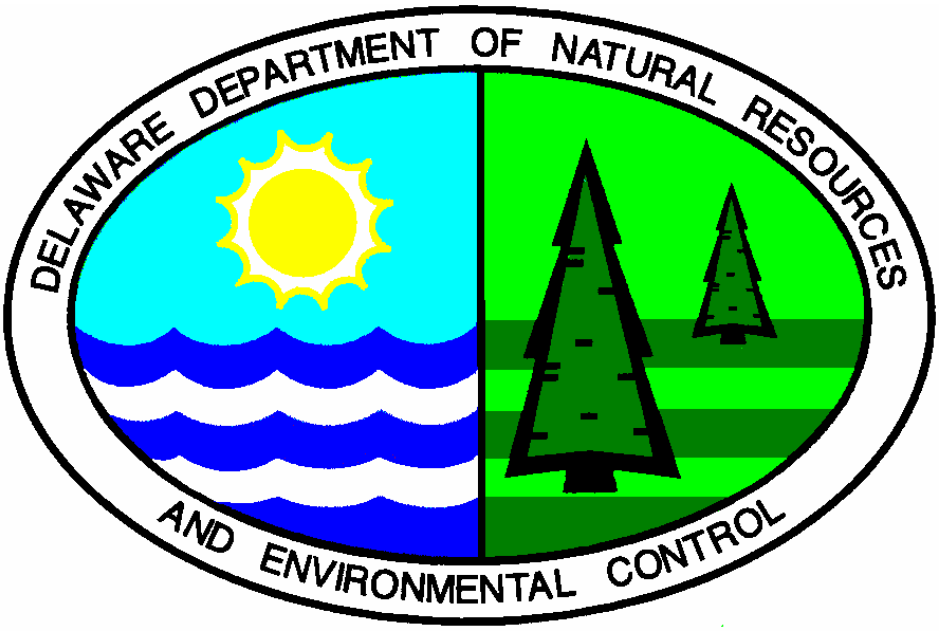
AMENDED PROPOSED PLAN

FOR THE

Fox Point Park (II) Site
Operable Unit 1

Wilmington, Delaware



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DNREC Project DE-1011

Prepared by:
Delaware Department of Natural Resources & Environmental Control
Division of Air and Waste Management
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1.0 INTRODUCTION AND SUMMARY

In 1996, the Department of Natural Resources and Environmental Control (DNREC) signed a Consent Decree with three parties concerning the Fox Point Park II site. The parties, known as potentially responsible parties or PRPs, were American Premier Underwriters, Incorporated, New Castle County and the City of Wilmington. The PRPs agreed to perform a Remedial Investigation and Feasibility Study (RI/FS) of the site. The *Hazardous Substance Cleanup Act*, 7 Del. C., Chapter 91, known as HSCA, grants DNREC the authority to enter in to such agreements to address concerns raised by the presence of chemical contamination on land in Delaware.

The PRPs retained NES, Inc. of Danbury, Connecticut to perform the work specified in the Consent Decree. NES reported its findings to DNREC in a series of reports in 1998.

Based on the RI/FS reports, DNREC issued a proposed plan of remedial action (proposed plan) which specified the remedial alternative for the cleanup of the site. The proposed plan was issued for public comment in September 1999. The proposed plan discussed the findings, risk assessment and proposed remedies in detail. At the request of the City of Wilmington and New Castle County, DNREC extended the usual 20-day public comment period. No comments from the public were received, but the PRPs met with DNREC several times to discuss the proposed remedy and submitted written comments. At the request of the PRPs, DNREC delayed issuing the final plan of remedial action (final plan). Because of the delays involved in the project, the Department has decided to issue an amended proposed plan of remedial action (amended proposed plan), which modifies the remedial action for the site that was contained in the original 1999 proposed plan.

