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REMEDIAL INVESTIGATION/
FEASIBILITY STUDY REPORT

VOLUME IV
APPENDICES

MILLCREEK SITE
ERIE COUNTY, PENNSYLVANIA

EPA WORK ASSIGNMENT
NUMBER 60-3L60
CONTRACT NUMBER 68-01-6699

NUS PROJECT NUMBER S778

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SUBMITTED FOR NUS BY:

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APPENDIX K

GROUNDWATER EXTRACTION AND TREATMENT

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APPENDIX K

GROUNDWATER EXTRACTION AND TREATMENT

K.1 Groundwater Extraction and Treatment

Data gathered during the Remedial Investigation at the Millcreek Site indicate that on and offsite contamination of groundwater has occurred. Control of this contaminated groundwater may be accomplished by pumping the water to the surface and treating the recovered liquids for release or reinjection. Groundwater extraction and treatment will achieve the following objectives:

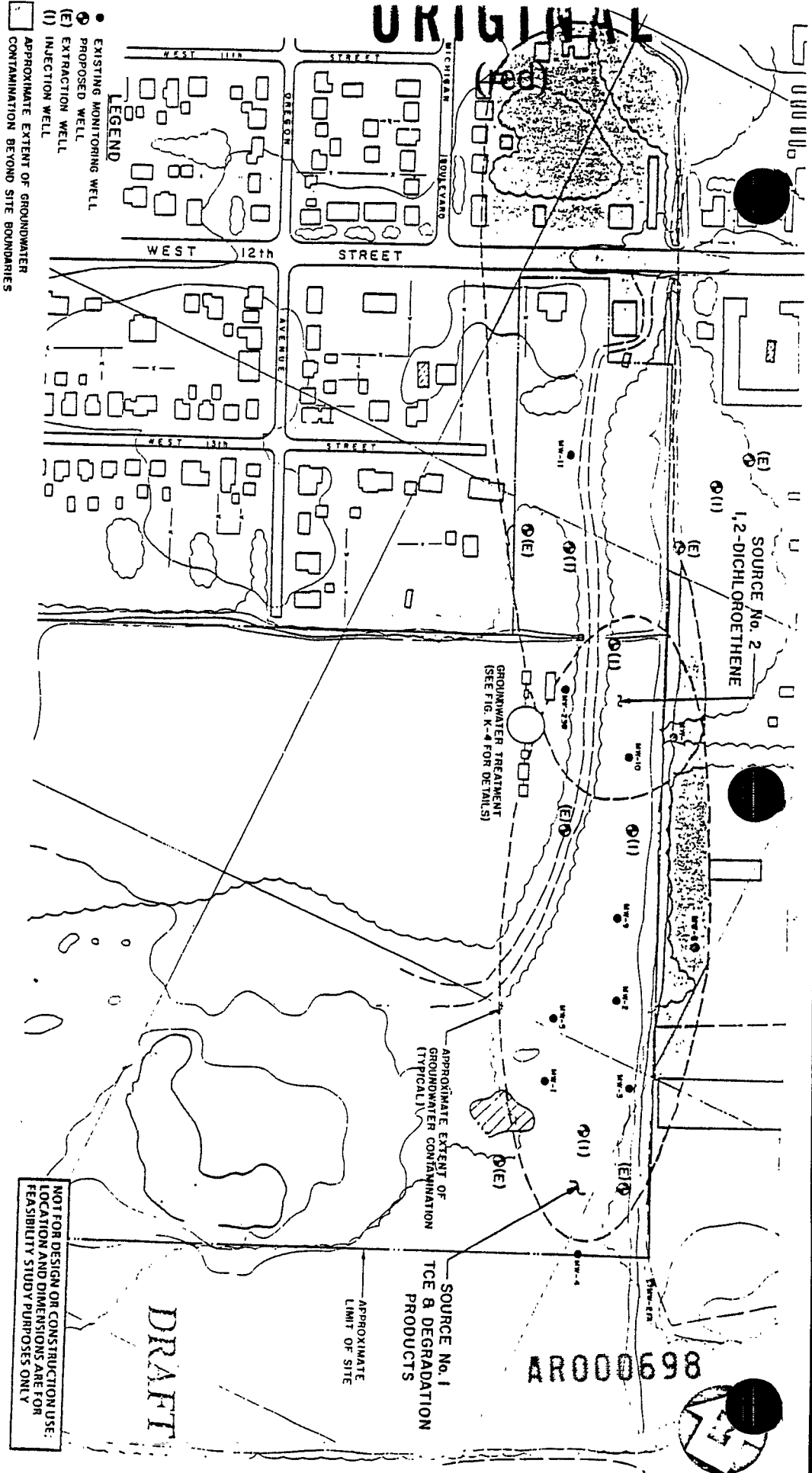
- Control of flow or influences of plume flow.
- Prevent further contaminant migration off site. (See Figure K-1 for current plume.)
- Control of toxic groundwater contaminants using treatment system specific to the quality desired.
- Protection of nearby surface waters by retarding the rate at which groundwater recharges Marshall's Run.

A series of extraction and injection wells can be used to lift groundwater to the surface, where it can be treated using physical, chemical, or biological methods. Treated effluent may either be released to an offsite POTW for further treatment, released to Marshall's Run, or injected into the aquifer from which it was pumped.

Careful monitoring of pumped groundwater is necessary to assure that the plume is extracted to the surface in an effective manner. In particular, the impact of reinjection must be determined early to make certain that the plume is not diverted away from the recovery wells. The groundwater collection and treatment system designed for Millcreek will be described in detail in the following sections.

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- LEGEND**
- EXISTING MONITORING WELL
 - ⊕ PROPOSED WELL
 - (E) EXTRACTION WELL
 - (I) INJECTION WELL
 - APPROXIMATE EXTENT OF GROUNDWATER CONTAMINATION BEYOND SITE BOUNDARIES

**GROUNDWATER RECOVERY SYSTEM
MILL CREEK SITE, MILL CREEK TWP., PA**

SCALE: 1" = 200'



K-2

FIGURE K-1



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K.2 Groundwater Recovery System

K.2.1 General

The groundwater extraction system was designed to recover the contaminated groundwater from the sand, silt, and gravel aquifer beneath the Millcreek Site. Aquifer characteristics were reported in the RI Report prepared by NUS Corporation.

The groundwater extraction system was designed with the assistance of BESTWELLS, a computer optimization model designed by In-Situ, Inc. The model determines the optimum number and location of wells to achieve a targeted drawdown. Injection wells purge the low-flow velocity regions between wells so that stagnant contamination could be removed.

BESTWELLS is a steady-state, analytical model with the following built-in assumptions:

- The aquifer is of uniform thickness.
- The aquifer is infinite in extent.
- The properties of the aquifer are homogeneous and constant.
- All wells are fully screened and 100 percent efficient.
- The pumping rate of the well remains constant during the lifetime of the project; i.e., the pumping rate of the well represents the average pumping rate for the given pumping period.
- The groundwater head is constant at the boundary of the project area.

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Since site conditions at Millcreek can be characterized by the model assumption, BESTWELLS is a useful tool in estimating the location and production rate of the proposed groundwater extraction system.

K.2.2 System Operation

The groundwater extraction system was designed based on the following input data obtained during the Remedial Investigation:

- Well diameter - 4 inches
- Maximum available drawdown - 15 feet
- Pumping duration - 6 months
- Aquifer type - unconfined
- Existing water table elevation - 708.1 feet above MSL
- Hydraulic conductivity - 17.8 gpd/ft²
- Specific yield - 0.15
- Target drawdown - 15 feet
- Physical boundary of well field - see Figure K-1
- Location of contaminated plume - see Figure K-1
- Thickness of contaminated plume - 15 feet
- Plume volume - 1.7 x 10⁶ cubic feet.

The purpose of applying BESTWELLS is to determine the optimum number and location of wells to recover the contaminant plume. In other words, the model is used to design a well field to lower the water table 15 feet below current elevation. Twelve existing wells were used in the well field design to lower construction costs. Additionally, the sand, silt, and gravel media in the aquifer must be flushed at least once during the pumping period.

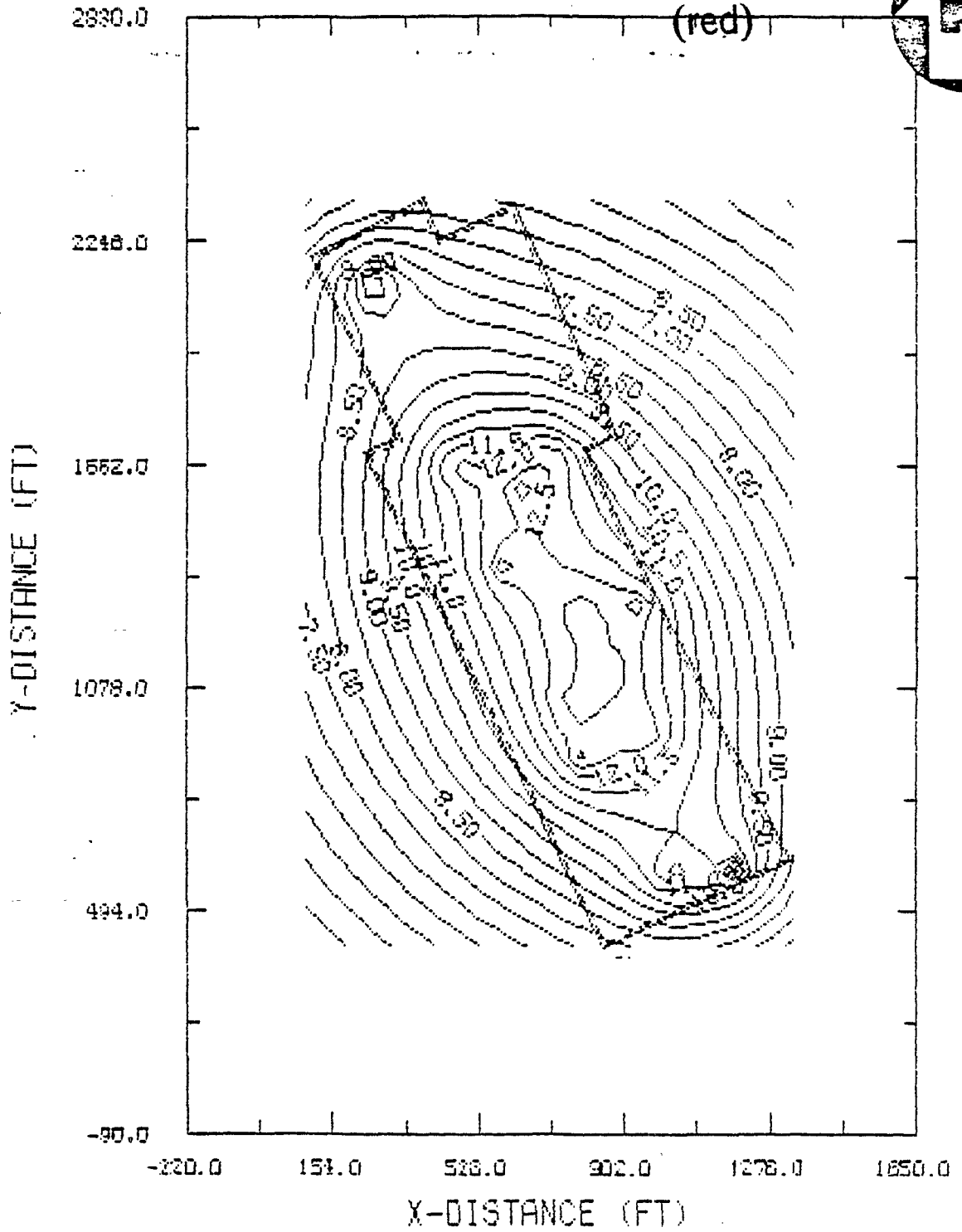
K.2.3 Model Output

The model indicates that using 12 existing and 6 new wells, at an associated pumping rate of 500 gpm, will lower the water table by 12 feet (see Figure K-2).

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PUMPING DRAWDOWN CONTOURS
MILLCREEK SITE, MILLCREEK TWP, PA

K-5



However, to achieve complete recovery of groundwater contaminants, five recharge wells were added. These wells are located where the drawdown gradient was relatively flat. The injection rate for each recharge well is designed at 30 gpm. This injection rate is based on the average pumping rate of the 18 extraction wells. The total pumping rate of 18 extraction wells and five recharge wells is 585 gpm. Approximately 150 gpm will be treated and injected into the aquifer. The net discharge rate will be 435 gpm or 1 cfs.

The drawdown contours from the combined pumping and recharge system indicated the average drawdown is approximately identical to the 18 extraction well system (see Figure K-3). However, the stagnant areas between the extraction wells are significantly reduced by the mixing that is obtained through injection. Based on the production rate of 585 gpm obtained by the pumping and recharge system, the amount of water pumped during the 6-month period is $2.0 \times 10^{-7} \text{ ft}^3$, or 12 pore volumes.

During design of the groundwater recovery system, consideration was given to the Yoder Wells, located about 2,000 feet south of the site. The drawdown contours indicate that the cone of depression may extend to the Yoder Wells. The maximum induced drawdown is approximately 1 foot, attained at the end of the 6-month pumping period. This effect will be reduced by the natural recovery that occurs when pumping operations at the site cease. During normal rainfall times, the induced drawdown is not expected to have an effect on the Yoder Wells' capacity. However, there is a possibility that during dry conditions there may be some effect.

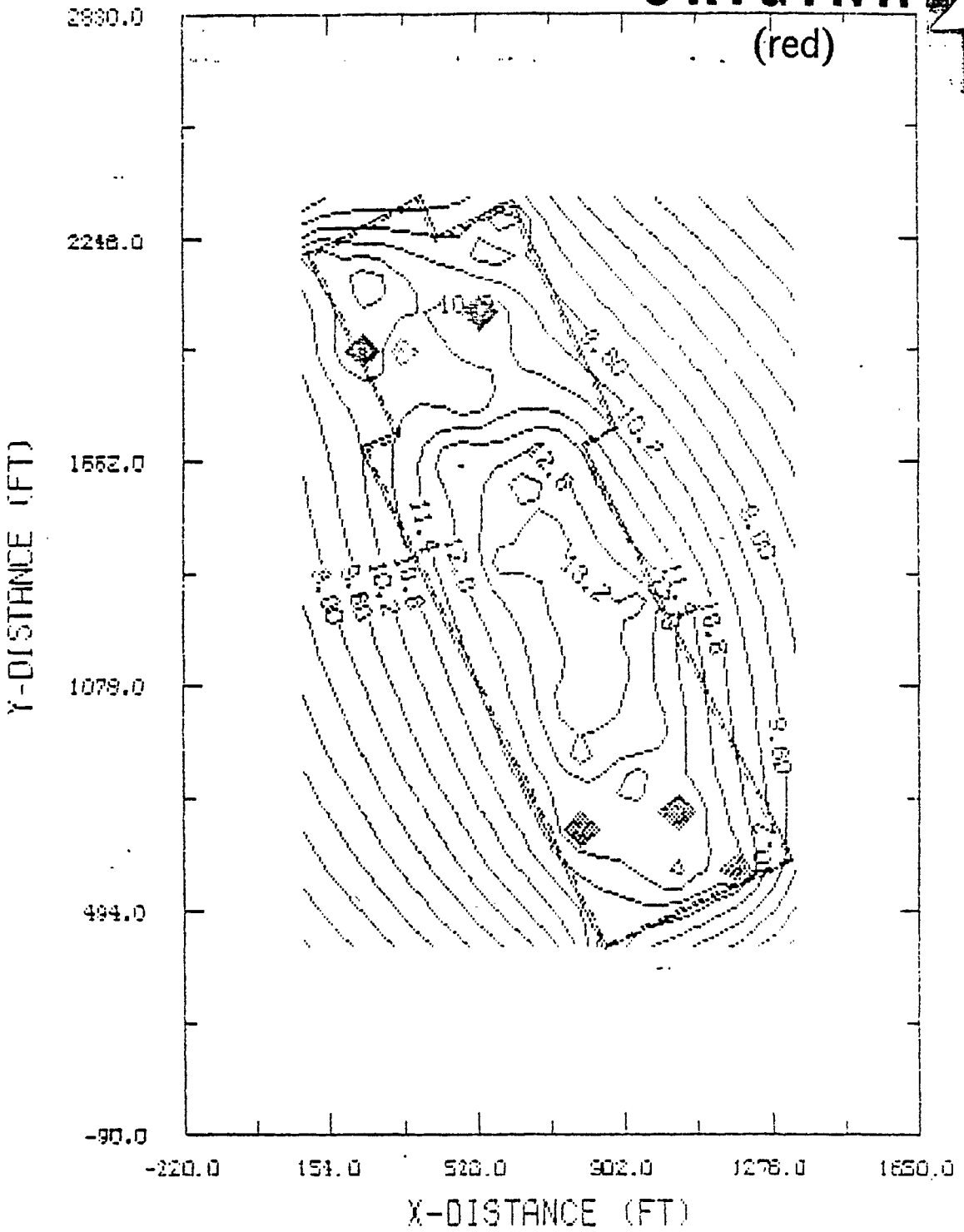
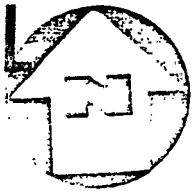
K.3 Water Treatment

K.3.1 General

Retaining groundwater collection as a control technology leads automatically to considering appropriate methods of treatment and disposal. Because groundwater at the Millcreek Site contains volatile and nonvolatile organics and heavy metals,


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PUMPING WITH INJECTION
DRAWDOWN CONTOURS
MILLCREEK SITE, MILLCREEK TWP., PA

K-7

FIGURE K-3
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several different unit processes may have to be combined to effectively treat the water. Three basic categories of treatment for potential application are biological, chemical, and physical.

Based upon review of the available treatment alternatives in Section 11.0, and upon consideration of the groundwater characteristics at the Millcreek Site, the most effective treatment sequence would include a process to reduce dissolved metals concentration (e.g., precipitation); a process to reduce volatile organics loadings (e.g., air stripping); and a process to reduce nonvolatile organics loadings (e.g., carbon absorption or biological treatment). Other treatment components (e.g., filtration, equalization, flocculation/sedimentation) may be required to achieve differing levels of effluent quality, but the basic components will be common to most treatment alternatives.

At most sites, treatment can be accomplished either on site, in specially constructed facilities tailored to specific site requirements, or off site, in an existing Publicly Owned Treatment Works (POTW). Even when offsite treatment is selected, a need for some degree of onsite pretreatment usually exists prior to release to the POTW.

K.3.2 System Design

The groundwater at the Millcreek Site must be treated for removal of volatile organics, dissolved metals, and nonvolatile organics. To ensure a thorough purging of low-flow velocity regions between existing wells, 6 additional wells will be installed to pump water to the surface, and 5 injection wells will be strategically located to inject treated water.

The use of injection wells ensures that the stagnant areas of the contaminated plume can be moved into positions where the groundwater can be lifted to the surface for treatment. The groundwater pumping and treatment system is based on pumping 585 gpm, treating this entire flow, injecting 150 gpm via the 5 injection wells, and releasing 435 gpm to Marshall's Run. During discussions with local

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engineers regarding the capacity of Millcreek Township's sanitary sewer system, NUS learned that the proposed 400-450 gpm flow cannot be discharged to any nearby sewer. This 576,000 to 648,000 gpd flow rate is greater than the total system capacity that the Millcreek Township serves. The nearest sewers with sufficient total capacity are more than 2 miles away, in the city of Erie. Even here, existing sewer flows leave insufficient room for the Millcreek Site's discharge flows. The option to pretreat groundwaters for additional treatment off site in the POTW is not applicable.

The major contaminants identified in groundwater samples were volatile organics, especially 1,2-dichloroethene, and two dissolved metals, iron, and manganese. The relative absence of dissolved toxic metals indicates that they remain in subsurface soils and are not currently migrating into the groundwater. Low levels of other organics, such as phthalates and isophorone, were reported for single monitoring wells only. The groundwater treatment will be used to control of volatile organics. Iron and manganese, even though nontoxic and found at appreciable levels in background samples, will have to be reduced in concentrations before the groundwater can be released or injected into the aquifer. Their presence also would have adverse effects on the treatment components used to remove organics.

The sequence of treatment technologies to be used to remediate the Millcreek Site groundwater is as follows:

- Equalization to eliminate surges in raw groundwater quality.
- Precipitation of dissolved iron and manganese using lime or sodium hydroxide at a pH between 8.0 and 10.0.
- Flocculation/sedimentation of suspended matter in a sedimentation basin or tank. Polymer additions may be used to enhance settling.
- Air stripping of volatile organics, using pack-tower air strippers and counter-current flow.

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- Adsorption of trace metals, residual volatile organics, and other organics, using granular activated carbon columns.
- Separating the treated effluents into two discharge flows -- 150 gpm to aquifer recharge via 5 injection wells, and 435 gpm -- to direct discharge via Marshall's Run.

