

TABLE X
SUMMARY OF CONCEPTUAL REMEDIAL ALTERNATIVES
MILL ROCK PARK AND ROCHFORD FIELD
HAMDEN, CONNECTICUT

Remedial Alternatives for Mill Rock Park & Rochford Field ⁽¹⁾⁽²⁾⁽³⁾		Advantages	Disadvantages	Opinion of Probable Costs for Mill Rock Park and Rochford Field Combined ⁽⁴⁾⁽⁵⁾	Approximate Construction Duration ⁽⁶⁾
Alternative 1 – Complete Excavation & Vegetative Cap	<p>Alternative 1A: On-site excavation and off-site landfill disposal or recycling of all soil exceeding RSR criteria, replacement of excavated material with clean fill and natural dilution and attenuation groundwater monitoring.</p> <p>Alternative 1B: On-site excavation and off-site disposal at the Hamden Middle School site of all soil exceeding RSR criteria, replacement of excavated material with clean fill and natural dilution and attenuation groundwater monitoring.</p>	<p>Both Alternatives:</p> <ul style="list-style-type: none"> ■ Complete removal of contaminated soil exceeding RSR criteria ■ Achieves compliance with RDEC and PMC ■ Risk of exposure to future site users minimal ■ Allows continued recreational use of site ■ No limits on future site use ■ Application for Widespread Polluted Fill Variance or Alternative PMC and Groundwater Reclassification not required ■ Long term monitoring only required until groundwater compliance achieved <p>Alternative 1A:</p> <ul style="list-style-type: none"> ■ No risk of exposure to public during disposal <p>Alternative 1B:</p> <ul style="list-style-type: none"> ■ No disposal facility costs ■ Lower transportation costs for disposal than Alternative 1A ■ Less transportation-related issues than Alternative 1A 	<p>Both Alternatives:</p> <ul style="list-style-type: none"> ■ Most expensive alternative ■ Significant potential exposure risk to workers and residents during excavation (such as inhalation and ingestion from dust emissions, and noise pollution) ■ Transportation of material presents risk of releases ■ Truck traffic creates noise, air pollution and potential for injury ■ Clean fill would need to be imported to the site to offset the volume of material being disposed of off site. ■ Presence of waste material in deeper fill increases disposal cost ■ Extensive confirmatory and characterization soil sampling required ■ Potential for children to access work areas containing deep water-filled excavations ■ Groundwater dewatering required <p>Alternative 1A:</p> <ul style="list-style-type: none"> ■ Higher transportation and disposal costs than Alternative 1B <p>Alternative 1B:</p> <ul style="list-style-type: none"> ■ Potential exposure risk to workers and public during disposal, stockpiling and capping at Hamden Middle School 	<p>Alternative 1A: \$18.5 – \$27.5 Million</p> <p>Alternative 1B: \$5.2 - \$7.8 Million</p>	<p>Alternative 1A: 6 Months</p> <p>Alternative 1B: 5 Months</p>
Alternative 2 – Excavation to 4 ft Depth and Vegetative Cap	<p>Alternative 2A: On-site excavation to a depth of 4 ft. below grade and off-site landfill disposal and/or recycling of soil exceeding RSR criteria, replacement of excavated material with clean fill, ELUR, Alternative PMC or Application for Widespread Polluted Fill Variance, Groundwater Reclassification and natural dilution and attenuation groundwater monitoring.</p> <p>Alternative 2B: On-site excavation to a depth of 4 ft. below grade and off-site disposal of soil exceeding RSR criteria at the Hamden Middle School site, replacement of excavated material with clean fill, ELUR, Alternative PMC or Application for Widespread Polluted Fill Variance, Groundwater Reclassification and natural dilution and attenuation groundwater monitoring.</p>	<p>Both Alternatives:</p> <ul style="list-style-type: none"> ■ Less expensive than removal of all material exceeding RDEC and PMC (Alternatives 1) ■ Achieves compliance with RDEC and PMC ■ Reclassification of groundwater would allow soil data to be compared to less stringent GB PMC ■ GWPC would not apply ■ Confirmatory soil sampling not required ■ Dewatering not required <p>Alternative 2A:</p> <ul style="list-style-type: none"> ■ Less risk of exposure to workers and public by eliminating stockpiling and placement activities at the Hamden Middle School site <p>Alternative 2B:</p> <ul style="list-style-type: none"> ■ No disposal facility costs ■ Lower transportation costs for disposal than Alternative 1A ■ Less transportation-related issues than Alternative 1A 	<p>Both Alternatives:</p> <ul style="list-style-type: none"> ■ Long-term monitoring required ■ Future disruptions must follow ELUR – additional costs and potential risks to human health ■ Requires CTDEP approval of alternative criteria for PMC or Application for Widespread Polluted Fill Variance ■ Requires CTDEP approval of alternative GW Classification ■ Potential exposure risk to workers and residents during excavation (such as inhalation and ingestion from dust emissions, and noise pollution) ■ Transportation of material presents risk of releases ■ Truck traffic creates noise, air pollution and potential for injury ■ Clean fill would need to be imported to the site to offset the volume of material being disposed of off site. ■ Presence of waste material in fill increases disposal cost ■ ELUR required <p>Alternative 2A:</p> <ul style="list-style-type: none"> ■ Higher transportation and disposal costs than Alternative 2B ■ Characterization soil sampling required for off-site disposal <p>Alternative 2B:</p> <ul style="list-style-type: none"> ■ Potential exposure risk to workers and public during disposal, stockpiling and capping at Hamden Middle School 	<p>Alternative 2A: \$9.2 – \$13.8 Million</p> <p>Alternative 2B: \$3.2 - \$4.8 Million</p>	<p>Alternative 2A: 5 Months</p> <p>Alternative 2B: 4 Months</p>