Some of the changes to the original proposed plan were in response to comments made by the PRPs in a letter dated February 23, 2000. The PRPs were concerned that the proposed plan did not address the Delaware River. The elements of the original proposed plan (a clean soil cover, enclosing the drainage ditches in culverts, and fencing along the riverbank) will remain the same. However, the amended proposed plan will only pertain to Operable Unit 1 of the site, which includes the surface soil, drainage ditches and human health risks on the Delaware River bank. The Department will seek a separate agreement with the responsible parties to investigate the impact of the site on the Delaware River as Operable Unit 2.

Although the site is not open to the public, the results of the risk assessment indicate that surface soil contamination presents an unacceptable risk to trespassers based on certain exposure assumptions. There would also be unacceptable risks to visitors if the site were used as a park in its present condition. Sediments in the drainage ditches on the site are contaminated. The Department is therefore proposing to protect the public health and welfare and the environment by covering the surface soil with a layer of clean material, fencing along the riverbank and isolating drainage across the site by enclosing the ditches in culverts.

2.0 SITE DESCRIPTION AND HISTORY

The site is approximately 45 acres located north of Wilmington in northern New Castle County as shown on Figures 1 and 2. The site is bounded on the east by the Delaware River and on the west by a railroad right-of-way and Route 495. The site may be accessed by way of Lighthouse Road, which intersects with Edgemoor Road at the DuPont Edgemoor Plant.

The site is divided into four parcels by drainage ditches. The drainage ditches carry runoff from the I-495 right-of-way and the railroad to the Delaware River. The ditches have been designated AB, BC, CD, and D creating four distinct parcels on the site known as parcels A, B, C and D. Parcels A and B (Fox Point I) have been remediated and are open to the public as Fox Point Park. Ditch AB was enclosed in a culvert as part of the remediation. Figure 3 shows the existing park as Fox Point I and the present study area (parcels C and D) as Fox Point II. Figure 4 shows features of Fox Point II.

Other than the drainage ditches, which have steep sides, the site is relatively flat. At the river's edge, there is a steep slope of about eight to ten feet down to a narrow mud beach.

The surface soil of the site is stable sludge material from 6 inches to one foot in depth. Vegetation consists of tall grasses, brush and small trees.

The site occupies an area of "filled land" adjacent to the Delaware River. In an agreement dated August 15, 1940, the Engineers Department of the United States Army granted the Pennsylvania Railroad permission to deposit excavated material from the channel of the Delaware River upon land belonging to the railroad. The Pennsylvania Railroad began filling in the property in the 1960s with industrial waste materials including slag, bricks, timbers, waste ingots, castings and ash furnace dust, eventually raising the surface of the site to approximately 10 feet above the natural elevation.

The State of Delaware acquired the property for New Castle County in 1975. New Castle County Parks & Recreation operated and maintained the park until it was transferred back to the State in 1990. In 1976, the City of Wilmington, with the permission of the New Castle Department of Public Works, began applying sewage sludge from its treatment plant to the site as a soil amendment in an effort to improve the vegetative cover. Records show that at least 2,378 dry tons of sludge was applied to Parcel C and 9,670 dry tons to Parcel D.

In 1990, the DNREC Division of Parks and Recreation, in response to a long standing desire of the local community, developed plans to utilize the site as a public park. An environmental assessment of the property revealed elevated levels of arsenic and polyclorinated biphenyls (PCBs) in the surface soils. The DNREC Division of Air and Waste Management became involved and Parcels A and B, comprising about 15 acres, were remediated under HSCA.

The remediation effort at Fox Point I consisted of capping or covering the surface with an impermeable membrane and clean soil. Ditch AB was routed through a culvert and the ground surface above it was leveled. A fence was constructed along the riverfront and along two other drainage ditches to restrict access to contaminated sediments. Site remediation and park development were performed under the joint supervision of the two Divisions and financed from

public funds including the HSCA fund. The park is now in operation. There is currently no public access to Parcels C and D.