Variations on the basic treatment sequence proposed above are possible. For example, filtration could be substituted for the flocculation/sedimentation step prior to air stripping. Biological treatment processes could be considered instead of air stripping for removal of organics. However, in this latter case, air stripping has definite advantages over the three retained biological treatment processes (activated sludge, trickling filters, and rotating biological contactors). The biological processes are all more effective in controlling a wide range of organic contaminants, but the Millcreek Site groundwaters contain volatiles only. For this reason, air stripping, which only treat volatiles, is the more efficient unit process for organics control.

A simplified groundwater treatment system for use at Millcreek Site consists of an oxidation/volatilization basin, wherein dissolved iron and manganese may be oxidized by brisk mechanical agitation or air sparging. At the same time, volatile organic compounds will be driven off to the atmosphere. By using theoretical oxygen consumption rates, with dissolved oxygen in water as the primary oxidant, and theoretical half-life data for volatile organics under mixing conditions, it is possible to size the oxidation/volatilization with reasonable retention and mixing times. Aerated groundwaters would overflow to another onsite basin designed to provide enough retention time to settle out the ferric and manganic oxide flocs. Final effluents to Marshall's Run would still contain measurable, but safe, concentrations of the groundwater contaminants

This treatment sequence requires no chemical addition and less complicated treatment components than the air strippers and carbon adsorption systems proposed earlier. Similar systems are widely used to aerate and oxidize ferrous and

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manganous compounds found in coal mine drainage. However, these latter systems usually include chemical addition to neutralize acids in the mine drainage, thus greatly accelerating the rate at which dissolved iron and manganese will precipitate.

Even though the simplified treatment approach appears to have advantages, there are a number of reasons why it should not be considered as an acceptable remedial alternative. First, and most serious, there is no provision for controlling the quantity of volatile organics that will be transferred from groundwater to the ambient atmosphere not only on site, but also in the residential areas immediately adjacent to the site in the prevailing downwind direction. On an average basis, the 3,540 to 4,715 $\mu\text{g/l}$ of one volatile compound -- 1,2-dichloroethene -- represents a potential release of 26.4 to 35.1 pounds per day. The remaining volatile organics will contribute smaller shares to an average total volatile release rate of 28.3 to 36.0 pounds per day. Moreover, depending on which groundwater wells are being pumped at any given time, a potential maximum release of up to 216 pounds per day is possible. The proximity of residential housing to these releases ensures an immediate negative response to this practice, even though groundwater effluents would be of acceptable quality.

The amounts of iron and manganese to be treated are low enough that the projected conversion to ferric and manganic oxides is supportable, especially since mechanical aeration or air sparging will replace the dissolved oxygen consumed during this reaction. Reaction rates will vary with season, but the need for long control times to volatilize high concentrations of 1,2-dichloroethene, estimated to be 3 hours and 20 minutes, should permit oxidation of metals to proceed to completion. However, this long mixing time for a large volume of groundwater will require heavy-duty mechanical mixers or aerators, with an accompanying high energy cost. To allow at least 3 hours, 20 minutes of contact time, the basin volume has to be at least 124,000 gallons. This entire volume must be continuously agitated to provide adequate oxidation and volatilization. Much of the money saved in eliminating air-stripping and chemical addition will have to be spent in operating and maintaining the aeration system, typically a high maintenance item.

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For the above reasons, the simplified system will not be included in the list of remedial alternatives under consideration. The uncontrolled release of volatiles to the atmosphere, while remediating the groundwater, will have adverse impacts on the atmosphere and create unfavorable public reaction to EPA's efforts. The treatment system illustrated in Figure K-4 addresses this problem by controlling volatile emissions by means of a confined air stripper with an activated carbon trap on the exhaust line.

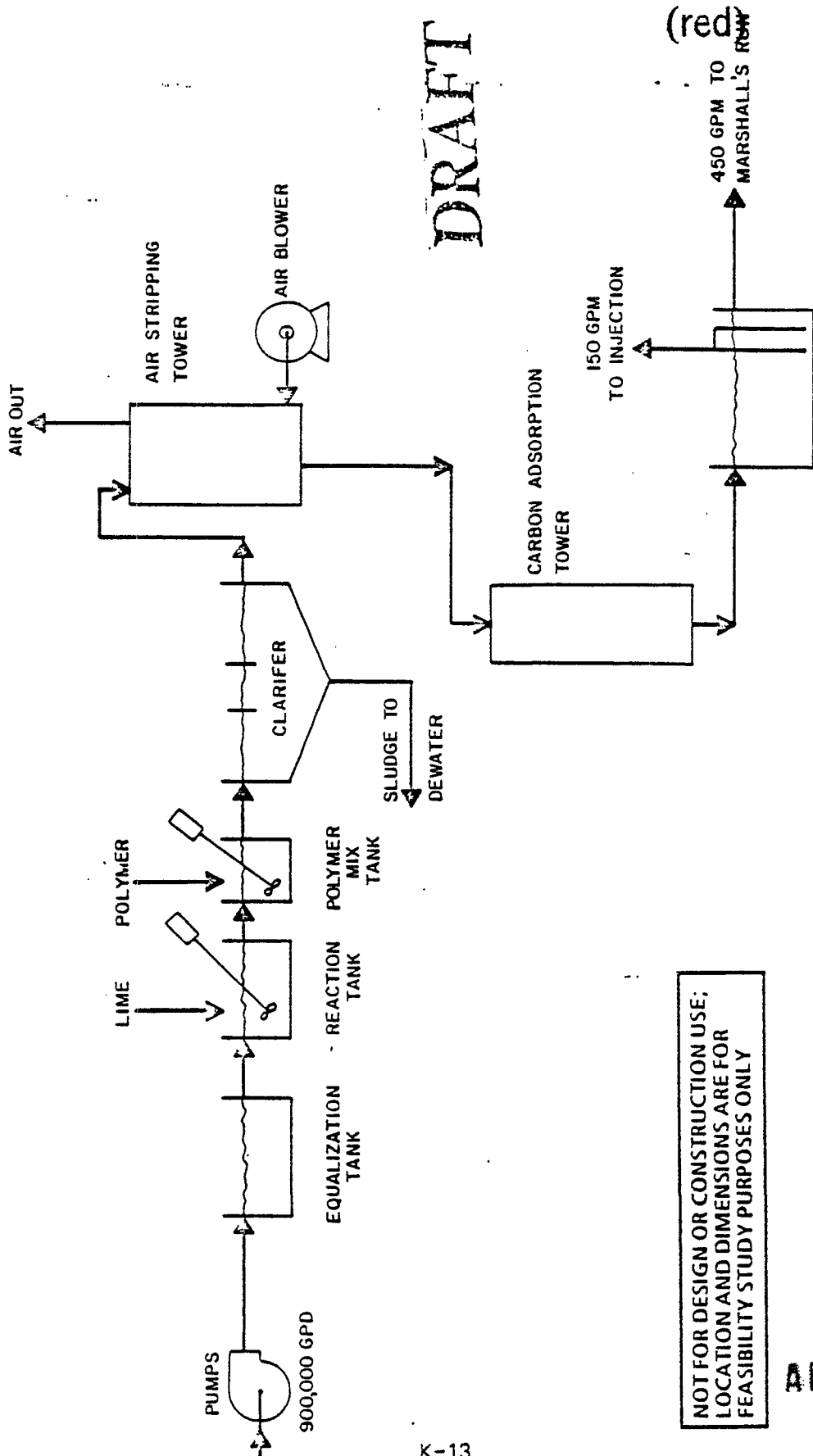
The groundwater treatment system will be designated to accommodate a flow rate of 620 gpm. This allows for some excess capacity to account for minor variations in expected pumping rates, and to permit treatment of the existing pond waters and drainage from sludges and sediments in the same treatment plant. When these waters are brought into the system during the early days of remediation activities, other pumping rates may have to be adjusted to keep from grossly exceeding treatment plant capacity. To prevent overloading, Marshall's Run effluent release rates from the treatment plant should not exceed about 1 cfs (450 gpm). Since the 5 injection wells will each handle 30 gpm, 150 gpm of treatment plant effluent can be injected and 450 gpm discharged, giving a maximum total flow through treatment of 600 gpm. Refer to Figure K-4 for a diagram of the groundwater treatment system, and to Appendix M for details on costs.

Treatment duration is difficult to estimate at this time. Dewatering model studies indicate that groundwater volumes pumped over a 6-month period will provide sufficient flushing to replace the original plume volume 10 to 12 times. However, because of model limitations, costs are based on a more conservative pumping duration of 24 months.

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FIGURE K-4

**GROUNDWATER TREATMENT SYSTEM FOR DIRECT DISCHARGE & INJECTION
MILLCREEK SITE, MILLCREEK TWP., PA**

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APPENDIX L
HYDROLOGIC EVALUATION OF LANDFILL PERFORMANCE

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L1 Hydrologic Evaluation of Landfill Performance

The Hydrologic Evaluation of Landfill Performance (HELP) is a hydrologic model that provides a tool to allow for rapid, economical evaluation of remedial action alternative designs. The model uses climatologic, soil, and design data to produce estimates of water movement across, into, through, and out of a cap and landfill. To accomplish this, the program maintains a water budget by estimating the effects of surface storage (snow) runoff, runoff, infiltration, percolation, evapotranspiration, soil moisture storage, and lateral drainage. The model then estimates the amount of runoff drainage and leachate production that can be expected from a variety of landfill and cap designs.

Internally, the HELP program has available default climatologic and soil data. Default climatologic data consists of 5 years of daily precipitation, mean monthly temperatures, mean monthly solar radiation values, leaf area indices, and winter cover factors for 102 geographic locations. Default soil data consist of porosity, field capacity, wilting point, available water capacity, hydraulic conductivity, and transmissivity for 21 default soil types.

The HELP program has the following design limitation and built-in assumptions:

- The landfill can have no more than nine distinct layers.
- Each layer must be identified as either a vertical percolation, lateral drainage, waste, barrier soil layer, or barrier soil layer with an impermeable membrane.
- Each layer is homogeneous with respect to all soil properties.

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- Vertical percolation layers have hydraulic conductivity high enough to restrict lateral drainage.
- The integrity of a synthetic membrane is constant over a period of time.

As noted previously, installation of a properly designed cap system can significantly reduce the infiltration at the Millcreek Site. Reduced infiltration rates would result in a reduction in contaminant migration. The HELP program was used to analyze the effectiveness of the various cap and landfill alternatives. Table L-1 compares the estimated runoff, percolation, and drainage from the base of the cover that can be expected by the different cap and landfill designs.

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TABLE L-1

COMPARISON OF CAP AND LANDFILL ALTERNATIVES
MILLCREEK SITE
(ALL VALUES INCHES/MONTH)

	<u>Runoff</u>	<u>Percolation</u>	<u>Drainage from Base of Cover</u>
Existing Conditions	0	4.4160	0
Soil Cover	.199	4.059	0
Cap Closure	.227	.0033	1.799
Onsite Landfill	.222	.0028	2.387

Note: Climatologic data from Cleveland, Ohio

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AVERAGE MONTHLY TOTALS FOR 74 THROUGH 78

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION (INCHES)	2.79 3.20	2.29 4.68	3.40 3.04	2.76 2.35	2.95 2.37	3.57 3.33
RUNOFF (INCHES)	0.0 0.000	0.0 0.003	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.001
EVAPOTRANSPIRATION (INCHES)	0.807 2.385	1.181 3.135	2.381 2.318	2.191 1.790	2.312 1.095	2.882 0.803
PERCOLATION FROM BASE OF LANDFILL (INCHES)	0.0001 0.8145	0.0000 1.2494	4.5224 1.1504	1.0329 0.5615	0.5938 0.9572	0.6434 1.8660
DRAINAGE FROM BASE OF LANDFILL (INCHES)	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0

EXISTING SITE CONDITIONS

MILLCREEK SITE, MILLCREEK TWP., PA

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AVERAGE MONTHLY TOTALS FOR 74 THROUGH 78

JAN/JUL FEB/AUG MAR/SEP APR/OCT MAY/NOV JUN/DEC

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION (INCHES)	2.79 3.20	2.29 4.68	3.40 3.04	2.76 2.35	2.95 2.37	3.57 3.33
RUNOFF (INCHES)	0.0 0.066	0.0 0.195	0.199 0.010	0.025 0.001	0.004 0.001	0.001 0.210
EVAPOTRANSPIRATION (INCHES)	0.807 2.769	1.181 3.579	2.303 2.689	2.869 2.039	2.948 1.242	3.253 0.781
PERCOLATION FROM BASE OF LANDFILL (INCHES)	0.0002 0.3148	0.0001 0.5419	4.0595 0.6500	0.9658 0.3126	0.2905 0.5839	0.2848 1.3907
DRAINAGE FROM BASE OF LANDFILL (INCHES)	0.0 0.0	0.0 0.0	0.0 0.0--	0.0 0.0	0.0 0.0	0.0 0.0

SOIL COVER

MILLCREEK SITE, MILLCREEK TWP., PA

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AVERAGE MONTHLY TOTALS FOR 74 THROUGH 78

	<u>JAN/JUL</u>	<u>FEB/AUG</u>	<u>MAR/SEP</u>	<u>APR/OCT</u>	<u>MAY/NOV</u>	<u>JUN/DEC</u>
PRECIPITATION (INCHES)	2.79 3.20	2.29 4.68	3.40 3.04	2.76 2.35	2.95 2.77	3.57 3.33
RUNOFF (INCHES)	0.0 0.068	0.0 0.199	0.227 0.010	0.027 0.001	0.004 0.001	0.001 0.224
EVAPOTRANSPIRATION (INCHES)	0.808 2.740	1.181 3.596	2.287 2.660	2.831 2.018	2.932 1.247	3.239 0.805
PERCOLATION FROM BASE OF COVER (INCHES)	0.0020 0.0025	0.0017 0.0024	0.0028 0.0024	0.0033 0.0024	0.0030 0.0023	0.0025 0.0023
PERCOLATION FROM BASE OF LANDFILL (INCHES)	0.0020 0.0025	0.0017 0.0024	0.0027 0.0024	0.0033 0.0024	0.0030 0.0023	0.0025 0.0028
DRAINAGE FROM BASE OF COVER (INCHES)	0.511 0.558	0.194 0.465	1.096 0.605	1.799 0.500	1.396 0.419	0.794 1.001
DRAINAGE FROM BASE OF LANDFILL (INCHES)	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0

CAP CLOSURE

MILLCREEK SITE, MILLCREEK TWP., PA

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AVERAGE MONTHLY TOTALS FOR 74 THROUGH 78

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION (INCHES)	2.79 3.20	2.29 4.68	3.40 3.04	2.76 2.35	2.95 2.37	3.57 3.33
RUNOFF (INCHES)	0.0 0.068	0.0 0.198	0.222 0.010	0.026 0.001	0.004 0.001	0.001 0.221
EVAPOTRANSPIRATION (INCHES)	0.808 2.740	1.181 3.596	2.297 2.666	2.839 2.017	2.933 1.256	3.235 0.794
PERCOLATION FROM BASE OF COVER (INCHES)	0.0018 0.0023	0.0017 0.0023	0.0026 0.0023	0.0028 0.0023	0.0024 0.0022	0.0022 0.0026
PERCOLATION FROM BASE OF LANDFILL (INCHES)	0.0019 0.0023	0.0017 0.0023	0.0025 0.0023	0.0028 0.0022	0.0024 0.0022	0.0023 0.0026
DRAINAGE FROM BASE OF COVER (INCHES)	0.320 0.380	0.064 0.410	1.871 0.651	2.337 0.449	0.789 0.407	0.773 1.290
DRAINAGE FROM BASE OF LANDFILL (INCHES)	0.000 0.000	0.000 0.000	0.000 0.000	0.000 0.000	0.000 0.000	0.000 0.000

ONSITE LANDFILL

MILLCREEK SITE, MILLCREEK TWP., PA

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BILL OF MATERIALS
Surface Water Treatment
System
(BILLS)

ITEM	QUANTITY	DIRECT UNIT PRICE				DIRECT UNIT COST			ITEM COST	COMMENTS
		MATERIALS	LABOR	EQUIPMENT	SUB.	MATERIALS	LABOR	EQUIPMENT		
1. Equipment										
a. Neutralization Tank	1	FA \$500.00	\$100.00			500	100	600		
b. Neutralization Mixer	1	FA \$800.00	\$200.00			800	200	1000	1.5 1.5 HP	
c. Treat. Supply Pumps	2	FA \$1400.00	\$200.00			2800	400	3200		
d. Equalization Tank	1	FA \$300.00	\$100.00			300	100	400		
e. Polymer Mix Tank	1	FA \$300.00	\$100.00			300	100	400		
f. Piping	1000	FF \$12.00	\$5.90			12000	5900	17900		
g. Treatment Building	150	SF \$5.00	(Total Unit \$)		750	2200	4180	750	Treatment Building	
h. Foundations	11	CY \$200.00	\$380.00	\$20.00				6380	Building & Foundations.	
i. Sedimentation Basin	1	FA		\$200.00			200	7200		
6. Electrical										
a. Motor Starter #1	4	EA \$100.00	\$200.00			3200	800	4000		
b. Disconnect Switch	1	FA \$800.00	\$200.00			800	200	1000		
c. Conduit/Cable/Control	4	EA \$450.00	\$650.00			1800	2600	4400		
d. Grounding/Mixing	2	LOT \$500.00	\$500.00			1000	1000	2000		
Total					750	25700	22500	49200		
Subcontractor @ 10% of Sub. Cost					75			75		
Burden @ 13% of Labor Cost							2935	2935		
Labor @ 15% of Labor Cost							3387	3387		
Material @ 5% of Material Cost						1285		1285		
Total Direct Costs (DDC)					825	26985	28942	56912		
Indirects, 7.5% of Labor DD							21677	21677		
Profit @ 10% of DD								5691		
Total					825	26985	50579	84240		
Boiling Level: B 15								7567		
Health & Safety Monitoring								9187		
at .10										
Field Cost (FFC)								10104		
Company @ 20% of FFC								20211		
Engineering @ 5% of FFC								5053		
Total Cost (TTC) P&M								126318		

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RECEIPT
Surface Debris
Offsite Disposal
(MILITARY)

ITEM	QUANTITY	DIRECT UNIT PRICE			SUB.	DIRECT UNIT COST			ITEM DIRECT COST	COMMENTS
		MATERIALS	LABOR	EQUIPMENT		MATERIALS	LABOR	EQUIPMENT		
Transportation	2500	1A	\$4.00 / 1M (Total Unit \$)		10000			10000	125 miles one way	
Disposal	20	1	\$110.00 / ton (Total Unit \$)		2200			2200	Offsite disposal of	
Disposal - drums	250	1A	\$40.00 / drum (Total Unit \$)		10000			10000	debris, ie. railroad ties, wooden pallets, battery casing, cupolas, piping etc.	
Total:					22200			22200		
Subcontractor @ 10% of Sub. Cost					2220			2220		
Burden @ 1% of Labor Cost								0		
Labor @ 15% of Labor Cost								0		
Material @ 5% of Material Cost								0		
Total Project Costs (TIC)					24420			24420		
Indirects - 75% of Labor TIC								0		
Profit @ 10% of TIC								2442		
Total					24420			26862		
Working Level: C.P. 35								0		
Health & Safety Monitoring @ .10								2606		
Total Field Cost (TFC)								29548		
Contingency @ 20% of TFC								5910		
Engineering @ 5% of TFC								1477		
CAPITAL COST THIS PAGE								36935		

AR000719

ORIGINAL
(red)

MILLCREEK
Groundwater Treatment
System
(MILIGTS)

