxidation Groundwater Remedy</td>
<td>$0</td>
<td>$0</td>
<td>$850,800</td>
</tr>
<tr>
<td>Post-Remedy Operation &amp; Maintenance</td>
<td>$0</td>
<td>$1,080,000</td>
<td>$1,080,000</td>
</tr>
<tr>
<td>Site Controls (administrative)</td>
<td>$0</td>
<td>$115,000</td>
<td>$115,000</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$0</strong></td>
<td><strong>$1,345,000</strong></td>
<td><strong>$2,815,000</strong></td>
</tr>
</tbody>
</table>

**Notes**

(1) The cost for the source control portion of Groundwater Alternatives 2 and 3 is included in the costs for Soil Alternatives 3 through 6. This is because the proposed source control will be implemented at the same time as the soil remedy and will use the same technologies as the soil remedy. If Soil Alternatives 1 or 2 are selected, a separate source control cost will be developed.

(2) All costs are in 2018 dollars with the exception of Post-Remedy Operation & Maintenance (O&M) costs, which assumes 2.5% annual inflation over 30 years for landfill and groundwater O&M.

(3) See Tables 7-3 and 7-5 for details of cost estimates.

(4) See Table 7-4 for cost estimate assumptions, notes, and limitations.