With the completion of Fox Point I, DNREC initiated a second phase to address suspected contamination on Parcels C and D. Unlike Fox Point I, this stage of the project has been implemented through the enforcement authority of DNREC under HSCA.

3.0. REMEDIAL INVESTIGATION

Previous Investigations

The investigation of environmental conditions at the site actually began in 1975 with monitoring during the initial application of sewage sludge. Samples taken from the sludge material had elevated concentrations of heavy metals including arsenic (up to 150 parts per million) and lead (up to 2,500 parts per million). In 1986, Duffield Associates performed an environmental assessment of the site for New Castle County. The assessment noted the presence of contamination and recommended covering the site with clean fill material.

DNREC conducted its own investigation in 1991 and found contaminants including arsenic, lead and PCBs at significant levels in surface soils. The area was then closed to the public.

In 1992, Camp Dresser and McKee, Inc. (CDM) performed a remedial investigation and risk assessment of Parcels A and B. Arsenic, lead and PCBs were identified as contaminants of concern. This investigation led to the remediation of parcels A and B.

NES Remedial Investigation

The remedial investigation (RI) of Parcels C and D performed by NES, Inc. included extensive sampling of soil, subsurface soil, sediment, surface water and ground water at the site. Forty-one surface soil locations were sampled. Five ground water monitoring wells and twelve soil borings were placed on the site. Two surface water samples were taken from each of the two ditches on the site. Ten sediment samples were taken from the ditches and riverbank. Samples from all media were analyzed for volatile organic compounds, semi-volatile organic compounds, pesticides, PCBs, and inorganics (metals) by NET Laboratories of Thoroughfare, New Jersey. Additionally, soil samples from 132 surface locations were analyzed for PCBs and polynuclear aromatic hydrocarbons (PAHs) by immunoassay methods.

Based on the results of sampling and the history of the site, the sources of the contamination are the applied sewage sludge and the industrial wastes used as fill material. Soil, ground water, surface water and sediment sample results were compared to risk based screening levels and 16 chemicals were identified as “contaminants of potential concern” (COPCs). They are: arsenic, cadmium, chromium, lead, manganese, thallium, zinc, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, dibenz(a,h)anthracene, bis(2-ethylhexyl)phthalate, di-n-butylphthalate, Aldrin, Dieldrin and total PCBs. However, not all contaminants are present in all four media. The RI report includes complete compilations of the sampling data. The contaminants associated with the greatest potential human health and environmental risks are listed in the tables below.

Soil

Table 1: Surface Soil Sample Results

Analyte	Units	Frequency of Detection	Maximum	Mean	95% UCL[1]
Arsenic	mg/kg	41/41	112	38.7	45
Cadmium		38/41	137	8.6	23
Chromium		41/41	3815	823	888
Lead		41/41	32990	1233	1518
Manganese		41/41	5538	1295	1362
Thallium		18/41	1.49	0.42	1.07
Zinc		41/41	120,900	4463	5012
Benzo(a)anthracene	µg/kg	35/41	9580	731	870
Benzo(a)pyrene		36/41	8560	737	867
Benzo(B)fluoranthene		38/41	9580	831	962
Dibenz(a,h,)anthracene		6/41	229	541	653
Bis(2-ethylhexyl)phthalate		40/41	77600	3080	3517
di-n-butylphthalate		14/41	928	517	630
Aldrin		1/41	5.3	5	9.7
Dieldrin		13/41	513	36.6	64.6
Total PCBs		31/41	14368	2390	2501

1. The 95% upper confidence level of the mean is a calculated value used in risk assessment as representative of the concentration of the contaminant on the site.

Groundwater

Groundwater sample results were compared to standards for drinking water. Contaminants exceeding screening concentrations are tabulated below.