ITEM	QUANTITY	DIRECT UNIT PRICE			DIRECT UNIT COST			ITEM COST	COMMENTS	
		MATERIALS	LABOR	EQUIPMENT	SUB.	MATERIALS	LABOR			EQUIPMENT
1. Equipment										
a. Neutralization Tank	1 EA	\$6500.00	\$600.00			6500	600	7100		
b. Neutralization Mixer	1 EA	\$6000.00	\$600.00			6000	600	6600	1. b. 7.5 HP	
c. Clarifier	1 EA	\$143100.00	\$37100.00			143100	37100	180200		
d. Lime Feed System	1 EA	\$75000.00	(Total Unit \$)		75000	75000		150000		
e. Clarifier Underflow Pumps	2 EA	\$4000.00	\$300.00			8000	600	8600		
f. Distribution Tank	1 EA	\$9000.00	\$800.00			9000	800	9800		
g. ReInjection Pumps	2 EA	\$3000.00	\$300.00			6000	600	6600		
h. Polymer Feed System	1 EA	\$4500.00	\$400.00			4500	400	4900		
i. Carbon Filter	2 EA	\$110000.00	\$5000.00			220000	10000	230000		
j. Air Stripper	1 EA	\$100000.00	\$40000.00			100000	40000	140000		
k. Treat. Supply Pumps	2 EA	\$5000.00	\$300.00			10000	600	10600		
l. Piping	1400 LF	\$45.15	\$19.20			63210	26800	90090		
m. Treatment Building	1200 SF	\$30.00	(Total Unit \$)		36000			36000	Treatment Building	
n. Foundations	223 CY	\$200.00	\$385.00	\$26.00		44600	65855	110455	136753 Building & Foundations.	
5. Electrical										
a. Motor Starter #1	14 EA	\$800.00	\$200.00			11200	2800	14000		
b. Motor Starter #2	2 EA	\$1300.00	\$300.00			2600	600	3200		
c. Disconnect Switch	4 EA	\$800.00	\$200.00			3200	800	4000		
d. Transformer	1 EA	\$1200.00	\$500.00			1200	500	1700		
e. Conduit, Cable, Control	16 EA	\$455.00	\$680.00			7280	10880	18160		
f. Grounding/Wiring	2 101	\$6000.00	\$6000.00			12000	17000	29000		
Total					111000	733390	231615	5798	1081803	
Subcontractor @ 10% of Sub. Cost					11100				11100	
Burden @ 13% of Labor Cost							30110		30110	
Labor @ 15% of Labor Cost							34742		34742	
Material @ 5% of Material Cost						36670			36670	
Total Direct Costs (TDC)					122100	770060	296467		1194425	
Indirects 75% of Labor TDC							222350		222350	
Profit @ 10% of TDC									119442	
Total					122100	770060	518816		1536216	
Working Level: D=15									77023	
Health & Safety Monitoring @ .06									129123	
Total Final Cost (TFC)									1743163	
Contingency @ 20% of TFC									348633	
Engineering @ 5% of TFC									87158	
CAPITAL COST THIS PAGE									2176954	

AR0000720

ORIGINAL
(red)

HEILIGER
Soil/Membrane/Clay
Alternative 6 & 7
(MILRC)

ITEM	QUANTITY	DIRECT UNIT PRICE			DIRECT UNIT COST			ITEM DIRECT COST	COMMENTS
		MATERIALS	LABOR	EQUIPMENT	SUB.	MATERIALS	LABOR		
Clear & Grub	43	AC	\$1010.00	\$1280.00		0	43430	55040	98470
Grade	46300	CV	\$1.40	\$1.24		0	64620	57412	122232
Topsoil- 6 in.	33100	CV	\$5.50	\$2.83		182050	39720	93673	315443
Soil- 18 in.	99300	CV	\$1.50	\$2.83		148950	119160	281019	549129 2. Common borrow
Filter fabric	396900	SY	\$1.00	\$0.20		396900	79300		476280
Gravel- 12 in.	66200	CV	\$10.00	\$2.83		662000	79440	187346	928786
50 Mil Membrane	1786000	SF	\$0.50	\$0.20		1250200	497448	988281	1250200
Clay- 24 in.	132300	CV	\$9.65	\$7.47		81060			2676429
Chain link fence	8400	LF	\$9.65	(Total Unit: \$)			10472	8322	81060
Revegetation	1870	MSF	\$24.60	\$4.45					64796
Total									
Subcontractor @ 10% of Sub. Cost					1331260	2626602	933870	1671093	6562825
Burden @ 13% of Labor Cost					133126				133126
Labor @ 15% of Labor Cost							121403		121403
Material @ 5% of Material Cost							140081		140081
						131330			131330
Total Direct Costs (IDC)									
Indirects 75% of Labor IDC					1464386	2757932	1195354	1671093	7088764
Profit @ 10% of IDC							896515		896515
Total									
Working level: C, D-.35					1464386	2757932	2091869	1671093	8694156
Health & Safety Monitoring @ .06									1317036
									600672
Total Field Cost (IFC)									
Contingency @ 20% of IFC									10611864
Engineering @ 5% of IFC									2122373
									530593
CAPITAL COST THIS PAGE									
									13264830

AR000721

ORIGINAL DRAFT
(red)

APPENDIX M

FEASIBILITY STUDY COSTING

AR000722

ORIGINAL

(red)

DRAFT

REMEDIAL ACTION ALTERNATIVE 2

AR000723

ORIGINAL
(red)

RECEIPT
Monitoring No. 11
Installation
(MATERIAL)

ITEM	QUANTITY	DIRECT UNIT PRICE			DIRECT UNIT COST			ITEM DIRECT COST	COMMENTS
		MATERIALS	LABOR	EQUIPMENT	MATERIALS	LABOR	EQUIPMENT		
Monitoring No. 11s	100	\$80.00						14400	1. 4 New No. 11s

Total								14400	
Subcontractor @ 10% of Sub. Cost								1440	
Burden @ 1% of Labor Cost							0	0	
Labor @ 15% of Labor Cost							0	0	
Material @ 5% of Material Cost							0	0	

Total Direct Costs (TDC)								15840	
Indirects 7% of Labor TDC							0	0	
Profit @ 10% of TDC								1584	

Total								17424	
Working Level: C, D, J5								0	
Health & Safety Monitoring @ .08								1742	

Total Field Cost (TFC)								19166	
Contingency @ 20% of TFC								3833	
Engineering @ 5% of TFC								958	

CAPITAL COST THIS PAGE								23952	

AR000724

SITE: BULLCREEK
 ALTERNATIVE NO. 2
 15/73

PRESENT NORTH ANALYSIS

COST COMPONENT	COST/YEAR COST OCCURS (\$000's)											
	0	1	2	3	4	5	6	7	8	9	10	11
1. CAPITAL COSTS	24											
2. O & M COSTS	---	159	159	159	159	159	159	159	159	159	159	159
3. ANNUAL COSTS	24	159	159	159	159	159	159	159	159	159	159	159
4. ANNUAL DISCOUNT RATE=10%	1	0.909	0.826	0.751	0.683	0.621	0.564	0.513	0.467	0.424	0.386	0.35
PRESENT NORTH =	24	145	131	119	109	99	90	82	74	67	61	56

12	13	14	15	16	17	18	19	20	21	22	23	
G & M COSTS	159	159	159	159	159	159	159	159	159	159	159	159
ANNUAL DISCOUNT RATE=10%	0.319	0.29	0.263	0.239	0.218	0.198	0.18	0.164	0.149	0.135	0.123	0.112
PRESENT NORTH =	51	46	42	38	35	31	29	26	24	21	20	18

COST COMPONENT	COST/YEAR COST OCCURS (\$000's)											
	0	1	2	3	4	5	6	7	8	9	10	11
0 & F COSTS	24	25	26	27	28	29	30					
ANNUAL DISCOUNT RATE=10%	0.101	0.092	0.084	0.076	0.069	0.063	0.057					
PRESENT NORTH =	16	15	13	12	11	10	9					

TOTAL PRESENT NORTH (000's)												
												1523

ORIGINAL
 (red)

AR000725

SUMMARY OF SENSITIVITY ANALYSIS

(COST IN THOUSANDS)

COST FACTOR	BASELINE COST	SENSITIVITY FACTOR EXAMINED RESULTS			
CAPITAL COSTS (\$):	24				(red)
PRESENT WORTH (\$):	1,523				
ANNUAL COSTS Year's	1	159			
	2				
	3				
	4				
	5				
	6				
	7				
	8				
	9				
	10				
	11				
	12				
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28					
29					
30					

ORIGINAL

AR000726

ORIGINAL ^{DRAFT}
(red)

REMEDIAL ACTION ALTERNATIVE 3

AR000727

MILLCREEK
 Excavation-Alternatives 3 & 4
 Onsite Disposal
 (MILLC)

ITEM	QUANTITY	DIRECT UNIT PRICE			SUB.	DIRECT UNIT COST			ITEM DIRECT COST	COMMENTS
		MATERIALS	LABOR	EQUIPMENT		MATERIALS	LABOR	EQUIPMENT		
Excavation	12700	CY	\$1.67	\$2.58	0	21209	32766	53975	Southeast corner	
Excavation	4700	CY	\$1.67	\$2.58	0	7849	12126	19975	Erosion control bench	
Bridge Swamp	4200	CY	\$4.19	\$5.05	0	17598	21210	38808		
Backfill Swamp	4200	CY	\$1.50	\$2.83	6300	5040	11806	23226		
Still Fences	2800	LF	\$2.25	\$0.16	6300	448	0	6748		
Total					0	52144	77908	142732		
Subcontractor @ 10% of Sub. Cost					0			0		
Burden @ 13% of Labor Cost						6779		6779		
Labor @ 15% of Labor Cost						7822		7822		
Material @ 5% of Material Cost						630		630		
Total Direct Costs (TDC)					0	13230	77908	157962		
Indirects 75% of Labor TDC						50058		50058		
Profit @ 10% of TDC								15796		
Total					0	13230	77908	223817		
Working Level: C-7								136353		
Health & Safety Monitoring @ .10								36017		
Total Field Cost (IFC)								396187		
Contingency @ 20% of IFC								79237		
Engineering @ 5% of IFC								19809		
CAPITAL COST THIS PAGE								495234		

ORIGINAL
(red)

AR000728

ORIGINAL
(red)

MILLCREEK
Selective Soil Cover
Alternative 3 & 4
(BEST SOIL)

ITEM	QUANTITY	DIRECT UNIT PRICE			DIRECT UNIT COST			ITEM DIRECT COST	COMMENTS
		MATERIALS	LABOR	EQUIPMENT	MATERIALS	LABOR	EQUIPMENT		
Clear & Grub	18 AC	\$1010.00		\$1280.00	0	18180	23040	41220	
Grade	24800 CY	\$0.66		\$3.11	0	16368	77178	93496	
Topsoil- 6 in.	14500 CY	\$5.50		\$2.83	79750	17400	41035	138185	
Soil- 18 in.	43600 CY	\$1.50		\$2.83	65400	52320	123388	241108	
Chain Link Fence- 6 ft.	8400 LF	\$9.65		(Total Unit \$)	81060			81060	
Revegetation	785 MSF	\$24.60		\$4.45	19311	4396	3493	27200	
Total					81060	164461	268084	622269	
Subcontractor @ 10% of Sub. Cost					8106			8106	
Burden @ 13% of Labor Cost						14126		14126	
Labor @ 15% of Labor Cost						16300		16300	
Material @ 5% of Material Cost					8223			8223	
Total Direct Costs (TDC)					89166	172684	268084	669024	
Indirects 7 1/2% of Labor TDC						104317		104317	
Profit @ 10% of TDC								66902	
Total					89166	172684	268084	840244	
Working Level: C.D.-.35								179022	
Health & Safety Monitoring @ .08								81541	
Total Field Cost (IFC)								1100807	
Contingency @ 20% of IFC								220161	
Engineering @ 5% of IFC								55040	
CAPITAL COST THIS PAGE								1376009	

AR000729

ORIGINAL
(red)

RECURRING
Surface Debris
Offsite Disposal
(MILLIBRETS)

ITEM	QUANTITY	DIRECT UNIT PRICE			DIRECT UNIT COST			ITEM DIRECT COST	COMMENTS
		MATERIALS	LABOR	EQUIPMENT	SUB.	MATERIALS	LABOR		
Transportation	2500	EM	\$4.00 / EM (Total Unit \$)		10000			10000	CLCOS-125 miles one way
Disposal	20	T	\$110.00 / ton (Total Unit \$)		2200			2200	Offsite disposal of
Disposal - drums	250	EA	\$40.00 / drum (Total Unit \$)		10000			10000	debris, ie. railroad ties, wooden pallets, battery casing, cupolas, piping etc.
Total					22200			22200	
Subcontractor @ 10% of Sub. Cost					2220			2220	
Burden @ 13% of Labor Cost								0	
Labor @ 15% of Labor Cost								0	
Material @ 5% of Material Cost								0	
Total Direct Costs (TDC)					24420			24420	
Indirects 75% of Labor TDC								0	
Profit @ 10% of TDC								2442	
Total					24420			26862	
Working level: C, D-.35								0	
Health & Safety Monitoring @ .10								2686	
Total Field Cost (TFC)								29548	
Contingency @ 20% of TFC								5910	
Engineering @ 5% of TFC								1477	
CAPITAL COST THIS PAGE								36935	

AR000730

ORIGINAL
(red)

REVISIONS
Monitoring Well
Installation
(MILWAUKEE)

ITEM	QUANTITY	DIRECT UNIT PRICE			DIRECT UNIT COST			ITEM DIRECT COST	COMMENTS
		MATERIALS	LABOR	EQUIPMENT	MATERIALS	LABOR	EQUIPMENT		
Monitoring Wells	100	IF	\$80.00	(Total Unit \$)	14400		14400	1. 4 New Wells	
Total					14400		14400		
Subcontractor @ 10% of Sub. Cost					1440		1440		
Burden @ 13% of Labor Cost					0	0	0		
Labor @ 15% of Labor Cost					0	0	0		
Material @ 5% of Material Cost					0	0	0		
Total Direct Costs (DDC)					15840	0	15840		
Indirects 7.5% of Labor DDC					0	0	0		
Profit @ 10% of DDC					1584	0	1584		
Total					15840	0	17424		
Working Level: C.D. .35					0	0	0		
Health & Safety Monitoring @ .08					0	0	0		
Total Field Cost (IFC)					1742	0	1742		
Contingency @ 20% of IFC					19166	0	19166		
Engineering @ 5% of IFC					3833	0	3833		
CAPITAL COST THIS PAGE					958	0	958		
					23952	0	23952		

AR000731

MILLCREEK
 Stormwater Management System
 Alternative 3 & 4
 (MILLSMS)

ITEM	QUANTITY	DIRECT UNIT PRICE				SUB.	DIRECT UNIT COST				ITEM DIRECT COST	COMMENTS
		MATERIALS	LABOR	EQUIPMENT			MATERIALS	LABOR	EQUIPMENT			
Excavation	11000	CY	\$1.67	\$2.58			0	16370	28380		46750	
Clay- 2 ft.	3660	CY	\$3.76	\$7.47			32940	13762	27340		74042	
30 Mil Membrane	49420	SF	\$0.30	\$0.20			14826	9884	0		24710	
Sand/Gravel- 1 ft.	1830	CY	\$10.00	\$1.20			18300	2196	5179		25675	3-8 in. diameter
Stone- 1 ft.	1830	CY	\$10.00	\$1.20			18300	2196	5179		25675	
Embankments	1370	CY	\$9.00	\$3.76			12330	5151	10234		27715	
Concrete Pipe- 15 in.	60	LF	\$6.20	\$3.12			372	187	29		588	
Sheet Piling	140	SF	\$6.40	\$1.29			896	181	209		1285	
Weir	2	EA	\$1000.00	\$500.00			2000	1000	0		3000	
Stone Riprap	120	CY	\$7.50	\$4.87			900	584	592		2076	
Silt Fences	1400	LF	\$2.25	\$0.16			3150	224	0		3374	
Total						0	104014	53735	77141		234890	
Subcontractor @ 10% of Sub. Cost						0					0	
Burden @ 13% of Labor Cost								6986			6986	
Labor @ 15% of Labor Cost								8060			8060	
Material @ 5% of Material Cost							5201				5201	
Total Direct Costs (IDC)						0	109215	68781	77141		255136	
Indirects 75% of Labor IDC								51586			51586	
Profit @ 10% of IDC											25514	
Total						0	109215	120366	77141		332236	
Working level: D=.15											29626	
Health & Safety Monitoring @ .10											36186	
Total Field Cost (TFC)											398048	
Contingency @ 20% of TFC											79610	
Engineering @ 5% of TFC											19902	
CAPITAL COST THIS PAGE											497560	

ORIGINAL
 (red)

AR000732

ORIGINAL
(red)

MILLCREEK
Stormwater Management System Dewatering
Alternative 3 & 4
(MILLSMSD)

ITEM	QUANTITY	DIRECT UNIT PRICE			DIRECT UNIT COST			ITEM DIRECT COST	COMMENTS
		MATERIALS	LABOR	EQUIPMENT	MATERIALS	LABOR	EQUIPMENT		
Dewatering Wells	14								
Boring	280	LF	\$40.00 (total unit \$)		11200		11200	14 wells @ 20' ea.	
Well Screen	70	LF	\$8.00 (total unit \$)		560		560	One stormwater pond will be constructed at a time. Therefore, some material will be used twice.	
Install Well Screen	140	LF	\$5.00 (total unit \$)		700		700		
Gravel Pack- 8.72 cf/well	125	CF	\$4.00 (total unit \$)		500		500		
PVC Riser- 6 in.	70	LF	\$8.00 (total unit \$)		560		560		
Install PVC Riser	140	LF	\$4.00 (total unit \$)		560		560		
Pipe Manifold & Conductor	1000	LF	\$10.00 (total unit \$)		10000		10000		
Electric Cable	2000	LF	\$6.00 (total unit \$)		12000		12000		
Install & Pull Pumps	14	EA	\$700.00 (total unit \$)		9800		9800		
Pull Wells	14	EA	\$5.00 (total unit \$)		70		70		
Plug Wells	70	CF	\$30.00 (total unit \$)		2100		2100		
Mob/Remob			\$5000.00 (total unit \$)		5000		5000		
Total					53050		53050		
Subcontractor @ 10% of Sub. Cost					5305		5305		
Burden @ 13% of Labor Cost					0		0		
Labor @ 15% of Labor Cost					0		0		
Material @ 5% of Material Cost					0		0		
Total Direct Costs (IDC)					58355		58355		
Indirects 75% of Labor IDC					0		0		
Profit @ 10% of IDC					5836		5836		
Total					64191		64191		
Working Level: D=.15					0		0		
Health & Safety Monitoring @ .10					6419		6419		
Total Field Cost (IFC)					70610		70610		
Contingency @ 20% of IFC					14122		14122		
Engineering @ 10% of IFC					7061		7061		
CAPITAL COST THIS PAGE					91792		91792		

AR000733

ORIGINAL

(red)

HILLCREEK
Surface Water Treatment
System
(HILLSMT)

ITEM	QUANTITY	DIRECT UNIT PRICE			SUB.	DIRECT UNIT COST			ITEM DIRECT COST	COMMENTS
		MATERIALS	LABOR	EQUIPMENT		MATERIALS	LABOR	EQUIPMENT		
1. Equipment										
a. Neutralization Tank	1	EA \$500.00	\$100.00			500	100	600		
b. Neutralization Mixer	1	EA \$800.00	\$200.00			800	200	1000		
c. Treat. Supply Pumps	2	EA \$1400.00	\$200.00			2800	400	3200		1. b. 1.5 HP
d. Equalization Tank	1	EA \$300.00	\$100.00			300	100	400		
e. Polymer Mix Tank	1	EA \$300.00	\$100.00			300	100	400		
2. Piping	1000	LF \$12.00	\$5.90			12000	5900	17900		
3. Treatment Building	150	SF \$5.00	(Total Unit \$)		750	2200	4180	750	6380	Treatment Building
4. Foundations	11	CY \$200.00	\$380.00	\$20.00			7000	7200		Building & Foundations.
5. Sedimentation Basin	1	EA	\$7000.00	\$200.00						
b. Electrical										
a. Motor Starter #1	4	EA \$800.00	\$200.00			3200	800	4000		
c. Disconnect Switch	1	EA \$800.00	\$200.00			800	200	1000		
c. Conduit,Cable,Control	4	EA \$450.00	\$650.00			1800	2600	4400		
d. Grounding/Wiring	2	LOT \$500.00	\$500.00			1000	1000	2000		
Total						750	25700	22580	49230	
Subcontractor @ 10% of Sub. Cost						75			75	
Burden @ 13% of Labor Cost							2935	2935		
Labor @ 15% of Labor Cost							3387	3387		
Material @ 5% of Material Cost							1285	1285		
Total Direct Costs (TDC)						825	26985	28902	56912	
Indirects 75% of Labor TD							21677	21677		
Profit @ 10% of TDC								5691		
Total						825	26985	50579	84280	
Working level: D=.15									7587	
Health & Safety Monitoring									9187	
at .10										
Total Field Cost (TFC)									101054	
Contingency @ 20% of TFC									20211	
Engineering @ 5% of TFC									5053	
CASH COST THIS PAGE									126318	

A8000734

ORIGINAL
(red)

SITE: HILLCREEK
ALTERNATIVE NO.: 3
4388

PRESENT WORTH ANALYSIS

COST COMPONENT	0	1	2	3	4	5	6	7	8	9	10	11
1. CAPITAL COSTS	2679											
2. O & M COSTS	---	181	181	181	181	181	181	181	181	181	161	181
3. ANNUAL COSTS	2679	181	181	181	181	181	181	181	181	181	161	181
4. ANNUAL DISCOUNT RATE=10%	1	0.909	0.826	0.751	0.683	0.621	0.564	0.513	0.467	0.424	0.386	0.35
PRESENT WORTH =	2679	165	150	136	124	113	102	93	85	77	70	63