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Remedial Alternatives for Mill Rock Park & Rochford Field ⁽¹⁾⁽²⁾⁽³⁾	Advantages	Disadvantages	Opinion of Probable Costs for Mill Rock Park and Rochford Field Combined ⁽⁴⁾⁽⁵⁾	Approximate Construction Duration ⁽⁶⁾
<p style="writing-mode: vertical-rl; transform: rotate(180deg);">Alternative 3 – Excavation to 2 ft Depth and Asphalt Cap</p> <p>Alternative 3A: On-site excavation to a depth of 2 ft. below grade and off-site landfill disposal or recycling, replacement of excavated material with clean fill, placement of an asphalt cap, ELUR, Alternative PMC or Application for Widespread Polluted Fill Variance, Groundwater Reclassification and natural dilution and attenuation groundwater monitoring.</p> <p>Alternative 3B: On-site excavation to a depth of 2 ft. below grade and off-site disposal at the Hamden Middle School site, replacement of excavated material with clean fill, placement of an asphalt cap, ELUR, Alternative PMC or Application for Widespread Polluted Fill Variance, Groundwater Reclassification and natural dilution and attenuation groundwater monitoring.</p>	<p>Both Alternatives:</p> <ul style="list-style-type: none"> ■ Less expensive than removal of all material exceeding RDEC and PMC (Alternative 1) ■ Less expensive than removal of all material to 4 ft. depth (Alternative 2) ■ Less soil removal reduces duration of exposure risk to workers and public during excavation, reduces risk of releases during transportation, and reduces duration of noise, air pollution and potential for injury associated with transportation ■ Achieves compliance with RDEC and PMC ■ Reclassification of groundwater would allow soil data to be compared with less stringent GB PMC ■ GWPC would not apply ■ Confirmatory soil sampling not required ■ Dewatering not required ■ Most excavated material would be acceptable for landfill cover <p>Alternative 3A:</p> <ul style="list-style-type: none"> ■ Less risk of exposure to workers and public by eliminating stockpiling and placement activities at the Hamden Middle School site <p>Alternative 3B:</p> <ul style="list-style-type: none"> ■ No disposal facility costs ■ Lower transportation costs for disposal than Alternative 1A ■ Less transportation-related issues than Alternative 1A 	<p>Both Alternatives:</p> <ul style="list-style-type: none"> ■ Long-term monitoring required ■ Future disruptions must follow ELUR – additional costs and potential risks to human health ■ Requires CTDEP approval of alternative criteria for PMC or Application for Widespread Polluted Fill Variance ■ Requires CTDEP approval of alternative GW Classification ■ Potential exposure risk to workers and residents during excavation (such as inhalation and ingestion from dust emissions, and noise pollution) ■ Transportation of material presents risk of releases ■ Truck traffic creates noise, air pollution and potential for injury ■ Clean fill would need to be imported to the site to offset the volume of material being disposed of off site. ■ Paved surface requires installation of storm drains, additional storm water management facilities to control additional surface water runoff ■ Paved surfaces must be routinely inspected for cracks and damage and immediately repaired ■ Social impacts to the neighborhood from loss of green space and associated recreational activities (i.e., baseball and soccer fields) ■ Characterization soil sampling required for off-site disposal ■ ELUR required <p>Alternative 3A:</p> <ul style="list-style-type: none"> ■ Higher transportation and disposal costs than Alternative 3B <p>Alternative 3B:</p> <ul style="list-style-type: none"> ■ Potential exposure risk to workers and public during disposal, stockpiling and capping at Hamden Middle School 	<p>Alternative 3A: \$8.5 – \$12.7 Million</p> <p>Alternative 3B: \$3.2 - \$4.8 Million</p>	<p>Alternative 3A: 4 Months</p> <p>Alternative 3B: 3 Months</p>