Table 2: Groundwater Sample Results (ug/l)

	Frequency of detection	Maximum	Mean	Uniform Risk-based Standard[1]
Bis(2-ethylhexyl)Phthalate	4/5	79	34.3	5
Pentachlorophenol	1/5	12	12	0.6
Arsenic	5/5	75	40	0.50

1. Remediation Standards Guidance under the Delaware Hazardous Substance Cleanup Act, 1999

Five pesticide compounds were also found in groundwater but the concentrations were well below relevant screening levels and they were not widely distributed.

Sediment

Two sediment samples were taken from each of the ditches. Six were taken along the Delaware River bank. Results from samples taken in ditch BC for the investigation of Parcels A and B are included in the table below.

Table 3: Sediment Sample Results

		Ditch BC[1]		Ditch CD		Ditch D		Delaware River		URS[2]
	units	*mean*	*max*	*mean*	*max*	*mean*	*max*	*mean*	*max*	
Total PCBs	ug/kg	42	64	541	709	142	184	224	583	*
Arsenic	mg/kg	2.7	4.5	9.4	14.4	22.2	29.8	14.9	26.1	8
Barium	mg/kg	61	64	115	148	146	182	95	225	20
Copper	mg/kg	140	200	406	748	1248	1327	1518	6986	34
Lead	mg/kg	106	137	107	109	533	757	413	911	47
Manganese	mg/kg	486	762	1429	2394	5296	9581	3307	11040	*
Nickel	mg/kg	47	81	253	480	350	560	305	1020	21
Selenium	mg/kg	1	7.2	5	7	5	7	2.75	8.74	*
Vanadium	mg/kg	23	33	41	47	172	313	105	305	*
Zinc	mg/kg	235	236	311	431	1765	3219	1509	3856	150

1. Results for Ditch BC are from the Remedial Investigation/Feasibility Study performed by **CDM** for DNREC in 1992.
2. Uniform Risk Based Standard (Protection of the Environment) for Sediment from Remediation Standards Guidance under the Delaware Hazardous Substance Cleanup Act, 1999
3. * Not available.

Surface Water

The drainage ditches on the site are under tidal influence. The four surface water samples were taken at low tide from stagnant pools of water. Both filtered and unfiltered samples were analyzed for inorganics. The pools were not turbid and there was little difference in the results of filtered and unfiltered samples. Organic contaminants in surface water include bis(2-Ethylhexyl)Phthalate, Dieldrin, Endrin ketone and gamma-Chlordane. The presence of these compounds in site soils suggests that they are related to the site rather than an upstream source. The highest levels of organic contaminants appear at the upstream sampling location of Ditch CD. The contaminant concentrations for both organic and inorganic substances are below available screening levels.

4.0 RESULTS OF THE HUMAN HEALTH RISK ASSESSMENT

A risk assessment was performed by NES, Inc. to evaluate potential risks associated with current and future uses of the site. The assessment addressed risks of cancer and of non-cancer health effects separately. Populations evaluated included the child park visitor, adult park visitor, grounds keeper and construction worker. Of these, the child park visitor is the most sensitive receptor.

The Department set the parameters for the risk assessment and determined that a 2-hour visit to the park once a week would be a reasonably conservative estimate of potential exposure to the contaminated area. If the site were used as a park in its current condition, the child visitor would have an additional cancer risk of .000014 or 1.4 in 100,000. The additional risk is principally from dermal contact with and ingestion of soil contaminated with arsenic. Under the

Regulations Governing Hazardous Substance Cleanup (Regulations), this additional cancer risk is unacceptable. The non-cancer health effects to the child, however, would be negligible.

The risk assessment also evaluated the potential risks to a construction worker involved with development of the site into a park. For this exposure scenario, the worker would be on the site for 8-hours a day for 109 days spread over one year. Incidental ingestion of soil, dermal contact with soil and inhalation of dust are the possible pathways of exposure to the construction worker. The risk assessment concludes that the additional cancer risk to the construction worker in this case would be 3.6 in 1,000,000, which is acceptable under the Regulations. The non-cancer health effects to the construction worker would be an unacceptable risk due mainly to the incidental ingestion of soil contaminated with lead, arsenic and chromium.