O & M COSTS	181	181	181	181	181	181	181	181	181	181	181	181
ANNUAL DISCOUNT RATE=10%	0.319	0.29	0.263	0.239	0.218	0.198	0.18	0.164	0.149	0.135	0.123	0.112
PRESENT WORTH =	58	53	48	43	40	36	33	30	27	24	22	20

TOTAL PRESENT WORTH (000's)	24	25	26	27	28	29	30	30	30	27	24	20
O & M COSTS	181	181	181	181	181	181	181	181	181	181	181	181
ANNUAL DISCOUNT RATE=10%	0.101	0.092	0.084	0.076	0.069	0.063	0.057	0.057	0.057	0.057	0.057	0.057
PRESENT WORTH =	18	17	15	14	13	11	10	10	10	10	10	10
=====												
4388												
=====												

AR000735

KEMEDIAL ACTION ALTERNATIVE

SUMMARY OF SENSITIVITY ANALYSIS

(COST IN THOUSANDS)

COST FACTOR	BASELINE COST	SENSITIVITY FACTOR EXAMINED RESULTS		
		LOW	HIGH	
CAPITAL COSTS (\$):	2,679	2,310	3,090	
PRESENT WORTH (\$):	4,388	4,019	4,799	
ANNUAL COSTS (YEARS)	1	181	181	181
	2			
	3			
	4			
	5			
	6			
	7			
	8			
	9			
	10			
	11			
	12			
	13			
	14			
	15			
	16			
	17			
	18			
	19			
	20			
				AR000736

ORIGINAL

(red)

DRAFT

ORIGINAL

(red)

REMEDIAL ACTION ALTERNATIVE 4

AR000737

ORIGINAL
(red)

MILLCREEK
Excavation-Alternatives 3 & 4
Onsite Disposal
(MILCXX)

ITEM	QUANTITY	DIRECT UNIT PRICE			SUB.	DIRECT UNIT COST			ITEM DIRECT COST	COMMENTS
		MATERIALS	LABOR	EQUIPMENT		MATERIALS	LABOR	EQUIPMENT		
Excavation	12700	CY	\$1.67	\$2.58		0	21209	32766	53975	Southeast corner
Excavation	4700	CY	\$1.67	\$2.58		0	7849	12126	19975	Erosion control bench
Dredge Swamp	4200	CY	\$4.19	\$5.05		0	17598	21210	38808	
Backfill Swamp	4200	CY	\$1.50	\$2.83		6300	5040	11886	23226	
Silt fences	2800	LF	\$2.25	\$0.16		6300	448	0	6748	
Total						0	52144	77988	142732	
Subcontractor @ 10% of Sub. Cost						0			0	
Burden @ 13% of Labor Cost							6779		6779	
Labor @ 15% of Labor Cost							7822		7822	
Material @ 5% of Material Cost						630			630	
Total Direct Costs (IDC)						0	13230	77988	157962	
Indirects 75% of Labor IDC							50058		50058	
Profit @ 10% of IDC							15796		15796	
Total						0	116803	77988	223817	
Working Level: C-7									136353	
Health & Safety Monitoring @ .10									36017	
Total Field Cost (IFC)									396187	
Contingency @ 20% of IFC									79237	
Engineering @ 5% of IFC									19809	
CAPITAL COST THIS PAGE									495234	

AR000738

ORIGINAL
(red)

MILLERIK
Selective Soil Cover
Alternative J & K
(BILL#611)

ITEM	QUANTITY	DIPLCT UNIT PRICE			SUB.	DIPLCT UNIT COST			ITEM DIRLCT COST	COMMENTS
		MATERIALS	LABOR	EQUIPMENT		MATERIALS	LABOR	EQUIPMENT		
Clean & Grub	16 AC	\$1010.00		\$1200.00	81060	0	18100	23040	41220	
Grade	24800 CY	10.66		13.11	8106	0	16368	77178	93496	
Topsoil- 6 in.	14500 CY	11.20		12.83		79750	17400	41035	138185	
Soil- 18 in.	43000 CY	11.50		12.83		65400	52320	123308	241108	
Chain Link fence- 6 ft.	8400 LF	19.65		(Total Unit \$)	81060	19311	4396	3493	81060	
Revegetation	785 MSF	174.60		14.45					27200	
Total					81060	164461	108664	268084	622269	
Subcontractor @ 10% of Sub. Cost					8106				8106	
Burden @ 13% of Labor Cost							14126		14126	
Labor @ 15% of Labor Cost							16300		16300	
Material @ 5% of Material Cost						8223			8223	
Total Direct Costs (TDC)					89166	172684	139090	268084	669024	
Indirects 75% of Labor TDC							104317		104317	
Profit @ 10% of TDC									66902	
Total					89166	172684	243407	268084	840244	
Marketing Level: C.O. .35									179022	
Health & Safety Monitoring @ .08									81541	
Total Field Cost (TFC)									1100807	
Contingency @ 20% of TFC									220161	
Engineering @ 5% of TFC									55040	
CAPITAL COST THIS PAGE									1376009	

AR000739

ORIGINAL
(red)

MILCREEK
Production Well
Installation
(MILCREEK)

ITEM	QUANTITY	DIRECT UNIT PRICE			DIRECT UNIT COST			ITEM DIRECT COST	COMMENTS
		MATERIALS	LABOR	EQUIPMENT	MATERIALS	LABOR	EQUIPMENT		
Production Wells	1440	\$80.00 (Total Unit \$)			14400			14400	1. 4 New Wells
Total					14400			14400	
Subcontractor @ 10% of Sub. Cost					1440			1440	
Burden @ 13% of Labor Cost						0		0	
Labor @ 15% of Labor Cost						0		0	
Material @ 5% of Material Cost						0		0	
Total Direct Costs (IDC)					15840	0	0	15840	
Indirects 7.5% of Labor IDC						0		0	
Profit @ 10% of IDC								1584	
Total					15840	0	0	17424	
Working Level: C.O. .35								1742	
Health & Safety Monitoring @ .08								19166	
Total Field Cost (IFC)								36333	
Contingency @ 20% of IFC								958	
Engineering @ 5% of IFC								23958	
CAPITAL COST THIS PAGE									

AR000740

MILLERK
 Stormwater Management System
 Alternative 3 & 4
 (MILLERS)

ITEM	QUANTITY	DIRECT UNIT PRICE			DIRECT UNIT COST			ITEM DIRECT COST	COMMENTS
		MATERIALS	LABOR	EQUIPMENT	MATERIALS	LABOR	EQUIPMENT		
Excavation	11000		\$1.67	\$2.50	0	16370	26700	46750	
Clay - 7 ft.	3660		\$3.76	\$7.47	32940	13762	27340	74042	
30 Mt Embolane	49420		\$0.30	\$0.20	14826	9804	0	24710	
Sand/Gravel - 1 ft.	1870		\$10.00	\$1.20	18300	2196	5179	25675	
Stone - 1 ft.	1830		\$10.00	\$2.83	18300	2196	5179	25675	3-8 in. diameter
Embarkments	1370		\$9.00	\$7.47	12330	5151	10234	27715	
Concrete Pipe- 15 in.	60		\$6.40	\$0.48	372	187	29	588	
Sheet Piling	140		\$6.40	\$1.29	896	181	209	1285	
Rein	2		\$1000.00	\$500.00	2000	1000	0	3000	
Stone Piping	170		\$7.50	\$4.87	900	584	592	2076	
Silt Fences	1400		\$2.25	\$0.16	3150	224	0	3374	
Total			0	104014	53735	77141	234890	0	
Subcontractor @ 10% of Sub. Cost			0				6986	6986	
Burden @ 13% of Labor Cost							8060	8060	
Labor @ 15% of Labor Cost							5201	5201	
Material @ 5% of Material Cost									
Total Direct Costs (IDC)			0	109215	68781	77141	255136	255136	
Indirects - 7% of Labor IDC							51586	51586	
Profit @ 10% of IDC							25514	25514	
Total			0	109215	120366	77141	332236	332236	
Working level: D-15							29626	29626	
Health & Safety Monitoring @ .10							36106	36106	
Total Field Cost (IFC)							398048	398048	
Contingency @ 20% of IFC							79610	79610	
Engineering @ 5% of IFC							19902	19902	
CAPITAL COST THIS PAGE							497560	497560	

ORIGINAL
 (red)

AR000741

ORIGINAL
(red)

NIIC/IFK
Stormwater Management System Dewatering
Alternative 3 & 4
(MILWAUKEE)

ITEM	QUANTITY	DIRECT UNIT PRICE			DIRECT UNIT COST			ITEM DIRECT COST	COMMENTS
		MATERIALS	LABOR	EQUIPMENT	MATERIALS	LABOR	EQUIPMENT		
Dewatering Wells	14								14 wells @ 20' ea.
Boring	260	LF	\$40.00 (total unit \$)		11200		11200		One stormwater pond
Well Screen	70	LF	\$8.00 (total unit \$)		560		560		will be constructed
Install Well Screen	140	LF	\$5.00 (total unit \$)		700		700		at a time. Therefore,
Gravel Pack - 8.72 cf/well	125	CF	\$4.00 (total unit \$)		500		500		some material will be
PVC Riser - 6 in.	70	LF	\$8.00 (total unit \$)		560		560		used twice.
Install PVC Riser	140	LF	\$4.00 (total unit \$)		560		560		
Pipe Manifold & Conductor	1000	LF	\$10.00 (total unit \$)		10000		10000		
Electric Cable	2000	LF	\$6.00 (total unit \$)		12000		12000		
Install & Pull Pumps	14	EA	\$700.00 (total unit \$)		9800		9800		
Pull Wells	14	EA	\$5.00 (total unit \$)		70		70		
Plug Wells	70	CF	\$30.00 (total unit \$)		2100		2100		
Reb./Remob			\$5000.00 (total unit \$)		5000		5000		
Total					53050		53050		
Subcontractor @ 10% of Sub. Cost					5305		5305		
Burden @ 13% of Labor Cost					0		0		
Labor @ 15% of Labor Cost					0		0		
Material @ 5% of Material Cost					0		0		
Total Direct Costs (IDC)					58355		58355		
Indirects 75% of Labor IDC					0		0		
Profit @ 10% of IDC					5836		5836		
Total					64191		64191		
Boring Level: B=15					0		0		
Health & Safety Monitoring @ .10					6419		6419		
Total Field Cost (TFC)					70610		70610		
Contingency @ 20% of TFC					14122		14122		
Engineering @ 10% of TFC					7061		7061		
CAPITAL COST THIS PAGE					91792		91792		

AR000742

ORIGINAL
(red)

PROJECT
Surface Water Treatment
System
(MILWAUKEE)

ITEM	QUANTITY	DIRECT UNIT PRICE			DIRECT UNIT COST			ITEM DIRECT COST	COMMENTS
		MATERIALS	LABOR	EQUIPMENT	MATERIALS	LABOR	EQUIPMENT		
1. Equipment									
a. Neutralization Tank	1	EA \$500.00	\$100.00		500	100		600	
b. Neutralization Mixer	1	EA \$800.00	\$200.00		800	200		1000	1-b. 1.5 HP
c. Treat. Supply Pumps	2	EA \$400.00	\$200.00		2800	400		3200	
d. Equalization Tank	1	EA \$300.00	\$100.00		300	100		400	
e. Polymer Mix Tank	1	EA \$300.00	\$100.00		300	100		400	
2. Piping	1000	LF \$12.00	\$5.90		12000	5900		17900	
3. Treatment Building	150	SF \$5.00	(Total Unit \$)		750			750	Treatment Building
4. Foundations	11	CY \$200.00	\$20.00		2200	4180		6380	Building & Foundations.
5. Sedimentation Basin	1	EA \$7000.00	\$200.00			7000	200	7200	
6. Electrical									
a. Motor Starter #1	4	EA \$800.00	\$200.00		3200	800		4000	
b. Disconnect Switch	1	EA \$800.00	\$200.00		800	200		1000	
c. Conduit, Cable, Control	4	EA \$450.00	\$650.00		1800	2600		4400	
d. Grounding/Wiring	2	LOI \$500.00	\$500.00		1000	1000		2000	
Total					750	25700	200	49230	
Subcontractor @ 10% of Sub. Cost					75			75	
Markup @ 13% of Labor Cost						2935		2935	
Labor @ 15% of Labor Cost						3387		3387	
Material @ 5% of Material Cost					1285			1285	
Total Direct Costs (DDC)					825	26985	28902	56912	
Indirects 7.5% of Labor @						21677		21677	
Profit @ 10% of DDC						5691		5691	
Total					825	26985	50579	84280	
Working Level: @ .15								7587	
Health & Safety Monitoring at .10								9187	
Total Field Cost (DFC)								101054	
Contingency @ 20% of DDC								20211	
Engineering @ 5% of DDC								5053	
TOTAL COST THIS PAGE								126318	

AP000743

ORIGINAL
(red)

DEBITORIA
Offsite Debris
Offsite Disposal
(FIELD DEBRIS)

ITEM	QUANTITY	DIRECT UNIT PRICE			DIRECT UNIT COST			ITEM COST	COMMENTS
		MATERIALS	LABOR	EQUIPMENT	MATERIALS	LABOR	EQUIPMENT		
Transportation	2500	LM	\$4.00 / LM	(Total Unit \$)	10000			10000 CECOS-125 miles one way	
Disposal	20	T	\$110.00 / ton	(Total Unit \$)	2200			2200 Offsite disposal of	
Disposal- drums	250	LA	\$40.00 / drum	(Total Unit \$)	10000			10000 debris, ie. railroad ties, wooden pallets, 22200 battery casing, cupolas, 2220 piping etc.	
Total					22200				
Subcontractor @ 10% of Sub. Cost					2220				
Burden @ 13% of Labor Cost									
Taxen @ 15% of Labor Cost									
Material @ 5% of Material Cost									
Total Direct Costs (DRC)					24420				
Indirects 75% of Labor DRC									
Profit @ 10% of DRC									
Total					24420				
Molding level: C.P. .35									
Health & Safety Penitoning @ .10									
Total Field Cost (FFC)									
Contingency @ 20% of FFC									
Engineering @ 5% of FFC									
CAPITAL COST THIS PAGE									
								26862	
								0	
								2686	
								29548	
								5910	
								1477	
								36935	

AR000744

ORIGINAL

(red)

MILLCREEK
Groundwater Treatment
System
(MILLIGIS)

ITEM	QUANTITY	DIRECT UNIT PRICE			DIRECT UNIT COST			ITEM DIRECT COST	COMMENTS
		MATERIALS	LABOR	EQUIPMENT	MATERIALS	LABOR	EQUIPMENT		
1. Equipment									
a. Neutralization Tank	1 EA	\$6500.00	\$600.00		6500	600	7100		
b. Neutralization Mixer	1 EA	\$6000.00	\$600.00		6000	600	6600	I. b. 7.5 HP	
c. Clarifier	1 EA	\$143100.00	\$37100.00		143100	37100	180200		
d. Line Feed System	1 EA	\$75000.00	(Total Unit \$)		75000		150000		
e. Clarifier Underflow Pumps	2 EA	\$4000.00	\$300.00		8000	600	8600		
f. Distribution Tank	1 EA	\$9000.00	\$800.00		9000	800	9800		
g. Reinjection Pumps	2 EA	\$3000.00	\$300.00		6000	600	6600		
h. Polymer Feed System	1 EA	\$4500.00	\$400.00		4500	400	4900		
i. Carbon filter	2 EA	\$110000.00	\$5000.00		220000	10000	230000		
j. Air Stripper	1 EA	\$100000.00	\$40000.00		100000	40000	140000		
k. Treat. Supply Pumps	2 EA	\$5000.00	\$300.00		10000	600	10600		
2. Piping	1400 LF	\$45.15	\$19.20		63210	26880	90090		
3. Treatment Building	1200 SF	\$30.00	(Total Unit \$)		36000		36000	Treatment Building	
4. Foundations	223 CY	\$200.00	\$385.00	\$26.00	44600	85855	130455	Building & Foundations.	
5. Electrical									
a. Motor Starter #1	14 EA	\$800.00	\$200.00		11200	2800	14000		
b. Motor Starter #2	2 EA	\$1300.00	\$300.00		2600	600	3200		
c. Disconnect Switch	4 EA	\$800.00	\$200.00		3200	800	4000		
d. Transformer	1 EA	\$1200.00	\$500.00		1200	500	1700		
e. Conduit,Cable,Control	16 EA	\$455.00	\$680.00		7280	10880	18160		
f. Grounding/Wiring	2 LOT	\$6000.00	\$6000.00		12000	12000	24000		
Total					111000	231615	5798	1081803	
Subcontractor @ 10% of Sub. Cost					11100			11100	
Burden @ 13% of Labor Cost						30110		30110	
Labor @ 15% of Labor Cost						34742		34742	
Material @ 5% of Material Cost						36670		36670	
Total Direct Costs (TDC)					122100	77060		1194425	
Indirects 75% of Labor TDC						222350		222350	
Profit @ 10% of TDC								119442	
Total					122100	77060	518818	1536218	
Mortgage Level: D= .15								77823	
Health & Safety Monitoring @ .06								129123	
Total								1743163	
Total Field Cost (TFC)								348633	
Contingency @ 20% of TFC								87158	
Engineering @ 5% of TFC									
CAPITAL COST THIS PAGE								2178954	

45

ORIGINAL
(red)

MILLCREEK
Groundwater Wells
Installation
(HILLGRIFF)

ITEM	QUANTITY	DIRECT UNIT PRICE			DIRECT UNIT COST			ITEM DIRECT COST	COMMENTS
		MATERIALS	LABOR	EQUIPMENT	MATERIALS	LABOR	EQUIPMENT		
Pumps	23	EA	\$1500.00 (Total Unit \$)				34500		
Extraction Wells	240	LF	\$60.00 (Total Unit \$)				14400		
Injection Wells	200	LF	\$40.00 (Total Unit \$)				8000		
Piping	4500	LF	\$8.50 (Total Unit \$)				38250		
Total							95150		
Subcontractor @ 10% of Sub. Cost							9515		
Burden @ 13% of Labor Cost							0		
Labor @ 15% of Labor Cost							0		
Material @ 5% of Material Cost							0		
Total Direct Costs (IDC)							104665		
Indirects 75% of Labor IDC							0		
Profit @ 10% of IDC							10467		
Total							115132		
Working level: C, D = .35							0		
Health & Safety Monitoring @ .08							11513		
Total Field Cost (TFC)							126645		
Contingency @ 20% of TFC							25329		
Engineering @ 5% of TFC							6332		
CAPITAL COST THIS PAGE							198306		

AR000746

SITE: HILLCREEK
 ALTERNATIVE NO.: 4
 7460

PRESENT WORTH ANALYSIS

COST COMPONENT	COST/YEAR COST OCCURS (\$000's)											
	0	1	2	3	4	5	6	7	8	9	10	11
1. CAPITAL COSTS	5016											
2. O & M COSTS	---	605	605	181	181	181	181	181	181	181	181	181
3. ANNUAL COSTS	5016	0.909	0.826	0.751	0.683	0.621	0.564	0.513	0.467	0.424	0.386	0.35
4. ANNUAL DISCOUNT RATE=10%	1											
PRESENT WORTH =	5016	550	500	136	124	113	102	93	85	77	70	63

O & M COSTS	181	181	181	181	181	181	181	181	181	181	181	181
ANNUAL DISCOUNT RATE=10%	0.319	0.29	0.263	0.239	0.218	0.198	0.18	0.164	0.149	0.135	0.123	0.112
PRESENT WORTH =	58	53	48	43	40	36	33	30	27	24	22	20

O & M COSTS	181	181	181	181	181	181	181	181	181	181	181	181
ANNUAL DISCOUNT RATE=10%	0.101	0.092	0.084	0.076	0.069	0.063	0.057					
PRESENT WORTH =	18	17	15	14	13	11	10					

TOTAL PRESENT WORTH (\$000's)	7460											

ORIGINAL
 (red)

AR000747

REMEDIAL ACTION ALTERNATIVE #

SUMMARY OF SENSITIVITY ANALYSIS

(COST IN THOUSANDS)

COST FACTOR	BASELINE COST	SENSITIVITY FACTOR EXAMINED RESULTS			
		LOW	HIGH		
CAPITAL COSTS (\$):	5,016	4,180	6,161		
PRESENT WORTH (\$):	7,460	6,624	8,605		
	1	605	605	605	
	2	605	605	605	
	3	181	181	181	
	4				
	5				
	6				
	7				
	8				
	9				
	10				
	11				
	12				
	13				
	14				
	15				
ANNUAL COSTS Year 5	16				
	17				
	18				
	19				
	20				
	21				
	22				
	23				
	24				
	25				
	26				
	27				
	28				
	29				
	30				

ORIGINAL

(red)

AR000748

ORIGINAL DRAFT
(red)

REMEDIAL ACTION ALTERNATIVE 5

AR000749

ORIGINAL
(red)