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Remedial Alternatives for Mill Rock Park & Rochford Field ⁽¹⁾⁽²⁾⁽³⁾		Advantages	Disadvantages	Opinion of Probable Costs for Mill Rock Park and Rochford Field Combined ⁽⁴⁾⁽⁵⁾	Approximate Construction Duration ⁽⁶⁾
Alternative 4 – Engineered Cap of Waste Materials with Vegetative Cover	Alternative 4: Installation of Engineered Control, ELUR and natural dilution and attenuation groundwater monitoring	<ul style="list-style-type: none"> ■ Least expensive Alternative, but accomplishes goal of protection of health and the environment ■ No off-site soil removal: minimizes risk of releases during transportation, and reduces duration of noise, air pollution and potential for injury associated with transportation ■ Minimizes duration of exposure risk to workers and public during construction ■ Minimal imported materials which reduces costs for material purchase and transportation and reduces duration of noise, air pollution, and potential for injury associated with transportation. ■ Achieves compliance with RDEC and PMC ■ GWPC would not apply ■ Confirmatory and characterization soil sampling not required ■ Shortest time to complete ■ Dewatering not required 	<ul style="list-style-type: none"> ■ Long-term monitoring and maintenance of cap required ■ Future disruptions must follow ELUR – additional costs to be born by Town for disturbances ■ Additional costs related to protection against worker and public exposure risks in the event cap is disturbed in the future ■ Cap requires installation of storm drains, additional storm water management facilities to control additional surface water runoff ■ ELUR required ■ Future site development restricted and expensive 	\$ 2.7 - \$4.0 Million	2 Months

Notes

1. Remedial Alternatives assume no remedial work at the Sewer Pump Station.
2. Per CTDEP, Option “B” (i.e., disposal of waste material at the Hamden Middle School site) must be considered as part of the Remedial Alternatives Assessment. However, other no-cost alternatives may be identified after further evaluation and consideration by all parties involved and affected.
3. GWPC will be addressed by groundwater reclassification and/or natural dilution and attenuation groundwater monitoring. SWPC will be addressed through natural dilution and attenuation monitoring or demonstration of point of compliance monitoring (i.e., monitoring of groundwater at down gradient locations prior to groundwater discharge to a surface water).
4. Opinions of Probable Costs do not include cost for obtaining CTDEP RSR variances, alternative criteria or ELURs. Opinion of Probable Costs does include cost to restore existing recreational uses (i.e., playground equipment, ball field equipment, bleachers, etc.)
5. Pursuant to Section B.1.b and c of the Consent Order, the Town of Hamden shall pay for the investigation and remediation of Mill Rock Park and the State of Connecticut is to fund the investigation and remediation of Rochford Field. However, for the purposes of this remedial alternatives assessment, these costs have been combined.
6. Construction Duration does not include the time required to obtain CTDEP RSR variances, alternative criteria, ELURs or approval of remedial design.