5.0 ECOLOGICAL RISK ASSESSMENT

A supplemental report to the Human Health Risk Assessment evaluated the potential effect of contamination on aquatic habitats at the site. The evaluation began with the screening of maximum and average concentrations of chemicals in sediments against published benchmark values. A further weight-of-evidence evaluation that considered the frequency of detection, toxicological properties and physical-chemical characteristics of the chemicals was performed. Nine substances were identified as potentially impacting the aquatic habitat: total PCBs, barium, copper, lead, manganese, nickel, selenium, vanadium and zinc.

The Risk Assessment prepared by consultants to the responsible parties concludes that there is only a small potential for effects in a localized area to aquatic life and that other populations (raccoon, river otters, clapper rails and red-winged blackbirds) are not likely to be affected. However, the Department disagreed with this conclusion and determined that contamination in ditch sediments and the potential for migration of contaminants via the ditches should be addressed.

The relatively low level of contamination in the site groundwater suggests that any potential impact on the Delaware River water quality due to discharge of groundwater is negligible. However, this will be addressed in more detail as part of OU2.

6.0 REMEDIAL ACTION OBJECTIVES OF OPERABLE UNIT 1

The Division of Parks and Recreation has long had the goal of using the Fox Point Park site as a State park. The development of Parcels A and B as the current State Park has proven a popular destination even though it is rather small and has limited amenities. The main point of interest at the present Fox Point Park, as it would be for the expanded park, is its riverfront location. The next closest place where there is public access to the Delaware River is at Battery Park in New Castle, approximately 10 miles away. The expansion of the park to parcels C and D would provide additional riverfront space for a variety of active and passive recreational activities. Proposals for the area have included an ice skating rink, activity areas, a boat ramp and marina. Remediation of Parcels C & D will permit an eventual connection greenway connection between Bellevue and Fox Point State Parks.

The current conditions of contamination in soil and sediment on Parcels C and D make the area unsuitable for use as a park unless the area is remediated.

The concentrations of contamination in groundwater are infrequent or below screening levels. The site is not suitable as a public water supply area because of the proximity of the Delaware River. The objectives for Operable Unit 1 therefore do not include remediation of ground water.

The objectives of the remedial action will be to restore the site to usability as a public park and mitigate the effects of site sediment contaminants on the environment. In order to do this, the chemical hazards must be reduced to acceptable levels. As defined in the Regulations, these are (1) an additional cancer risk of no more than 1 in 100,000 (in a park use exposure scenario) and (2) a measure of non-cancerous health risks no greater than a "hazard index" of one. The human health objectives would be met if the average arsenic in surface soils were reduced from a present level of 40 mg/kg to 11 mg/kg. (An arsenic concentration of 11 mg/kg of soil is the typical average concentration in commercially available clean fill.) Clean fill material would also be free from elevated levels of other site contaminants including PCBs, chromium, and lead that contribute to current risk at the site.

The objectives regarding sediment in the ditches are to isolate surface drainage that crosses the site from contaminated sediment and from the contaminated fill material. Note that remedial objectives related to the contaminated sediments in the Delaware River will be addressed in Operable Unit 2.

7.0 EVALUATION OF POTENTIAL REMEDIAL ALTERNATIVES

Soils

Remedial Action Screening

Under the Regulations, evaluating potential remedial options involves an initial screening for (1) protectiveness of public health, welfare and the environment; (2) acceptable engineering practices including applicability, feasibility and reliability, and; (3) relative cost.

General response actions for soil contamination at hazardous waste sites include:

1. No Action
2. Containment
3. Treatment

The **No Action** option at Fox Point would involve leaving the surface of the site as it is but with minimal institutional controls to be maintained in the future. This option would be not protective of public health if the site were used as a park. It is therefore eliminated from further consideration.