MILLCREEK
Onsite Landfill Cover
Alternative 5 & 6
(MILLERCL)

ITEM	QUANTITY	DIRECT UNIT PRICE			DIRECT UNIT COST			ITEM DIRECT COST	COMMENTS
		MATERIALS	LABOR	EQUIPMENT	SUB.	MATERIALS	LABOR		
Topsoil- 6 in.	2800 CY	\$5.50	\$1.20	\$2.83		15400	3360	7924	26684
Soil- 18 in.	5700 CY	\$1.50	\$1.20	\$2.83		8550	6040	16131	31521
Filter Fabric	22800 SY	\$1.00	\$0.20			22800	4560		27360
Gravel- 12 in.	3800 CY	\$10.00	\$1.20	\$2.83		38000	4560	10754	53314
50 Mil Membrane	102400 SF	\$0.50	\$0.20		71680				71680
Clay- 24 in.	7590 CY	\$9.00	\$3.76	\$7.47		68310	28538	56697	153546
Perf. PVC Pipe-4 in.	1200 LF	\$0.65	\$1.32			780	1584		2364
Total					71680	153840	49442	91506	366469
Subcontractor @ 10% of Sub. Cost					7168				7168
Burden @ 13% of Labor Cost							6428		6428
Labor @ 15% of Labor Cost							7416		7416
Material @ 5% of Material Cost						7692			7692
Total Direct Costs (IDC)					78848	161532	63286	91506	395173
Indirects 75% of Labor IDC							47465		47465
Profit @ 10% of IDC									39517
Total					78848	161532	110751	91506	482155
Working Level: C.D.=.35									70790
Health & Safety Monitoring @ .08									44236
Total Field Cost (TFC)									597180
Contingency @ 20% of TFC.									119436
Engineering @ 5% of TFC									29859
CAPITAL COST THIS PAGE									746475

AR000750

ORIGINAL

(red)

MILCREEK
Excavation-Alternatives 5 & 6
(Onsite Disposal)
(MILLEXCA)

ITEM	QUANTITY	DIRECT UNIT PRICE			SUB.	DIRECT UNIT COST			ITEM DIRECT COST	COMMENTS
		MATERIALS	LABOR	EQUIPMENT		MATERIALS	LABOR	EQUIPMENT		
Excavation - Dragline	12700	CY	\$1.67	\$2.58		0	21209	32766	53975	Southeast corner
Excavation	8100	CY	\$1.67	\$2.58		0	13527	20898	34425	Erosion control bench
Excavation	450	CY	\$2.30	\$3.26		0	1035	1467	2502	Sediments from drained pond.
Bredge Swamp - Dragline	6200	CY	\$4.19	\$5.05		0	25978	31310	57286	
Backfill Swamp	6200	CY	\$1.50	\$1.20		9300	7440	17546	34286	
Silt Fences	4100	LF	\$2.25	\$0.16		9225	656	0	9881	
Rehandle Dewatered Excav.	19000	CY	\$0.96	\$2.26		0	18240	42940	61180	
Total					0	18525	88085	146927	253537	
Subcontractor @ 10% of Sub. Cost					0				0	
Burden @ 13% of Labor Cost							11451		11451	
Labor @ 15% of Labor Cost							13213		13213	
Material @ 5% of Material Cost						926			926	
Total Direct Costs (TDC)					0	19451	112749	146927	279127	
Indirects 75% of Labor TDC							84562		84562	
Profit @ 10% of TDC									27913	
Total					0	19451	197310	146927	391601	
Working Level: C=-.7									240966	
Health & Safety Monitoring @ .10									63257	
Total Field Cost (TFC)									695824	
Contingency @ 20% of TFC									139165	
Engineering @ 5% of TFC									34791	
CAPITAL COSTS THIS PAGE									869780	

AR000751

MILLCREEK
 Selective Soil Cover
 Alternative 5
 (MILLSBORO)

ITEM	QUANTITY	DIRECT UNIT PRICE			DIRECT UNIT COST			ITEM DIRECT COST	COMMENTS
		MATERIALS	LABOR	EQUIPMENT	MATERIALS	LABOR	EQUIPMENT		
Clear & Grub	43	AC	\$1010.00	\$1280.00	0	43430	56040	98470	
Grade	46300	CY	\$0.66	\$3.11	0	30558	143993	174551	
Topsoil- 6 in.	33100	CY	\$5.50	\$2.83	182050	39720	93673	315443	
Soil- 18 in.	99300	CY	\$1.50	\$2.83	148950	119160	281019	549129	
Chain Link Fence- 6 ft.	8400	LF	\$9.65	(Total Unit \$)	81060			81060	
Revegetation	1870	NSF	\$24.60	\$4.45	46002	10472	8322	64796	
Total					81060	243340	582047	1283449	
Subcontractor @ 10% of Sub. Cost					8106			8106	
Burden @ 13% of Labor Cost						31634		31634	
Labor @ 15% of Labor Cost						36501		36501	
Material @ 5% of Material Cost					18850			18850	
Total Direct Costs (TDC)					89166	395852	582047	1378540	
Indirects 75% of Labor TDC						233606		233606	
Profit @ 10% of TDC								137654	
Total					89166	395852	582047	1750000	
Working Level: C.D.= .35								394495	
Health & Safety Monitoring @ .08								171560	
Total Field Cost (TFC)								2316055	
Contingency @ 20% of TFC								463211	
Engineering @ 5% of TFC								115803	
CAPITAL COST THIS PAGE								2895068	

ORIGINAL
 (red)

AR000752

MILLCREK
 RCRA Liner System/Partial
 Alternative 5 & 6
 (MILLERS)

ITEM	QUANTITY	DIRECT UNIT PRICE			DIRECT UNIT COST			ITEM COST	COMMENTS	
		MATERIALS	LABOR	EQUIPMENT	MATERIALS	LABOR	EQUIPMENT			
Gravel- 24 in.	6800	CY	\$10.00	\$1.20	\$2.83	68000	8160	19244	95404	1. Quantities inclusive of leachate collection and detection zone.
Clay- 24 in.	6800	CY	\$9.00	\$3.76	\$7.47	61200	25560	50796	137564	
Filter Fabric	41200	SY	\$1.00	\$0.20		41200	8240	0	49440	
50 Mil Membrane	92700	SF	\$0.50	\$0.20		64890			64890	
30 Mil Membrane	92700	SF	\$0.30	\$0.20		46350			46350	
Perf. PVC Pipe-6 in. dia.	1200	LF	\$1.45	\$1.41		1740	1692	0	3432	
Embankments	21700	CY	\$9.00	\$3.76	\$7.47	195300	81592	162099	438991	
Total						367440	125252	232139	836071	
Subcontractor @ 10% of Sub. Cost						11124			11124	
Burden @ 13% of Labor Cost							16283		16283	
Labor @ 15% of Labor Cost							18788		18788	
Material @ 5% of Material Cost						18372			18372	
Total Direct Costs (TDC)						122364	385812	232139	900638	
Indirects 7.5% of labor TDC							120242		120242	
Profit @ 10% of TDC									90064	
Total						122364	385812	232139	1110943	
Working level: C,D=.35									179446	
Health & Safety Monitoring @ .10									129039	
Total Field Cost (TFC)									1419428	
Contingency @ 20% of TFC									283886	
Engineering @ 5% of TFC									70971	
CAPITAL COST THIS PAGE									1774285	

ORIGINAL
 (red)

AR000753

MILLCREEK
 Stormwater Management System
 Alternative 5,6,7,8,9 & 10
 (MILLSMS2)

ITEM	QUANTITY	DIRECT UNIT PRICE			DIRECT UNIT COST			ITEM DIRECT COST	COMMENTS	
		MATERIALS	LABOR	EQUIPMENT	SUB.	MATERIALS	LABOR			EQUIPMENT
Excavation	22900	CY	\$1.67	\$7.47		0	38243	59082	97325	
Clay- 2 ft.	7900	CY	\$3.76	\$7.47		71100	29704	59013	159817	
30 Mil Membrane	106000	SF	\$0.30	\$0.20		31800	21200	0	53000	
Sand/Gravel- 1 ft.	3900	CY	\$10.00	\$1.20	\$2.83	39000	4680	11037	54717	
Stone- 1 ft.	3900	CY	\$10.00	\$1.20	\$2.83	39000	4680	11037	54717	
Embankments	3120	CY	\$9.00	\$3.76	\$7.47	28080	11731	23306	63118	
Concrete Pipe- 15 in.	120	LF	\$6.20	\$3.12	\$0.48	744	374	58	1176	
Sheet Piling	280	SF	\$6.40	\$1.29	\$1.49	1792	361	417	2570	
Weir	4	EA	\$1000.00	\$500.00		4000	2000	0	6000	
Stone Riprap	280	CY	\$7.50	\$4.87	\$4.93	2100	1364	1380	4844	
Silt Fences	2300	LF	\$2.20	\$2.40	\$0.96	5060	5520	2208	12788	
Total						0	222676	119857	167539	510072
Subcontractor @ 10% of Sub. Cost						0			0	
Burden @ 13% of Labor Cost							15581		15581	
Labor @ 15% of Labor Cost							17979		17979	
Material @ 5% of Material Cost							11134		11134	
Total Direct Costs (TDC)						0	233810	153417	167539	554766
Indirects 75% of Labor TDC							115063		115063	
Profit @ 10% of TDC							55477		55477	
Total						0	233810	268481	167539	725306
Working level: D=.15									65403	
Health & Safety Monitoring @ .08									63257	
Total Field Cost (TFC)									853965	
Contingency @ 20% of TFC									170793	
Engineering @ 5% of TFC									42698	
CAPITAL COST THIS PAGE									1067456	

ORIGINAL
 (red)

AR000754

MILLCREEK
Stormwater Management System Dewatering
Alternative 5.6,7,8 & 9
(MILLDEW)

ITEM	QUANTITY	DIRECT UNIT PRICE			DIRECT UNIT COST			ITEM DIRECT COST	COMMENTS
		MATERIALS	LABOR	EQUIPMENT	MATERIALS	LABOR	EQUIPMENT		
Dewatering Wells	35								
Boring	700	LF	\$40.00 (total unit \$)		28000			28000	35 wells @ 20' ea.
Well Screen	140	LF	\$8.00 (total unit \$)		1120			1120	Two stormwater ponds will be constructed at a time. Therefore, some material will be used twice.
Install Well Screen	350	LF	\$5.00 (total unit \$)		1750			1750	
Gravel Pack- 8.72 cf/well	305	CF	\$4.00 (total unit \$)		1220			1220	
PVC Riser- 6 in.	140	LF	\$8.00 (total unit \$)		1120			1120	
Install PVC Riser	350	LF	\$4.00 (total unit \$)		1400			1400	
Pipe Manifold & Conductor	1000	LF	\$10.00 (total unit \$)		10000			10000	
Electric Cable	2000	LF	\$6.00 (total unit \$)		12000			12000	
Install & Pull Pumps	35	EA	\$700.00 (total unit \$)		24500			24500	
Pull Wells	35	EA	\$5.00 (total unit \$)		175			175	
Plug Wells	175	CF	\$30.00 (total unit \$)		5250			5250	
Mob/Demob			\$5000.00 (total unit \$)		5000			5000	
Total					91535	0	0	91535	
Subcontractor @ 10% of Sub. Cost					9154			9154	
Burden @ 13% of Labor Cost					0			0	
Labor @ 15% of Labor Cost					0			0	
Material @ 5% of Material Cost					0			0	
Total Direct Costs (TDC)					100689	0	0	100689	
Indirects 75% of Labor TDC					0			0	
Profit @ 10% of TDC					0			0	
Total					100689	0	0	110757	
Working Level: D=.15								0	
Health & Safety Monitoring @ .10								11076	
Total Field Cost (TFC)								121833	
Contingency @ 20% of TFC								24367	
Engineering @ 10% of TFC								12183	
CAPITAL COST THIS PAGE								156383	

ORIGINAL
(red)

AR000755

ORIGINAL
(red)

MILLCREEK
Dewatering Area
Alternative 5, 6, 7, 8 & 9, 11
(HILLDEWAT)

ITEM	QUANTITY	DIRECT UNIT PRICE			DIRECT UNIT COST			ITEM COST	COMMENTS
		MATERIALS	LABOR	EQUIPMENT	MATERIALS	LABOR	EQUIPMENT		
Dewatering Pad									
Excavation	5100	CY	\$1.20	\$2.83	0	6120	14433	20553	
Sand	1680	CY	\$1.20	\$2.83	10920	2016	4754	17690	
30 Mil Membrane	45160	SF	\$0.30	\$0.20	13530	9020	0	22550	
Slag	1680	CY	\$1.50	\$2.83	2520	2016	4754	9290	
Construction Water Basin									
Excavation	1300	CY	\$1.20	\$2.83	0	1560	3679	5239	
Clay	400	CY	\$3.76	\$7.47	3600	1504	2988	8092	
30 Mil Membrane	5400	SF	\$0.30	\$0.20	1620	1080	0	2700	
Sand/Gravel	300	CY	\$6.50	\$1.20	1950	360	849	3159	
Silt Fences	450	LF	\$2.25	\$0.16	1013	72	0	1085	
Total					0	35153	23748	31458	90358
Subcontractor @ 10% of Sub. Cost					0				0
Burden @ 13% of Labor Cost							3087		3087
Labor @ 15% of Labor Cost							3562		3562
Material @ 5% of Material Cost						1758			1758
Total Direct Costs (TDC)					0	36910	30397	31458	98765
Indirects 75% of Labor TDC							22798		22798
Profit @ 10% of TDC									9877
Total					0	36910	53196	31458	131440
Working Level: C, D = .35									29629
Health & Safety Monitoring @ .10									16107
Total Field Cost (TFC)									177176
Contingency @ 20% of TFC									35435
Engineering @ 5% of TFC									8859
CAPITAL COST THIS PAGE									221469

AR000756

ORIGINAL

(red)

MILLER
Groundwater Wells
Installation
(MILLER11)

ITEM	QUANTITY	DIRECT UNIT PRICE			DIRECT UNIT COST			ITEM DIRECT COST	COMMENTS
		MATERIALS	LABOR	EQUIPMENT	MATERIALS	LABOR	EQUIPMENT		
Pumps	23	IA							
Extraction Wells	240	IF	\$1500.00 (Total Unit \$)				345000	345000	
Injection Wells	200	IF	\$60.00 (Total Unit \$)				14400	14400	
Piping	4500	IF	\$40.00 (Total Unit \$)				8000	8000	
		IF	\$0.50 (Total Unit \$)				38250	38250	
Total							95150	95150	
Subcontractor @ 10% of Sub. Cost							9515	9515	
Burden @ 1% of Labor Cost							0	0	
Labor @ 15% of Labor Cost							0	0	
Material @ 5% of Material Cost							0	0	
Total Project Costs (DPC)							104665	104665	
Indirects - 7% of Labor DPC							0	0	
Profit @ 10% of DPC							10467	10467	
Total							104665	104665	
Monitoring Level: C.D. .35							0	0	
Health & Safety Monitoring @ .08							11513	11513	
Total Field Cost (TFC)							126645	126645	
Contingency @ 20% of TFC							25329	25329	
Engineering @ 5% of TFC							6332	6332	
CAPITAL COST THIS PAGE							158306	158306	

AR000757

SUMMARY OF SENSITIVITY ANALYSIS

(COST IN THOUSANDS)

	BASELINE COST	SENSITIVITY FACTOR EXAMINED RESULTS		
		LOW	HIGH	
CAPITAL COSTS (\$):	10,287	8,844	12,160	
PRESENT WORTH (\$):	12,849	11,405	14,722	
ANNUAL COSTS (Year's)	1	617	617	617
	2	617	617	617
	3	194	194	194
	4			
	5			
	6			
	7			
	8			
	9			
	10			
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	28			
				AR000759

(pd)

ORIGINAL

DRAFT

REMEDIAL ACTION ALTERNATIVE 6

(red)

ORIGINAL

AR000760

ORIGINAL

HILLCREEK
Excavation-Alternatives 5 & 6
Onsite Disposal
(MILLEXCA)

(Red)

ITEM	QUANTITY	DIRECT UNIT PRICE			DIRECT UNIT COST			ITEM DIRECT COST	COMMENTS
		MATERIALS	LABOR	EQUIPMENT	SUB.	MATERIALS	LABOR		
Excavation - Dragline	12700	CY	\$1.67	\$2.58	0	21209	32766	53975	Southeast corner
Excavation	8100	CY	\$1.67	\$2.58	0	13527	20898	34425	Erosion control bench
Excavation	450	CY	\$2.30	\$3.26	0	1035	1467	2502	Sediments from drained pond.
Bredge Swamp - Dragline	6200	CY	\$4.19	\$5.05	0	25978	31310	57288	
Backfill Swamp	6200	CY	\$1.50	\$2.83	9300	7440	17546	34286	
Still Fences	4100	LF	\$2.25	\$0.16	9225	656	0	9881	
Rehandle Dewatered Excav.	19000	CY	\$0.96	\$2.26	0	18240	42940	61180	
Total					0	88085	146927	253537	
Subcontractor @ 10% of Sub. Cost					0			0	
Burden @ 13% of Labor Cost						11451		11451	
Labor @ 15% of Labor Cost						13213		13213	
Material @ 5% of Material Cost					926			926	
Total Direct Costs (TDC)					0	19451	146927	279127	
Indirects 75% of Labor TDC						84562		84562	
Profit @ 10% of TDC								27913	
Total					0	19451	146927	391601	
Working Level: C=.7								240966	
Health & Safety Monitoring @ .10								63257	
Total Field Cost (TFC)								695824	
Contingency @ 20% of TFC								139165	
Engineering @ 5% of TFC								34791	
CAPITAL COSTS THIS PAGE								869780	

AR000761

ORIGINAL

NIHILPEK
 PCOR Liner System/Partial
 Alternative 5 & 6
 QUANTITIES

(red)

ITEM	QUANTITY	DIRECT UNIT PRICE			DIRECT UNIT COST			ITEM DIRECT COST	COMMENTS	
		MATERIALS	LABOR	EQUIPMENT	MATERIALS	LABOR	EQUIPMENT			
Gravel- 24 in.	6800	CY	\$10.00	\$1.20	\$2.83	60000	8160	19244	95404	1. Quantities inclusive of leachate collection and detection zone.
Clay- 24 in.	6800	CY	\$9.00	\$3.76	\$7.47	61200	25560	50796	137564	
Filter Fabric	41280	SF	\$1.00	\$0.20		41200	8240	0	49440	
50 Mil Membrane	92700	SF	\$0.50	\$0.20		64890			64890	
30 Mil Membrane	92700	SF	\$0.30	\$0.20		46350			46350	
Perf. PVC Pipe-6 in. dia.	1200	LF	\$1.45	\$1.41		1740	1692	0	3432	
Embarkments	21700	CY	\$9.00	\$3.76	\$7.47	195300	81592	162099	438991	
Total						111240	367440	232139	836071	
Subcontractor @ 10% of Sub. Cost						11124			11124	
Burden @ 13% of Labor Cost							16283		16283	
Labor @ 15% of Labor Cost							18780		18788	
Material @ 5% of Material Cost							18372		18372	
Total Direct Costs (TDC)						122364	385812	232139	900638	
Indirects - 75% of Labor TDC							120242		120242	
Profit @ 10% of TDC									90064	
Total						122364	305812	232139	1110943	
Monitoring Level: C, D, 35									179446	
Health & Safety Monitoring @ .10									129039	
Total Field Cost (IFC)									1419428	
Contingency @ 20% of IFC									283886	
Engineering @ 5% of IFC									70971	
CAPITAL COST THIS PAGE									1774285	

AR000762

ORIGINAL

MILLER
Groundwater Wells
Installation
(HILLGARDEN)

(Red)

ITEM	QUANTITY	DIRECT UNIT PRICE			DIRECT UNIT COST			ITEM DIRCT COST	COMMENTS
		MATERIALS	LABOR	EQUIPMENT	MATERIALS	LABOR	EQUIPMENT		
Pumps	23	EA	\$1500.00	(Total Unit \$)	34500			34500	
Extraction Wells	240	IF	\$60.00	(Total Unit \$)	14400			14400	
Injection Wells	200	IF	\$40.00	(Total Unit \$)	8000			8000	
Piping	4500	LF	\$8.50	(Total Unit \$)	38250			38250	
Total					95150			95150	
Subcontractor @ 10% of Sub. Cost					9515			9515	
Bonding @ 1.5% of Labor Cost					0			0	
Labor @ 15% of Labor Cost					0			0	
Material @ 5% of Material Cost					0			0	
Total Direct Costs (TDC)					104665			104665	
Indirects 75% of Labor TDC					0			0	
Profit @ 10% of TDC					0			0	
Total					104665			104665	
Monitoring Level: C.D. .35					0			0	
Health & Safety Monitoring @ .08					0			0	
Total Field Cost (TFC)					115132			115132	
Contingency @ 20% of TFC					0			0	
Engineering @ 5% of TFC					11513			11513	
CAPITAL COST THIS PAGE					126645			126645	
					25329			25329	
					6337			6337	
					158306			158306	