Containment options include various techniques, which cover or cap the contaminated soils but involve no treatment to reduce the concentrations of contaminants in them. Containment, with appropriate institutional controls, would be protective in that it would eliminate human contact with soils having elevated arsenic concentrations. Containment would be applicable and feasible at this site and is an established engineering practice. Containment techniques differ in their reliability. Various forms of containment will be considered in further screening.

The third category—**Treatment**—includes a wide variety of *ex situ* techniques and a few *in situ* techniques:

Excavation and off-site disposal or treatment: This approach would be protective of the public health and the environment. However, excavation and off-site disposal or treatment has not been generally applied at similar sites because contamination is relatively dilute in a large volume of soil material. The estimated volume to be excavated (and replaced) is approximately 850,000 cubic yards. The excavation and replacement of this volume of material is not considered feasible; it is therefore not considered further.

In situ treatment Some techniques are available to treat contaminated soils in place. For organic contamination (such as PAHs and PCBs) biotreatment consists of enhancing bacterial action in the soil that breaks down contaminants into less toxic compounds. This approach has been most successfully applied at sites affected by petroleum contamination. It does not apply to metal contamination and would therefore have to be combined with another treatment technique for the lead and arsenic present in soils. A relatively new form of treatment known as "phytoremediation" has been successfully used on a limited scale to remediate metal contamination in soils. The technique uses plants selected specifically for their ability to take up heavy metals from the soils. The plants are able to concentrate metals in their stems and leaves, thus reducing concentrations in soils. Phytoremediation has not been shown to be effective for arsenic on a large scale. Since arsenic in soils cause most of the risk involved in exposure at the site, phytoremediation is not considered applicable.

Further Evaluation

After screening remedial approaches to soil contamination at the site, only the *containment* option appears to be protective, applicable, feasible and reliable. Several forms of containment will be considered in more detail. According to the HSCA Regulations, after the initial screening is performed, an evaluation shall be conducted of the remaining alternative using the following eleven criteria:

1. Protectiveness
2. Compliance with all applicable local, state, and federal laws and regulations
3. Community acceptance
4. Provision for monitoring the success of the alternative
5. Technical feasibility
6. Ability to be implemented
7. Practicability from a cost standpoint
8. A reasonable restoration time frame
9. Reduction of toxicity, mobility and volume
10. Long term effectiveness
11. Short term effectiveness.

Four alternative types of caps and covers were retained for consideration in more detail. Common to all of them is the interruption of the exposure pathway by placing material between the contamination and park visitors. The four alternatives are described below. A comparison of the alternatives (designated Soil-A to Soil-D) with the 11 criteria above is described in Table 4.

Soil-A Soil mixing

This alternative would reduce the concentration of toxic substances in the site surface soils. The existing vegetative cover would be cleared and removed. A layer of clean topsoil of 6 to 12 inches would be applied to the site surface and disked into the existing soil cover. Although this alternative would not eliminate contact with the contaminants, risks would be reduced to acceptable levels because the concentration of contaminants that park visitors are exposed to would be reduced. The addition of topsoil could be expected to improve the condition of the site soil so that the vegetative cover would be well supported.

Soil-B Clean fill and top soil

This alternative consists of the removal and disposal of the existing site vegetative cover and placement of clean fill material and a 4-inch topsoil layer on the 37.5-acre site. The quantities of fill material would be dictated by the proposed park grades. The new fill and topsoil would reduce risk by isolating the contaminants from employees and visitors. Typical fill material and topsoil found in Delaware has an arsenic concentration averaging about 11 mg/Kg. A vegetative cover would be maintained to control erosion of the cover. Four inches of topsoil is considered the minimum topsoil cover to support a robust community of turf grasses.

Soil-C Permeable fabric and clean fill

This alternative would involve removal of the existing vegetative cover as above and installation of a synthetic filter fabric, clean fill and a 4-inch topsoil layer on the site. As in alternative B. the thickness of the layer of clean fill would be determined by the park grades. The permeable fabric layer would result in containment of the contaminants below the liner and would prevent direct human contact with contaminated soils. The liner would server as a marker between the clean soil cover and the contaminated soil. However, some controls would have to be instituted to maintain the integrity of the liner. Any plants utilized on the site would be shallow rooted to avoid damage to the permeable liner.

Soil-D Impermeable liner and clean fill

For this alternative, site vegetation would be removed as above. A layer of sand approximately 6 inches deep would be placed on the surface of the site. An impermeable liner similar to the type of liner used in sanitary landfills would cover the sand layer. The liner would be seamed watertight and topped with clean fill and topsoil. The impermeable liner would prevent not only contact between park visitors and contaminated soils, but also percolation of precipitation through the contaminated soil. Drainage would be collected in a perimeter drain system with an appropriately sized retention pond.

Parcels A and B (Fox Point I) were remediated with an impermeable liner and clean fill system. Since construction there have been several problems with drainage on the site and with support of vegetation on the soil cover.

Sediment

The remedial approaches available to achieve goals related to contaminated sediment are similar to those discussed for soil—no action, containment and removal/treatment. DNREC has also considered a role for engineering controls. However, the actual means of implementing containment would differ from the soil capping and covering discussed above since the ditches are still required to convey drainage across the site.

The **No Action** option for sediments at Fox Point would leave the ditches and riverbank in their current condition. Contamination from the site would continue to enter the ditches and move from the ditches to the Delaware River. This would not meet the remedial objectives.

Engineering controls would consist of fencing off areas of contaminated sediment. Fencing would not be protective of the environment because water flow in the ditches would continue to erode contaminated fill material and carry it to the Delaware River. However, fencing along the riverbank would reduce human exposure to contaminated sediments there and is consistent with future use as a park. Fencing the riverbank does not reduce the environmental effects of contaminated sediment in the Delaware River, but this potential problem will be addressed in Operable Unit 2.

Containment of the contaminated sediment in the drainage ditches would prevent any human exposure and isolate drainage in the ditches from contaminated fill. In this context, containment would mean separating drainage from the contaminated sediments by directing the ditches through culverts. Containment of drainage in culverts meets the remedial objectives for Operable Unit 1 and is retained for further screening.

Table 4: Comparison of Remedial Alternatives for Site Soils

HSCA Criteria	*Alternative Soil-A.* Soil mixing	*Alternative Soil-B.* Clean fill and top soil	*Alternative Soil-C.* Permeable fabric and clean fill	*Alternative Soil-D.* Impermeable liner and clean fill
Protectiveness	Meets minimum requirement for protectiveness	Protective	Protective	Protective
Compliance with applicable requirements	Compliant	Compliant	Compliant	Compliant
Community Acceptance	Acceptability is questionable	Potentially acceptable	Potentially acceptable	Acceptability by future groundskeepers is problematical
Monitoring	Required	Required	Required	Routine monitoring not needed
Feasibility	Feasible	Feasible	Feasible	Feasible
Implementation	Easiest implementation	Implement able	Implement able but significantly more difficult than *B.*	Implement able but additional design and construction for water drainage.
Capital Cost [1]	1,900,000	$2,363,172	$2,844,096	$8,422,149
Time Frame	Reasonable	Reasonable	Reasonable	Reasonable
Reduction of toxicity, mobility and volume	Minimal reduction in mobility, no reduction in toxicity or volume, achieves quantitative goals by dilution	Some reduction in mobility, no reduction in toxicity or volume	Reduction in mobility greater than *B*, but no reduction in toxicity or volume	Significant reduction in mobility, no reduction in toxicity or volume
Long term effectiveness	Effective	Potential for damage caused by surface or intrusive activities but easily maintained	Potential for damage caused by surface or intrusive activities	Potential for damage caused by surface or intrusive activities, difficult to maintain
Short term effectiveness	Effective	Effective	Effective	Effective

[1] Cost estimate for Alternative- Soil A is by DNREC-Soil A is by DNREC-DIRB. Other cost estimates are by NES, Inc.