AR000763

ORIGINAL

MILLCREEK
Onsite Landfill Cover
Alternative 5 & 6
(MILLCREEK)

(red)

ITEM	QUANTITY	DIRECT UNIT PRICE			DIRECT UNIT COST			ITEM DIRECT COST	COMMENTS
		MATERIALS	LABOR	EQUIPMENT	MATERIALS	LABOR	EQUIPMENT		
Topsoil- 6 in.	2800	CY	\$5.50	\$1.20	\$2.83	15400	3360	7924	26684
Soil- 18 in.	5700	CY	\$1.50	\$1.20	\$2.83	8550	6040	16131	31521
Filter Fabric	22800	SY	\$1.00	\$0.20		22800	4560		27360
Gravel- 12 in.	3800	CY	\$10.00	\$1.20	\$2.83	38000	4560	10754	53314
50 Mil Membrane	102400	SF	\$0.50	\$0.20					71680
Clay- 24 in.	7590	CY	\$9.00	\$3.76	\$7.47	68310	28538	56697	153546
Perf. PVC Pipe-4 in.	1200	LF	\$0.65	\$1.32		780	1584		2364
Total						71680	153840	91506	366469
Subcontractor @ 10% of Sub. Cost						7168			7168
Burden @ 13% of Labor Cost							6428		6428
Labor @ 15% of Labor Cost							7416		7416
Material @ 5% of Material Cost							7692		7692
Total Direct Costs (TDC)						78848	161532	91506	395173
Indirects 75% of Labor TDC							47465		47465
Profit @ 10% of TDC							39517		39517
Total						78848	161532	91506	482155
Working Level: C.O.=.35									70790
Health & Safety Monitoring @ .08									44236
Total Field Cost (TFC)									597180
Contingency @ 20% of TFC									119436
Engineering @ 5% of TFC									29859
CAPITAL COST THIS PAGE									746475

AR000764

ORIGINAL

MILICRUK
Stormwater Management System
Alternative 5, 6, 7, 8, 9 & 10
(MIL-MS2)

(red)

ITEM	QUANTITY	DIRECT UNIT PRICE			DIRECT UNIT COST			ITEM DIRECT COST	COMMENTS
		MATERIALS	LABOR	EQUIPMENT	MATERIALS	LABOR	EQUIPMENT		
Excavation	22900	CY	\$1.67	\$2.58		38243	59082	97325	
Clay- 2 ft.	7900	CY	\$3.76	\$7.47		29704	59013	159817	
30 Hit Embriane	106000	SF	\$0.30	\$0.20		31800	0	53600	
Sand/Gravel- 1 ft.	3900	CY	\$10.00	\$2.83		39000	11037	54717	
Stone- 1 ft.	3900	CY	\$10.00	\$2.83		39000	11037	54717	3-8 in. diameter
Embanchments	3120	CY	\$9.00	\$7.47		28080	23306	63110	
Concrete Pipe- 15 in.	120	LF	\$6.20	\$0.48		744	58	1176	
Sheet Piling	280	SF	\$6.40	\$1.49		1792	417	2570	
Metr	4	EA	\$1000.00	\$500.00		4000	0	6000	
Stone Riprap	280	CY	\$7.50	\$4.87		2100	1380	4844	
Slit Fences	2300	LF	\$2.20	\$0.96		5060	2208	12708	
Total			0			222676	167539	510072	
Subcontractor @ 10% of Sub. Cost			0			0		0	
Burden @ 13% of Labor Cost						15581		15581	
Labor @ 15% of Labor Cost						17979		17979	
Material @ 5% of Material Cost						11134		11134	
Total Direct Costs (TDC)			0			233810	167539	554766	
Indirects 75% of Labor TDC						115063		115063	
Profit @ 10% of TDC								55477	
Total			0			233810	167539	725306	
Monitoring level: D= .15								65403	
Health & Safety Monitoring @ .08								63257	
Total Field Cost (IFC)								853965	
Contingency @ 20% of IFC								170793	
Engineering @ 5% of IFC								42698	
CAPITAL COST THIS PAGE								1067456	

AR000765

ORIGINAL

(red)

MILLCREEK
 Stormwater Management System Privatizing
 Alternative 5, 6, 7, 8 & 9
 (MILLCREEK)

ITEM	QUANTITY	DIRECT UNIT PRICE			DIRECT UNIT COST			ITEM DIRECT COST	COMMENTS
		MATERIALS	LABOR	EQUIPMENT	MATERIALS	LABOR	EQUIPMENT		
Dewatering Wells	35								
Boring	700	LF	\$40.00 (total unit \$)		28000			28000	35 wells @ 20' ea.
Well Screen	140	LF	\$8.00 (total unit \$)		1120			1120	Two stormwater ponds
Install Well Screen	350	LF	\$5.00 (total unit \$)		1750			1750	will be constructed
Gravel Pack - 8.72 cf/well	305	CF	\$4.00 (total unit \$)		1220			1220	at a time. Therefore,
PVC Riser - 6 in.	140	LF	\$8.00 (total unit \$)		1120			1120	some material will be
Install PVC Riser	350	LF	\$4.00 (total unit \$)		1400			1400	used twice.
Pipe Manifold & Conductor	1000	LF	\$10.00 (total unit \$)		10000			10000	
Electric Cable	2000	LF	\$6.00 (total unit \$)		12000			12000	
Install & Pull Pumps	35	EA	\$700.00 (total unit \$)		24500			24500	
Pull Wells	35	EA	\$5.00 (total unit \$)		175			175	
Plug Wells	175	CF	\$30.00 (total unit \$)		5250			5250	
Mob/Demob			\$5000.00 (total unit \$)		5000			5000	
Total					91535	0	0	91535	
Subcontractor @ 10% of Sub. Cost					9154			9154	
Burden @ 13% of Labor Cost					0			0	
Labor @ 15% of Labor Cost					0			0	
Material @ 5% of Material Cost					0			0	
Total Direct Costs (TDC)					100689	0	0	100689	
Indirects 75% of Labor TDC					0			0	
Profit @ 10% of TDC					10069			10069	
Total					100689	0	0	110757	
Working Level: D=.15					0			0	
Health & Safety Monitoring @ .10					11076			11076	
Total Field Cost (TFC)									
Contingency @ 20% of TFC					121833			121833	
Engineering @ 10% of TFC					24367			24367	
					12183			12183	
CAPITAL COST THIS PAGE								158363	

AR000766

ORIGINAL

MILLCREEK
 Dewatering Area
 Alternative 5, 6, 8 & 9. a
 (MILLBURN)

ITEM	QUANTITY	DIRECT UNIT PRICE			DIRECT UNIT COST			ITEM DIRECT COST	CONVERTS
		MATERIALS	LABOR	EQUIPMENT	MATERIALS	LABOR	EQUIPMENT		
Dewatering Pad									
Excavation	5100		\$1.20	\$2.83	0	6120	14433	20553	
Sand	1680	\$6.50	\$1.20	\$2.83	10920	2016	4754	17690	
30 Mil Membrane	45100	\$0.30	\$0.20		13530	9020	0	22550	
Slag	1680	\$1.50	\$1.20	\$2.83	2520	2016	4754	9290	
Construction Water Basin									
Excavation	1300		\$1.20	\$2.83	0	1560	3679	5239	
Clay	400	\$9.00	\$3.76	\$7.47	3600	1504	2988	8092	
30 Mil Membrane	5400	\$0.30	\$0.20		1620	1080	0	2700	
Sand/Gravel	300	\$6.50	\$1.20	\$2.83	1950	360	849	3159	
Silt fences	450	\$2.25	\$0.16		1013	72	0	1085	
Total					0	35153	23748	31458	90358
Subcontractor @ 10% of Sub. Cost					0				0
Burden @ 13% of Labor Cost							3087		3087
Fabric @ 15% of Labor Cost							3562		3562
Material @ 5% of Material Cost					1758				1758
Total Direct Costs (TDC)					0	36910	30397	31458	98765
Indirects 75% of Labor TDC							22798		22798
Profit @ 10% of TDC									9877
Total					0	36910	53196	31458	131440
Working level: C.D.=.35									29629
Health & Safety Monitoring @ .10									16107
Total Field Cost (TFC)									177176
Contingency @ 20% of TFC									35435
Engineering @ 5% of TFC									8859
CAPITAL COST THIS PAGE									221469

AR000767

ORIGINAL

SITE: MILLCREEK
 ALTERNATIVE NO.: 6
 23220

PRESENT WORTH ANALYSIS

COST COMPONENT	COST/YEAR COST OCCURS (\$000's)											
	0	1	2	3	4	5	6	7	8	9	10	11
1. CAPITAL COSTS	20658											
2. O & H COSTS		617										
3. ANNUAL COSTS	20658	617	617	194	194	194	194	194	194	194	194	194
4. ANNUAL DISCOUNT RATE=10%	1	0.909	0.826	0.751	0.683	0.621	0.564	0.513	0.467	0.424	0.386	0.35
PRESENT WORTH =	20658	561	510	146	132	120	109	99	91	82	75	68

12	13	14	15	16	17	18	19	20	21	22	23
194	194	194	194	194	194	194	194	194	194	194	194
0.319	0.29	0.263	0.239	0.218	0.198	0.18	0.164	0.149	0.135	0.123	0.112
PRESENT WORTH =	62	56	51	46	42	38	35	32	29	26	24

COST COMPONENT	COST/YEAR COST OCCURS (\$000's)											
	0	1	2	3	4	5	6	7	8	9	10	11
1. CAPITAL COSTS	20658											
2. O & H COSTS		617										
3. ANNUAL COSTS	20658	617	617	194	194	194	194	194	194	194	194	194
4. ANNUAL DISCOUNT RATE=10%	1	0.909	0.826	0.751	0.683	0.621	0.564	0.513	0.467	0.424	0.386	0.35
PRESENT WORTH =	20658	561	510	146	132	120	109	99	91	82	75	68

AR000768

SUMMARY OF SENSITIVITY ANALYSIS

(COST IN THOUSANDS)

COST FACTOR	BASELINE COST	SENSITIVITY FACTOR EXAMINED RESULTS		
		LOW	HIGH	ORIGINAL
CAPITAL COSTS (\$):	20,658	18,178	23,571	(red)
PRESENT WORTH (\$):	23220	20740	26,133	
ANNUAL COSTS (Year's)	1	617	617	617
	2	617	617	617
	3	194	194	194
	4			
	5			
	6			
	7			
	8			
	9			
	10			
	11			
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AR000769

DRAFT

REMEDIAL ACTION ALTERNATIVE 7

(red)
ORIGINAL

AR000770

MILLCREEK
Excavation-Alternatives 7
Offsite Disposal
(MILLX7)

ORIGINAL

ITEM	QUANTITY	DIRECT UNIT PRICE			DIRECT UNIT COST			ITEM DIRECT COST	COMMENTS
		MATERIALS	LABOR	EQUIPMENT	MATERIALS	LABOR	EQUIPMENT		
Excavation	12700	CY	\$1.67	\$2.58	0	21209	32766	53975	Southeast corner
Excavation	8100	CY	\$1.67	\$2.58	0	13527	20898	34425	Eroston control bench
Excavation	450		\$2.30	\$3.26	0	1035	1467	2502	Sediments from drained pond.
Dredge Swamp	6200	CY	\$4.19	\$5.05	0	25978	31310	57288	
Backfill Swamp	6200	CY	\$1.50	\$1.20	\$2.83	9300	17546	34286	
Silt fences	4100	LF	\$2.25	\$0.16		656	0	9881	
Transportation	171600	LH	\$4.00 / LM	(Total Unit \$)	686400			686400	CECOS-125 miles one way
Disposal	22000	T	\$110.00 / ton	(Total Unit \$)	2420000			2420000	
Total					3106400	69845	103987	3298757	
Subcontractor @ 10% of Sub. Cost					310640			310640	
Burden @ 13% of Labor Cost						9080		9080	
Labor @ 15% of Labor Cost						10477		10477	
Material @ 5% of Material Cost						926		926	
Total Direct Costs (TDC)					3417040	89402	103987	3629880	
Indirects 75% of Labor TDC						67051		67051	
Profit @ 10% of TDC								362988	
Total					3417040	156453	103987	4059919	
Working Level: C=.7								182308	
Health & Safety Monitoring @ .06								254534	
Total Field Cost (TFC)								4496761	
Contingency @ 20% of TFC								899352	
Engineering @ 5% of TFC								224838	
CAPITAL COST THIS PAGE								5620951	

AR000771

ORIGINAL

(red)

HILLCREEK
Soil/Membrane/Clay
Alternative 6 & 7
(MILTRC)

ITEM	QUANTITY	DIRECT UNIT PRICE			DIRECT UNIT COST			DIRECT COST	COMMENTS
		MATERIALS	LABOR	EQUIPMENT	MATERIALS	LABOR	EQUIPMENT		
Clear & Grub	43	AC	\$1010.00	\$1280.00	0	43430	55040	98470	
Grade	46300	CY	\$1.40	\$1.24	0	64820	57412	122232	
Topsoil - 6 in.	33100	CY	\$5.50	\$2.83	182050	39720	93673	315443	
Soil - 18 in.	99300	CY	\$1.50	\$2.83	148950	119160	281019	549129	2. Common borrow
Filter Fabric	396900	SY	\$1.00	\$0.20	396900	79380		476280	
Gravel - 12 in.	66280	CY	\$10.00	\$2.83	662600	79440	187346	928786	
50 Mil Membrane	1786000	SF	\$0.50	\$0.20	1190700	497448	988281	1250200	
Clay - 24 in.	132300	CY	\$9.00	\$7.47	81060	10472	8322	2676429	
Chain Link Fence	8400	LF	\$9.65	(Total Unit \$)				81060	
Revegetation	1870	MSF	\$24.60	\$4.45	46002			64796	
Total					1331260	933870	1671093	6562825	
Subcontractor @ 10% of Sub. Cost					133126			133126	
Burden @ 13% of Labor Cost						121403		121403	
Labor @ 15% of Labor Cost						140081		140081	
Material @ 5% of Material Cost					131330			131330	
Total Direct Costs (IDC)					1464386	1195354	1671093	7088764	
Indirects @ 75% of Labor IDC						896515		896515	
Profit @ 10% of IDC								708876	
Total					1464386	2091869	1671093	8694156	
Banking Level: C.D.=.35								1317036	
Health & Safety Monitoring @ .06								600672	
Total Field Cost (TFC)								10611864	
Contingency @ 20% of TFC								2122373	
Engineering @ 5% of TFC								530593	
CAPITAL COST THIS PAGE								13264830	

AR000772

ORIGINAL

UTILITY
Stormwater Management System Dewatering
Alternative 5, 6, 7, 8 & 9
(MILWAUKEE)

(red)

ITEM	QUANTITY	DIRECT UNIT PRICE			DIRECT UNIT COST			ITEM DIRECT COST	COMMENTS
		MATERIALS	LABOR	EQUIPMENT	MATERIALS	LABOR	EQUIPMENT		
Dewatering Wells	35								
Boring	700	IF	\$40.00 (total unit \$)				28000		
Well Screen	140	IF	\$8.00 (total unit \$)				1120		35 wells @ 20' ea. Two stormwater ponds will be constructed at a time. Therefore, some material will be used twice.
Install Well Screen	350	IF	\$5.00 (total unit \$)				1750		
Gravel Pack - 8.75 cft/well	305	IF	\$4.00 (total unit \$)				1220		
PVC Riser - 6 in.	140	IF	\$8.00 (total unit \$)				1120		
Install PVC Riser	350	IF	\$4.00 (total unit \$)				1400		
Pipe Manifold & Conductor	1000	IF	\$10.00 (total unit \$)				10000		
Electric Cable	2000	IF	\$6.00 (total unit \$)				12000		
Install & Pull Pumps	35	EA	\$700.00 (total unit \$)				24500		
Pull Wells	35	EA	\$5.00 (total unit \$)				175		
Plug Wells	175	CF	\$30.00 (total unit \$)				5250		
Sub/bump			\$5000.00 (total unit \$)				5000		
Total							91535		
Subcontractor @ 10% of Sub. Cost							9154		
Bond @ 1% of Labor Cost							0		
Labor @ 15% of Labor Cost							0		
Material @ 5% of Material Cost							0		
Total Direct Costs (IDC)							100689		
Indirects 7% of Labor IDC							0		
Profit @ 10% of IDC							10069		
Total							110757		
Working Level: 0 - 15							0		
Health & Safety Monitoring @ .10							11076		
Total Field Cost (IFC)							121833		
Contingency @ 20% of IFC							24367		
Engineering @ 30% of IFC							12183		
CAPITAL COST THIS PAGE							158303		

AR000773

ORIGINAL

(red)

WILCOBE
 Stormwater Management System
 Alternative 5, 6, 7, 8, 9 & 10
 (MILSRS2)

ITEM	QUANTITY	DIRECT UNIT PRICE			DIRECT UNIT COST			ITEM DIRECT COST	COMMENTS
		MATERIALS	LABOR	EQUIPMENT	MATERIALS	LABOR	EQUIPMENT		
Excavation	22900		\$1.67	\$2.58	0	38243	59082	97325	
Clay - 2 ft.	7900		\$3.76	\$7.47		29704	59013	159817	
30 Mil Polybrane	106000		\$0.30		31800	21200	0	53600	
Sand/gravel - 1 ft.	3900		\$1.20	\$2.83	39000	4680	11037	54717	
Stone - 1 ft.	3900		\$1.20	\$2.83	39000	4680	11037	54717	
Endbankments	3120		\$3.76	\$7.47	28000	11731	23306	63118	3-8 in. diameter
Concrete Pipe - 15 in.	120		\$3.12	\$0.48	744	374	58	1176	
Sheet Piling	200		\$6.40	\$1.49	1792	361	417	2570	
Refr	4		\$500.00		4000	2000	0	6000	
Stone Pippap	200		\$7.50	\$4.87	2100	1364	1380	4844	
Silt fences	2300		\$2.40	\$0.96	5060	5520	2208	12788	
Total					0	222676	119857	167539	510072
Subcontractor @ 10% of Sub. Cost					0			0	
Burden @ 13% of Labor Cost								15581	
Labor @ 1% of Labor Cost								17979	
Material @ 5% of Material Cost						11134		11134	
Total Project Costs (TTC)					0	233810	153417	167539	554766
Indirects 75% of Labor TTC								115063	
Profit @ 10% of TTC								55477	
Total					0	233810	268481	167539	725306
Working Level: 0.15								65403	
Health & Safety Provisioning @ .08								63257	
Total Field Cost (TFC)								853965	
Contingency @ 20% of TFC								170793	
Engineering @ 5% of TFC								42698	
CAPITAL COST THIS PAGE								1067456	

AR000774

ORIGINAL

(red)

MATERIAL
Groundwater Wells
Installation
(PHILADELPHIA)

ITEM	QUANTITY	DIRECT UNIT PRICE			DIRECT UNIT COST			ITEM DIRECT COST	COMMENTS
		MATERIALS	LABOR	EQUIPMENT	MATERIALS	LABOR	EQUIPMENT		
Pumps	23	1A	\$150.00 (Total Unit \$)			34500			
Extraction Wells	240	1E	\$60.00 (Total Unit \$)			14400			
Injection Wells	200	1F	\$40.00 (Total Unit \$)			8000			
Piping	4500	1I	\$8.50 (Total Unit \$)			38250			
Total						95150			
Subcontractor @ 10% of Sub. Cost						9515			
Load @ 1.37% of Labor Cost						0			
Load @ 1% of Labor Cost						0			
Material @ 5% of Material Cost						0			
Total Direct Costs (DCC)						104665			
Indirects - 7.5% of Labor DCC						0			
Profit @ 10% of DCC						10467			
Total						115132			
Working Level: C.D. .35						0			
Health & Safety Bonification @ .08						11513			
Total Field Cost (TFC)						126645			
Contingency @ 20% of TFC						25329			
Engineering @ 5% of TFC						6332			
CAPITAL COST THIS PAGE						158306			

AR000775

ORIGINAL

MILITARY
Groundwater Treatment
System
(MILIGIS)