The **Removal** option would consist of digging out contaminated sediment from the drainage ditches for disposal on or off the site. Removal of contaminated sediment alone does not meet the minimum screening criteria of the Regulations because it would not be reliable. That is, without additional containment of the sides of the ditches, the ditch sediment would become re-contaminated.

The site remediation will include:

1. Removal of contaminated sediment from the ditches to the extent necessary to create a bed for culverts.

2. Construction of culverts to convey drainage from off site areas across the site and prevent erosion.

Table 5: Ditch Sediment Remediation

HSCA Criteria	Sediment plan—containment in culverts, limited removal
Protectiveness	Fully protective of human health. Reduces but does not eliminate contaminated sediment in the Delaware River.
Compliance with applicable requirements	Regulatory requirements and permits including wetlands permits may apply, but the sediment plan is potentially compliant.
Community Acceptance	Acceptance is expected. There were no public comments on a similar approach to sediments in Fox Point I.
Monitoring	Monitoring and periodic maintenance will be needed.
Feasibility	Feasible and uses accepted engineering practices.
Implementation	Implementable
Cost	$600,000 (DNREC estimate based on costs of remedial action for Parcels A and B)
Time Frame	Can be completed in a reasonable period.
Reduction of toxicity, mobility and volume	Significant reduction in mobility of contaminants. No appreciable reduction in toxicity or volume.
Long term effectiveness	Effective
Short term effectiveness	Effective

8.0 INTERIM ACTION

With the voluntary cooperation of a private construction contractor, DNREC arranged to bring approximately 60,000 cubic yards of clean fill material from the Delaware Olds Site to Fox Point II at reduced cost. The material has been placed and graded on the site consistent with this proposed plan of remedial action and the proposed park development plan. This activity has achieved a savings of approximately $500,000 in the final cost of the remediation. Additional clean fill material will be acquired if it becomes available under similar circumstances.

9.0 AMENDED PROPOSED PLAN

The Department's proposed plan for Operable Unit 1 of Fox Point II is similar to that constructed on the southern parcel, Fox Point I. The remedial action for Fox Point I included a cap over contaminated soil, fencing along the river bank and constructing a culvert for a drainage ditch. A significant difference between remedial action on the two phases is that the current proposal is for a clean soil cover (*Alternative Soil-B)* rather than an impermeable cover. Experience with the impermeable cover at Fox Point I shows that it is not compatible with typical park landscaping and that it creates a drainage problem. Alternative Soil-B will result in an acceptable level of protection and meets the other regulatory criteria.

In summation, the elements of the proposed plan of remedial action for Fox Point II Operable Unit 1 are:

- A clean soil cover extending over the contaminated surface of parcels C and D that will be accessible to the public through the park entrance when the property is open as a park;

- New culverts to isolate drainage ditches BC, CD and D from contaminated sediments and subsurface soil. Culverts will be covered and brought to grade with clean fill; and,

- A fence along the river bank which, with appropriate park rules, will reduce exposure of park visitors to contaminated sediment in or along the Delaware River.

The remediation will include an Operations and Maintenance Plan (O & M) to cover notification and procedures for excavation on the property.

10.0 PUBLIC PARTICIPATION

DNREC actively solicits public comments or suggestions on the amended proposed plan of remedial action and welcomes opportunities to answer questions. Please direct written comments to:

DNREC Site Investigation and Restoration Branch
391 Lukens Drive
New Castle, Delaware 19720
Attention: Stephen F. Johnson, PE

The public comment period begins on October 22, 2003 and will end on November 12, 2003.

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John Blevins, Director Division of Air and Waste Management	Date