ITEM	QUANTITY	DIRECT UNIT PRICE			DIRECT UNIT COST			ITEM DIRECT COST	COMMENTS
		MATERIALS	LABOR	EQUIPMENT	MATERIALS	LABOR	EQUIPMENT		
a. Equipment									
b. Neutralization Tank	1	EA \$6500.00	\$600.00		6500	600	7100		
c. Clarifier	1	EA \$6000.00	\$600.00		6000	600	6600		
d. Lime Feed System	1	EA \$143100.00	\$37100.00		143100	37100	180200	I. b. 7.5 HP	
e. Clarifier Underflow Pumps	2	EA \$75000.00 (Total Unit \$)			75000		150000		
f. Distribution Tank	1	EA \$9000.00	\$800.00		9000	800	9800		
g. Rejection Pumps	2	EA \$3000.00	\$300.00		6000	600	6600		
h. Polymer Feed System	1	EA \$4500.00	\$400.00		4500	400	4900		
i. Carbon Filter	2	EA \$110000.00	\$5000.00		220000	10000	230000		
j. Air Stripper	1	EA \$100000.00	\$40000.00		100000	40000	140000		
k. Treat. Supply Pumps	2	EA \$5000.00	\$300.00		10000	600	10600		
l. Piping	1400	LF \$45.15	\$19.20		63210	26880	90090		
m. Treatment Building	1	SF \$30.00 (Total Unit \$)	\$26.00		36000		36000	Treatment Building	
n. Foundations	223	CY \$200.00	\$385.00		44600	85955	130555	Building & Foundations.	
o. Electrical									
a. Motor Starter #1	14	EA \$800.00	\$200.00		11200	2800	14000		
b. Motor Starter #2	2	EA \$1300.00	\$300.00		2600	600	3200		
c. Disconnect Switch	4	EA \$800.00	\$200.00		3200	800	4000		
d. Transformer	1	EA \$1200.00	\$500.00		1200	500	1700		
e. Conduit, Cable, Control	16	EA \$455.00	\$680.00		7280	10880	18160		
f. Grounding/Mixing	2	LOT \$6000.00	\$6000.00		12000	12000	24000		
Total					111000	231615	1061803		
Subcontractor @ 10% of Sub. Cost					11100		11100		
Insulation @ 13% of Labor Cost						30110	30110		
Labor @ 15% of Labor Cost						34742	34742		
Material @ 5% of Material Cost					36670		36670		
Total Direct Costs (IDC)					122100	770060	1194425		
Indirects 75% of Labor IDC						222350	222350		
Profit @ 10% of IDC							119442		
Total					122100	770060	1546712		
Working level: 0-.15							77023		
Health & Safety Monitoring @ .016							129123		
Total Field Cost (IFC)							1743163		
Contingency @ 20% of IFC							348633		
Engineering @ 5% of IFC							87158		
CAPITAL COST THIS PAGE							2178954		

(red)

AR000776

ORIGINAL

(red)

000000
 San Jose Debris
 Offsite Disposal
 (RILLIBRIS)

ITEM	QUANTITY	DIRECT UNIT PRICE			DIRECT UNIT COST			ITEM DIRECT COST	COMMENTS
		MATERIALS	LABOR	EQUIPMENT	MATERIALS	LABOR	EQUIPMENT		
Transportation	2500	1A	\$4.00 / LM (Total Unit \$)		10000		10000	CLCOS-125 miles one way	
Disposal	20	1	\$110.00 / Ton (Total Unit \$)		2200		2200	Offsite disposal of	
Disposal - drums	750	1A	\$40.00 / drum (Total Unit \$)		10000		10000	debris, fe. railroad	
Total					22200		22200	ties, wooden pallets,	
Subcontractor @ 10% of Sub. Cost					2220		2220	battery casing, cupolas,	
Ridden @ 1% of Labor Cost					0		0	2220 piping etc.	
Labor @ 1% of Labor Cost					0		0		
Material @ 5% of Material Cost					0		0		
Total Direct Costs (DDC)					24420		24420		
Indirects - 2% of Labor DDC					0		0		
Profit @ 10% of DDC					2442		2442		
Total					24420		24420		
Working Level: C @ .35					0		0		
Health & Safety Monitoring @ .10					2606		2606		
Total Field Cost (DFC)					29548		29548		
Contingency @ 20% of DDC					5910		5910		
Engineering @ 5% of DDC					1477		1477		
CAPERS COST DDC - PRCG					36935		36935		

AR000777

ORIGINAL
(red)

00110111
Surface Water Treatment
System
(001150)

ITEM	QUANTITY	DIRECT UNIT PRICE				DIRECT UNIT COST				ITEM COST	COMMENTS
		MATERIALS	LABOR	EQUIPMENT	SUB.	MATERIALS	LABOR	EQUIPMENT			
1. Equipment											
a. Neutralization Tank	1	EA \$500.00	\$100.00			500	100		600		
b. Neutralization Mixer	1	EA \$800.00	\$200.00			800	200		1000		
c. Treat. Supply Pumps	2	EA \$1400.00	\$200.00			2800	400		3200		
d. Equalization tank	1	EA \$300.00	\$100.00			300	100		400		
e. Polymer Mix Tank	1	EA \$300.00	\$100.00			300	100		400		
f. Piping	1000	LF \$12.00	\$5.90			12000	5900		17900		
2. Treatment Building	1	SF \$5.00	(Total Unit \$)		750	2200	4180		750	750	Treatment Building
3. Foundations	11	CY \$200.00	\$300.00	\$20.00			4180		6380		Building & foundations.
4. Sedimentation Basin	1	EA \$7000.00	\$200.00				7000	200	7200		
5. Electrical											
a. Motor Starter #1	4	EA \$100.00	\$70.00			3700	800		4000		
b. Disconnect Switch	1	EA \$800.00	\$200.00			800	200		1000		
c. Control Cable, Control	4	EA \$450.00	\$650.00			1800	2600		4400		
d. Grounding/Wiring	2	LOI \$500.00	\$500.00			1000	1000		2000		
Total						750	25700	22580	200	49230	
Subcontractor @ 10% of Sub. Cost						75				75	
Burden @ 1% of Labor Cost							2935			2935	
Labor @ 15% of Labor Cost							3387			3387	
Material @ 5% of Material Cost						1285				1285	
Total Direct Costs (DRC)						825	26985	28902	21677	56912	
Indirects 7.5% of Labor @								21677		21677	
Profit @ 10% of DRC										5691	
Total						825	26985	50579		64290	
Boiling Level: B 15										7587	
Health & Safety Monitoring										9187	
at 10											
Total Fixed Cost (FC)										101054	
Contingency @ 20% of FC										20211	
Engineering @ 5% of FC										5053	
CONTRACT COST 100% 1764										17648	

AR000778

ORIGINAL

(red)

BILL OF MATERIALS
Installation
(REVERSE)

ITEM	QUANTITY	DIRECT UNIT PRICE				DIRECT COST	CONTRIBUTES
		MATERIALS	LABOR	EQUIPMENT	SUB.		
Positioning Wells	100	11	\$80.00	(Total Unit \$)	14400	1. 4 New Wells	
Total					14400		
Subcontractor @ 10% of Sub. Cost					1440		
Burden @ 1.3% of Labor Cost			0		0		
Labour @ 15% of Labor Cost			0		0		
Factorial @ 5% of Material Cost			0		0		
Total Direct Costs (100)			0	0	15840		
Indirects 7% of Labor 100			0		0		
Profit @ 10% of 100					1504		
Total			0	0	17424		
Positioning Level: C, D, E					0		
Health & Safety Positioning					1742		
Total Field Cost (100)					19166		
Contingency @ 20% of 100					3833		
Engineering @ 5% of 100					958		
CAPITAL COST THIS PAGE					23958		

AR000779

K A # 1

SUMMARY OF SENSITIVITY ANALYSIS

(COST IN THOUSAND)

COST FACTOR	BASELINE COST	SENSITIVITY FACTOR EXAMINED RESULTS		
		LOW	HIGH	ORIGINAL
CAPITAL COSTS (\$):	22667	20437	26694	ORIGINAL (red)
PRESENT WORTH (\$):	25165	22935	29192	
ANNUAL COSTS (Year:)	1	611	611	611
	2	611	611	611
	3	187	187	187
	4			
	5			
	6			
	7			
	8			
	9			
	10			
	11			
	12			
	13			
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AR000781

DRAFT

ORIGINAL
(red)

REMEDIAL ACTION ALTERNATIVE 8

AR000782

MILLCREEK
 Excavation of Contaminated Sediments
 Onsite Disposal
 (MILLEX2)
 4-17-88

ITEM	QUANTITY	DIRECT UNIT PRICE			DIRECT UNIT COST			ITEM DIRECT COST	COMMENTS
		MATERIALS	LABOR	EQUIPMENT	MATERIALS	LABOR	EQUIPMENT		
Excavation	8100	CY	\$1.67	\$2.58	0	13527	20898	34425	Erosion control bench
Dredge Swamp	6200	CY	\$4.19	\$5.05	0	25978	31310	57288	
Backfill Swamp	6200	CY	\$1.50	\$2.83	9300	7440	17546	34286	
Silt Fences	4100	LF	\$2.25	\$0.16	9225	656	0	9881	
Total					0	18525	69754	135880	
Subcontractor @ 10% of Sub. Cost					0			0	
Burden @ 13% of Labor Cost						6188		6188	
Labor @ 15% of Labor Cost						7140		7140	
Material @ 5% of Material Cost					926			926	
Total Direct Costs (TDC)					0	19451	69754	150135	
Indirects 75% of Labor TDC						45697		45697	
Profit @ 10% of TDC						15013		15013	
Total					0	19451	69754	210845	
Working Level: C=.7						106626		123466	
Health & Safety Monitoring @ .10								33431	
Total Field Cost (TFC)								367742	
Contingency @ 20% of TFC								73548	
Engineering @ 5% of TFC								18387	
CAPITAL COST THIS PAGE								459678	

ORIGINAL
 (red)

AR000783

ORIGINAL
(red)

MILLCREEK
Soil/Membrane/Clay
A L T S

ITEM	QUANTITY	DIRECT UNIT PRICE			DIRECT UNIT COST			ITEM DIRECT COST	COMMENTS
		MATERIALS	LABOR	EQUIPMENT	MATERIALS	LABOR	EQUIPMENT		
Clear & Grub	43	AC	\$10.00	\$1280.00	0	43430	55040	98470	
Grade	46300	CY	\$1.40	\$1.24	0	64820	57412	122232	
Topsoil- 6 in.	36057	CY	\$5.50	\$1.20	\$2.83	198316	43269	343627	
Soil- 18 in.	108172	CY	\$1.50	\$1.20	\$2.83	162258	129807	598192	2. Common Borrow
Filter Fabric	1947100	SY	\$1.00	\$0.20		1947100	389420	2336520	
Gravel- 12 in.	72115	CY	\$10.00	\$1.20	\$2.83	721148	86538	1011771	
50 Mil Membrane	1947100	SF	\$0.50	\$0.20		1298067	542303	1362970	
Clay- 24 in.	144230	CY	\$9.00	\$3.76	\$7.47	46002	10472	2917765	
Chain Link Fence	8400	LF	\$9.65	(Total Unit \$)				81060	
Revegetation	1870	MSF	\$24.60	\$5.60	\$4.45			64796	
Total						4372891	1310059	1810424	8937403
Subcontractor @ 10% of Sub. Cost						144403			144403
Burden @ 13% of Labor Cost							170308		170308
Labor @ 15% of Labor Cost							196509		196509
Material @ 5% of Material Cost						218645			218645
Total Direct Costs (TDC)						1588433	4591535	1810424	9667267
Indirects 75% of Labor TDC							1257656		1257656
Profit @ 10% of TDC									966727
Total						1588433	4591535	1810424	11891650
Working Level: C.D=.35									1660734
Health & Safety Monitoring @ .06									813143
Total Field Cost (TFC)									14365528
Contingency @ 20% of TFC									2873106
Engineering @ 5% of TFC									718276
CAPITAL COST THIS PAGE									17956910

AR000784

BILLCHIEK
Monitoring Well
Installation
(MUTWELL)

ITEM	QUANTITY	DIRECT UNIT PRICE				SUB.	DIRECT UNIT COST				ITEM DIRECT COST	COMMENTS
		LF	MATERIALS	LABOR	EQUIPMENT		MATERIALS	LABOR	EQUIPMENT			
Monitoring Wells	180	LF	\$80.00	(Total Unit \$)		14400					14400	1. 4 New Wells
Total						14400					14400	
Subcontractor @ 10% of Sub. Cost						1440					1440	
Burden @ 13% of Labor Cost							0				0	
Labor @ 15% of Labor Cost							0				0	
Material @ 5% of Material Cost							0				0	
Total Direct Costs (IDC)						15840	0	0	0	0	15840	
Indirects 7% of Labor IDC							0				0	
Profit @ 10% of IDC											1584	
Total						15840	0	0	0	0	17424	
Roofing level: C.D. .35											0	
Health & Safety Monitoring @ .08											1742	
Total Field Cost (TFC)											19166	
Contingency @ 20% of TFC											3833	
Engineering @ 5% of TFC											958	
CAPITAL COST THIS PAGE											23958	

ORIGINAL

(red)

AR000785

ORIGINAL
(red)

BLITCHER
Surface Water Treatment
System
(HILLSM)

ITEM	QUANTITY	DIRECT UNIT PRICE			DIRECT UNIT COST			ITEM DIRECT COST	COMMENTS
		MATERIALS	LABOR	EQUIPMENT	MATERIALS	LABOR	EQUIPMENT		
1. Equipment									
a. Neutralization Tank	1	EA \$500.00	\$100.00		500	100	600		
b. Neutralization Mixer	1	EA \$800.00	\$200.00		800	200	1000		
c. Treat. Supply Pumps	2	EA \$1400.00	\$200.00		2800	400	3200		1. b. 1.5 HP
d. Equalization Tank	1	EA \$300.00	\$100.00		300	100	400		
e. Polymer Mix Tank	1	EA \$300.00	\$100.00		300	100	400		
f. Piping	1000	LF \$12.00	\$5.90		12000	5900	17900		
g. Treatment Building	150	SF \$5.00	(Total Unit \$)				750		750 Treatment Building
h. Foundations	11	CY \$200.00	\$380.00	\$20.00	2200	4180	6380		6380 Building & Foundations.
i. Sedimentation Basin	1	EA	\$7000.00	\$200.00		7000	7200		
j. Electrical									
a. Motor Starter #1	4	EA \$800.00	\$200.00		3200	800	4000		
b. Disconnect Switch	1	EA \$800.00	\$200.00		800	200	1000		
c. Conduit, Cable, Control	4	EA \$450.00	\$650.00		1800	2600	4400		
d. Grounding/Mirring	2	LOT \$500.00	\$500.00		1000	1000	2000		
Total					750	25700	22580	49230	
Subcontractor @ 10% of Sub. Cost					75		75		
Burden @ 13% of Labor Cost						2935	2935		
Labor @ 15% of Labor Cost						3387	3387		
Material @ 5% of Material Cost					1285		1285		
Total Direct Costs (HIC)					825	26985	28902	56912	
Indirects 75% of Labor 10						21677	21677	21677	
Profit @ 10% of HIC								5691	
Total					825	26985	50579	64280	
Working Level: D .15								7507	
Health & Safety Monitoring								9187	
at .10									
Total Field Cost (HIC)								101054	
Contingency @ 20% of HIC								20211	
Engineering @ 5% of HIC								5053	
TOTAL COST HILL F&E								126318	

ARC000786

BILCHER
 Surface Debris
 Offsite Disposal
 (FILLDEBRIS)

ITEM	QUANTITY	DIRECT UNIT PRICE			SUB.	DIRECT UNIT COST			ITEM DIRECT COST	COMMENTS
		MATERIALS	LABOR	EQUIPMENT		MATERIALS	LABOR	EQUIPMENT		
Transportation	2500	LH	\$4.00 / LH (Total Unit \$)		10000			10000	CLCOS-125 miles one way	
Disposal	20	T	\$110.00 / ton (Total Unit \$)		2200			2200	Offsite disposal of	
Disposal- drums	750	EA	\$40.00 / drum (Total Unit \$)		10000			10000	debris, ie. railroad	
Total					22200			22200	ties, wooden pallets,	
Subcontractor @ 10% of Sub. Cost					2220			2220	battery casing, cupotas,	
Burden @ 1.3% of Labor Cost								0	2220 piping etc.	
Labor @ 15% of Labor Cost								0		
Material @ 5% of Material Cost								0		
Total Direct Costs (DCC)					24420			24420		
Indirects 7.5% of Labor DCC								0		
Profit @ 10% of DCC								2442		
Total					24420			26862		
Working Level: Cap .35								0		
Health & Safety Monitoring @ .10								2606		
Total Field Cost (TFC)								29548		
Contingency @ 20% of TFC								5910		
Engineering @ 5% of TFC								1477		
CAPITAL COST THIS PAGE								36935		

ORIGINAL
 (red)

AR000787

MILLCREEK
Groundwater Treatment
System
(MILLIGS)

ITEM	QUANTITY	DIRECT UNIT PRICE			DIRECT UNIT COST			ITEM DIRECT COST	COMMENTS
		MATERIALS	LABOR	EQUIPMENT	SUB.	MATERIALS	LABOR		
1. Equipment									
a. Neutralization Tank	1	EA \$6500.00	\$600.00			6500	600	7100	
b. Neutralization Mixer	1	EA \$6000.00	\$600.00			6000	600	6600	
c. Clarifier	1	EA \$143100.00	\$37100.00			143100	37100	180200	
d. Lime Feed System	1	EA \$75000.00	(Total Unit \$)		75000	75000		150000	
e. Clarifier Underflow Pumps	2	EA \$4000.00	\$300.00			8000	600	8600	
f. Distribution Tank	1	EA \$9000.00	\$800.00			9000	800	9800	
g. ReInjection Pumps	2	EA \$3000.00	\$300.00			6000	600	6600	
h. Polymer Feed System	1	EA \$4500.00	\$400.00			4500	400	4900	
i. Carbon Filter	2	EA \$110000.00	\$5000.00			220000	10000	230000	
j. Air Stripper	1	EA \$100000.00	\$40000.00			100000	40000	140000	
k. Treat. Supply Pumps	2	EA \$5000.00	\$300.00			10000	600	10600	
l. Piping	1400	LF \$45.15	\$19.20			63210	26880	90090	
m. Treatment Building	1200	SF \$30.00	(Total Unit \$)		36000			36000	
n. Foundations	223	CY \$200.00	\$385.00	\$26.00		44600	85855	136253	
o. Electrical									
a. Motor Starter #1	14	EA \$800.00	\$200.00			11200	2800	14000	
b. Motor Starter #2	2	EA \$1300.00	\$300.00			2600	600	3200	
c. Disconnect Switch	4	EA \$800.00	\$200.00			3200	800	4000	
d. Transformer	1	EA \$1200.00	\$500.00			1200	500	1700	
e. Conduit,Cable,Control	16	EA \$455.00	\$680.00			7280	10880	18160	
f. Grounding/Wiring	2	LOT \$6000.00	\$6000.00			12000	12000	24000	
Total					111000	733390	231615	1061803	
Subcontractor @ 10% of Sub. Cost					11100			11100	
Burden @ 13% of Labor Cost							30110	30110	
Labor @ 15% of Labor Cost							34742	34742	
Material @ 5% of Material Cost						36670		36670	
Total Direct Costs (TDC)					122100	770060	296467	1194425	
Indirects 75% of Labor TDC							222350	222350	
Profit @ 10% of TDC								119442	
Total					122100	770060	518816	1536216	
Working level: 0=.15								77823	
Health & Safety Monitoring @ .06								129123	
Total Field Cost (TFC)								1743162	
Contingency @ 20% of TFC								348633	
Engineering @ 5% of TFC								87158	
CAPITAL COST THIS PAGE								2176954	

ORIGINAL
(red)

788

ORIGINAL
(red)

MURCIER
Groundwater Wells
Installation
(PHILADELPHIA)

ITEM	QUANTITY	DIRECT UNIT PRICE			DIRECT UNIT COST			TOTAL DIRECT COST	COMMENTS
		MATERIALS	LABOR	EQUIPMENT	MATERIALS	LABOR	EQUIPMENT		
Pumps	23	EA	\$1500.00 (Total Unit \$)			34500			
Extraction Wells	240	LF	\$60.00 (Total Unit \$)			14400			
Injection Wells	200	LF	\$40.00 (Total Unit \$)			8000			
Piping	4500	LF	\$8.50 (Total Unit \$)			38250			
Total						95150			
Subcontractor @ 10% of Sub. Cost						9515			
Burden @ 1% of Labor Cost					0	0			
Labor @ 15% of Labor Cost					0	0			
Material @ 5% of Material Cost					0	0			
Total Project Costs (TIC)					0	0	104665		
Indirects 75% of Labor TIC					0	0	0		
Profit @ 10% of TIC							10467		
Total					0	0	115132		
Working Level: C ₀ = .35							11513		
Health & Safety Monitoring @ .08									
Total Field Cost (TFC)							126645		
Contingency @ 20% of TIC							25329		
Engineering @ 5% of TIC							6332		
CAPITAL COST THIS PAGE							158306		

AR000789

MILLCREEK
 Stormwater Management System
 Alternative 5.6, 7, 8, 9 & 10
 (MILSMS?)

ITEM	QUANTITY	DIRECT UNIT PRICE			SUB.	DIRECT UNIT COST			ITEM DIRECT COST	COMMENTS
		MATERIALS	LABOR	EQUIPMENT		MATERIALS	LABOR	EQUIPMENT		
Excavation	22900		\$1.67	\$2.58		0	38243	59082	97325	
Clay- 2 ft.	7900	CY	\$3.76	\$7.47			29704	59013	159817	
30 Mil Membrane	106000	SF	\$0.30			31800	21200	0	53000	
Sand/Gravel- 1 ft.	3900	CY	\$10.00	\$2.83		39000	4680	11037	54717	
Stone- 1 ft.	3900	CY	\$10.00	\$2.83		39000	4680	11037	54717	3-8 in. diameter
Embankments	3120	CY	\$9.00	\$7.47		28000	11731	23306	63118	
Concrete Pipe- 15 in.	120	LF	\$6.20	\$0.48		744	374	58	1176	
Sheet Piling	280	SF	\$6.40	\$1.29		1792	361	417	2570	
Weir	4	EA	\$1000.00	\$500.00		4000	2000	0	6000	
Stone Riprap	280	CY	\$7.50	\$4.87		2100	1364	1380	4844	
Silt fences	2300	LF	\$2.20	\$0.96		5060	5520	2208	12788	
Total						0	222676	167539	510072	
Subcontractor @ 10% of Sub. Cost						0			0	
Burden @ 13% of Labor Cost							15581		15581	
Labor @ 15% of Labor Cost							17979		17979	
Material @ 5% of Material Cost						11134			11134	
Total Direct Costs (TDC)						0	233810	167539	554766	
Indirects 75% of Labor TDC							115063		115063	
Profit @ 10% of TDC							55477		55477	
Total						0	233810	167539	725306	
Working level: 0=.15									65403	
Health & Safety Monitoring @ .08									63257	
Total Field Cost (IFC)									853965	
Contingency @ 20% of IFC									170793	
Engineering @ 5% of IFC									42698	
CAPITAL COST THIS PAGE									1067456	

ORIGINAL
 (red)

AR000790

MIH/IRLK
Stormwater Management System Dewatering
Alternative 5, 6, 7, 8 & 9
(MIH/IRLW)

ITEM	QUANTITY	DIRECT UNIT PRICE			DIRECT UNIT COST			ITEM DIRECT COST	COMMENTS
		MATERIALS	LABOR	EQUIPMENT	MATERIALS	LABOR	EQUIPMENT		
Dewatering Wells	35								35 wells @ 20' ea.
Boring	700	LF	\$40.00 (total unit \$)		28000		28000		Two stormwater ponds
Well Screen	140	LF	\$8.00 (total unit \$)		1120		1120		will be constructed
Install Well Screen	350	LF	\$5.00 (total unit \$)		1750		1750		at a time. Therefore,
Gravel Pack - 8.72 cf/well	305	CF	\$4.00 (total unit \$)		1220		1220		some material will be
PVC Riser - 6 in.	140	LF	\$8.00 (total unit \$)		1120		1120		used twice.
Install PVC Riser	350	LF	\$4.00 (total unit \$)		1400		1400		
Pipe Manifold & Conductor	1000	LF	\$10.00 (total unit \$)		10000		10000		
Electric Cable	2000	LF	\$6.00 (total unit \$)		12000		12000		
Install & Pull Pumps	35	EA	\$700.00 (total unit \$)		24500		24500		
Plug Wells	35	EA	\$5.00 (total unit \$)		175		175		
Plug Wells	175	CF	\$30.00 (total unit \$)		5250		5250		
Mob/Demob			\$5000.00 (total unit \$)		5000		5000		
Total					91535	0	0	91535	
Subcontractor @ 10% of Sub. Cost					9154			9154	
Burden @ 13% of Labor Cost					0		0	0	
Labor @ 15% of Labor Cost					0		0	0	
Material @ 5% of Material Cost					0		0	0	
Total Direct Costs (TDC)					100689	0	0	100689	
Indirects 75% of labor TDC							0	0	
Profit @ 10% of TDC								10069	
Total					100689	0	0	110757	
Monitoring level: 0=.15								0	
Health & Safety Monitoring @ .10								11076	
Total Field Cost (TFC)								121833	
Contingency @ 20% of TFC								24367	
Engineering @ 30% of TFC								12183	
CAPITAL COST THIS PAGE								158383	

ORIGINAL
 (red)

AR000791

PRESENT WORTH ANALYSIS

SITE: MILLCREEK
 ALTERNATIVE NO.: 3a
 24696

COST COMPONENT	0	1	2	3	4	5	6	7	8	9	10	11
1. CAPITAL COSTS	22198											
2. O & M COSTS	---	611	611	187	187	187	187	187	187	187	187	187
3. ANNUAL COSTS	22198	611	0.826	0.751	0.683	0.621	0.564	0.513	0.467	0.424	0.386	0.35
4. ANNUAL DISCOUNT RATE=10%	1	0.909										
PRESENT WORTH =	22198	555	505	140	128	116	105	96	87	79	72	65
	12	13	14	15	16	17	18	19	20	21	22	23
O & M COSTS	187	187	187	187	187	187	187	187	187	187	187	187
ANNUAL DISCOUNT RATE=10%	0.319	0.29	0.263	0.239	0.218	0.198	0.18	0.164	0.149	0.135	0.123	0.112
PRESENT WORTH =	60	54	49	45	41	37	34	31	28	25	23	21

COST COMPONENT	0	1	2	3	4	5	6	7	8	9	10	11
1. CAPITAL COSTS	22198											
2. O & M COSTS	---	187	187	187	187	187	187	187	187	187	187	187
3. ANNUAL COSTS	22198	187	0.092	0.084	0.076	0.069	0.063	0.057	0.051	0.046	0.041	0.037
4. ANNUAL DISCOUNT RATE=10%	1	0.909										
PRESENT WORTH =	24696	171	16	14	13	12	11	10	9	8	7	6
	24	25	26	27	28	29	30	31	32	33	34	35
O & M COSTS	187	187	187	187	187	187	187	187	187	187	187	187
ANNUAL DISCOUNT RATE=10%	0.101	0.092	0.084	0.076	0.069	0.063	0.057	0.051	0.046	0.041	0.037	0.033
PRESENT WORTH =	19	17	16	14	13	12	11	10	9	8	7	6

ORIGINAL
 (red)

AR000792

SITE: MILLCREEK
 ALTERNATIVE NO.: 8b
 21624

PRESENT WORTH ANALYSIS

COST COMPONENT	COST/YEAR COST OCCURS (\$000's)											
	0	1	2	3	4	5	6	7	8	9	10	11
1. CAPITAL COSTS	19861											
2. O & M COSTS	---	187	187	187	187	187	187	187	187	187	187	187
3. ANNUAL COSTS	19861	187	187	187	187	187	187	187	187	187	187	187
4. ANNUAL DISCOUNT RATE=10%	1	0.909	0.826	0.751	0.683	0.621	0.564	0.513	0.467	0.424	0.386	0.35
PRESENT WORTH =	19861	170	154	140	128	116	105	96	87	79	72	65

O & M COSTS	12	13	14	15	16	17	18	19	20	21	22	23
ANNUAL DISCOUNT RATE=10%	187	187	187	187	187	187	187	187	187	187	187	187
PRESENT WORTH =	0.319	0.29	0.263	0.239	0.218	0.198	0.18	0.164	0.149	0.135	0.123	0.112

O & M COSTS	24	25	26	27	28	29	30	TOTAL				
ANNUAL DISCOUNT RATE=10%	187	187	187	187	187	187	187	PRESENT				
PRESENT WORTH =	0.101	0.092	0.084	0.076	0.069	0.063	0.057	WORTH				

PRESENT WORTH = 19 17 16 14 13 12 11												
=====												
21624												
=====												

ORIGINAL
 (red)

AR000793

R.H.H. & H.

SUMMARY OF SENSITIVITY ANALYSIS

(COST IN 000'S)

COST FACTOR	BASELINE COST	SENSITIVITY FACTOR EXAMINED RESULTS				
		LOW	HIGH			
CAPITAL COSTS (\$):	22,198	17743	27015		ORIGINAL	
PRESENT WORTH (\$):	24696	20241	29513			(red)
ANNUAL COSTS / Year/S:	1	611	611	611		
	2	611	611	611		
	3	187	187	187		
	4					
	5					
	6					
	7					
	8					
	9					
	10					
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	28					
	29					
	30					

AR000794

KHH 8 B

SUMMARY OF SENSITIVITY ANALYSIS

(COST IN 000'S)

COST FACTOR	BASELINE COST	SENSITIVITY FACTOR EXAMINED RESULTS		
		Low	2.154	
CAPITAL COSTS (\$):	19861	15873	23976	
PRESENT WORTH (\$):	21624	17636	25739	
ANNUAL COSTS (Year's)	1	187	187	187
	2			
	3			
	4			
	5			
	6			
	7			
	8			
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ORIGINAL

(red)

AR000795

DRAFT

ORIGINAL

(red)

REMEDIAL ACTION ALTERNATIVE 9

AR000796

MILLCREEK
Excavation-Alternatives A
Onsite Disposal

ITEM	QUANTITY	DIRECT UNIT PRICE			SUB.	DIRECT UNIT COST			ITEM DIRECT COST	COMMENTS
		MATERIALS	LABOR	EQUIPMENT		MATERIALS	LABOR	EQUIPMENT		
Excavation - Dragline	12700	CY	\$1.67	\$2.58		0	21209	32766	53975	Southeast corner
Excavation	8100	CY	\$1.67	\$2.58		0	13527	20898	34425	Erosion control bench
Excavation	450	CY	\$2.30	\$3.26		0	1035	1467	2502	Sediments from drained pond.
Excavation	73900	CY	\$1.35	\$2.25		0	99765	166275	266040	
Bridge Swamp - Dragline	6200	CY	\$4.19	\$5.05		0	25978	31310	57288	
Backfill Swamp	6200	CY	\$1.20	\$2.83		9300	7440	17546	34286	
Silt Fences	4100	LF	\$2.25	\$0.16		9225	656	0	9881	
Rehandle Dewatered Excav.	19000	CY	\$0.96	\$2.26		0	18240	42940	61180	
Total					0	18525	187850	313202	519577	
Subcontractor @ 10% of Sub. Cost					0				0	
Burden @ 13% of Labor Cost							24421		24421	
Labor @ 15% of Labor Cost							28178		28178	
Material @ 5% of Material Cost						926			926	
Total Direct Costs (TDC)					0	19451	240448	313202	573101	
Indirects 75% of Labor IDC							180336		180336	
Profit @ 10% of IDC									57310	
Total					0	19451	420784	313202	810747	
Working level: C=.7									513790	
Health & Safety Monitoring @ .10									132454	
Total Field Cost (TFC)									1456991	
Contingency @ 20% of TFC									291398	
Engineering @ 5% of TFC									72850	
CAPITAL COSTS THIS PAGE									1821239	

ORIGINAL
(red)

AR000797

MILLCREEK
 Onsite Landfill Cover
 Alternative 9
 (MILLERCB)

ITEM	QUANTITY	DIRECT UNIT PRICE			DIRECT UNIT COST			ITEM COST	COMMENTS
		MATERIALS	LABOR	EQUIPMENT	MATERIALS	LABOR	EQUIPMENT		
Topsoil- 6 in.	5600	CY	\$5.50	\$1.20	\$2.83	30800	6720	15848	53368
Soil- 18 in.	10000	CY	\$1.50	\$1.20	\$2.83	15000	12000	28300	55300
Filter Fabric	39000	SY	\$1.15	\$0.16		45770	6368		52138
Gravel- 12 in.	6600	CY	\$10.00	\$1.20	\$2.83	66000	7920	18678	92598
50 Mil Membrane	179000	SF	\$0.50	\$0.30		143200	50008	99351	143200
Clay- 24 in.	13300	CY	\$9.00	\$3.76	\$7.47	119700	4224		269059
Perf. PVC Pipe-4 in.	3200	LF	\$0.65	\$1.32		2080			6304
<hr/>									
Total			143200	279350	87240	162177			671967
Subcontractor @ 10% of Sub. Cost			14320						14320
Burden @ 13% of Labor Cost					11341				11341
Labor @ 15% of Labor Cost					13086				13086
Material @ 5% of Material Cost				13968					13968
<hr/>									
Total Direct Costs (IDC)			157520	293318	111667	162177			724682
Indirects 75% of Labor IDC					83750				83750
Profit @ 10% of IDC									72468
<hr/>									
Total			157520	293318	195418	162177			880900
Working Level: C,D,F,35									125158
Health & Safety Monitoring @ .08									80485
<hr/>									
Total Field Cost (TFC)									1086543
Contingency @ 20% of TFC									217309
Engineering @ 5% of TFC									54327
<hr/>									
CAPITAL COST THIS PAGE									1358179

ORIGINAL
 (red)

HILLCREEK
 RCRA Liner System/Partial
 Alternative 9
 (MILLERSB)

ITEM	QUANTITY	DIRECT UNIT PRICE			DIRECT UNIT COST			ITEM DIRECT COST	COMMENTS
		MATERIALS	LABOR	EQUIPMENT	MATERIALS	LABOR	EQUIPMENT		
Gravel- 24 in.	12300 CY	\$10.00	\$1.20	\$2.83	123000	14760	34809	172569	1. Quantities inclusive of leachate collection and detection zone.
Clay- 24 in.	12300 CY	\$9.00	\$3.76	\$7.47	110700	46248	91881	248829	
Filter Fabric	73500 SY	\$1.15	\$0.16		84525	11760		96285	
50 Mil Membrane	165400 SF	\$0.50	\$0.30					132320	
30 Mil Membrane	165400 SF	\$0.20	\$0.20					66160	
Perf. PVC Pipe- 4 in.	4800 LF	\$1.45	\$1.41		6960	6768		13728	
Embankments	85000 CY	\$9.00	\$3.76	\$7.47	765000	319600	634950	1719550	
Total					198480	399136	761640	2449441	
Subcontractor @ 10% of Sub. Cost					19848			19848	
Burden @ 13% of Labor Cost						51888		51888	
Labor @ 15% of Labor Cost						59870		59870	
Material @ 5% of Material Cost						54509		54509	
Total Direct Costs (IDC)					218328	510894	761640	2635556	
Indirects 75% of Labor IDC						383171		383171	
Profit @ 10% of IDC								263556	
Total					218328	1144694	761640	3282283	
Working Level: C, D- .35						894065		579497	
Health & Safety Monitoring @ .06								231707	
Total Field Cost (TFC)								4093486	
Contingency @ 20% of TFC								818697	
Engineering @ 5% of TFC								204674	
CAPITAL COST THIS PAGE								5116857	

ORIGINAL
 (red)

AR000799

MILLCREEK
Soil/Membrane/Clay
Alternative
(MILLRC8) 4

ITEM	QUANTITY	DIRECT UNIT PRICE			DIRECT UNIT COST			ITEM DIRECT COST	COMMENTS	
		MATERIALS	LABOR	EQUIPMENT	SUB.	MATERIALS	LABOR			EQUIPMENT
Clear & Grub	43	AC	\$1010.00	\$1280.00		0	43430	55040	98470	
Grade	46300	CY	\$0.66	\$3.11		0	30558	143993	174551	
Topsoil- 6 in.	28200	CY	\$5.50	\$1.20	\$2.83	155100	33840	79806	268746	
Soil- 18 in.	84700	CY	\$1.50	\$1.20	\$2.83	127050	101640	239701	468391	2. Common Borrow
Filter Fabric	338800	SY	\$1.15	\$0.16		389620	54208		443828	
Gravel- 12 in.	56500	CY	\$10.00	\$1.20	\$2.83	565000	67800	159095	792695	
50 Mil Membrane	1524600	SF	\$9.00	\$0.20	\$7.47	1016100	424504	843363	609840	
Clay- 24 in.	112900	CY	\$9.65	(Total Unit \$)		81060			2283967	
Chain Link Fence	8400	LF	\$24.60	\$5.60		46002	10472	8322	81060	
Revegetation	1870	MSF							64796	
Total						690900	2298872	766452	1530120	5286344
Subcontractor @ 10% of Sub. Cost						69090				69090
Burden @ 13% of Labor Cost								99639		99639
Labor @ 15% of Labor Cost								114968		114968
Material @ 5% of Material Cost							114944			114944
Total Direct Costs (TDC)						759990	2413816	981059	1530120	5684984
Indirects 75% of Labor TDC								735794		735794
Profit @ 10% of TDC										568498
Total						759990	2413816	1716852	1530120	6989276
Working Level: C.D.= .35										1136440
Health & Safety Monitoring @ .08										650057
Total Field Cost (TFC)										8775773
Contingency @ 20% of TFC										1755155
Engineering @ 5% of TFC										438789
CAPITAL COST THIS PAGE										10969717

ORIGINAL
(red)

AR000800

HILLBEEK
 Monitoring Well
 Installation
 (HILLBEEK)

ITEM	QUANTITY	DIRECT UNIT PRICE			DIRECT UNIT COST			ITEM DIRECT COST	COMMENTS
		LF	MATERIALS	LABOR	EQUIPMENT	MATERIALS	LABOR		
Monitoring Wells	180	\$80.00						14400	1. 4 New Wells
Total			14400					14400	
Subcontractor @ 10% of Sub. Cost			1440					1440	
Burden @ 1% of Labor Cost				0				0	
Labor @ 5% of Labor Cost				0				0	
Material @ 5% of Material Cost				0				0	
Total Direct Costs (TDC)			15840	0	0	0		15840	
Indirects 75% of Labor TDC				0				0	
Profit @ 10% of TDC								1584	
Total			15840	0	0	0		17424	
Working level: C.O. = .35								0	
Health & Safety Monitoring @ .08								1742	
Total Field Cost (TFC)								19166	
Contingency @ 20% of TFC								3833	
Engineering @ 5% of TFC								958	
CAPITAL COST THIS PAGE								23958	

ORIGINAL
 (red)

AR000801

MILICRIK
Surface Water Treatment
System
(MILC-11)

ITEM	QUANTITY	DIRECT UNIT PRICE			DIRECT UNIT COST			ITEM DIRECT COST	COMMENTS
		MATERIALS	LABOR	EQUIPMENT	MATERIALS	LABOR	EQUIPMENT		
1. Equipment									
a. Neutralization Tank	1	EA \$500.00	\$100.00		500	100		600	
b. Neutralization Mixer	1	EA \$800.00	\$200.00		800	200		1000	
c. Treat. Supply Pumps	2	EA \$1400.00	\$700.00		2800	400		3200	1. b. 1.5 HP
d. Equalization tank	1	EA \$300.00	\$100.00		300	100		400	
e. Polymer Mix Tank	1	EA \$300.00	\$100.00		300	100		400	
2. Piping	1000	LF \$12.00	\$5.90		12000	5900		17900	
3. Treatment Building	150	SF \$5.00	(Total Unit \$)		750	4150		4920	750 Treatment Building
4. Foundations	11	CY \$200.00	\$380.00	\$20.00	2200	4150	200	6380	Building & Foundations.
5. Sedimentation Basin	1	EA \$7000.00	\$7000.00	\$200.00	7000	200		7200	
6. Electrical									
a. Motor Starter #1	4	EA \$800.00	\$200.00		3200	800		4000	
c. Disconnect Switch	1	EA \$800.00	\$200.00		800	200		1000	
c. Conduit,Cable,Control	4	EA \$450.00	\$650.00		1800	2600		4400	
d. Grounding/Mirring	2	LOT \$500.00	\$500.00		1000	1000		2000	
Total					750	25700	200	49230	
Subcontractor @ 10% of Sub. Cost					75			75	
burden @ 13% of Labor Cost						2935		2935	
Labor @ 15% of Labor Cost						3387		3387	
Material @ 5% of Material Cost						1285		1285	
Total Direct Costs (DCC)					825	26985	28902	56912	
Indirects 7.5% of Labor ID						21677		21677	
Profit @ 10% of DCC								5691	
Total					825	26985	50579	84280	
Working Level: P. 15								7587	
Health & Safety Monitoring								9187	
at .10									
Total Field Cost (IFC)								101054	
Contingency @ 20% of IFC								20211	
Engineering @ 5% of IFC								5053	
CAPITAL COST THIS PAGE								126318	

ORIGINAL
(red)

MILLERIK
Surface Debris
Offsite Disposal
(FILLDEBRIS)

ITEM	QUANTITY	DIRECT UNIT PRICE			DIRECT UNIT COST			ITEM COST	COMMENTS
		MATERIALS	LABOR	EQUIPMENT	MATERIALS	LABOR	EQUIPMENT		
Transportation	2500	EA	\$4.00 / LM (Total Unit \$)		10000		10000	10000 CLCS-125 miles one way	
Disposal	20	T	\$110.00 / ton (Total Unit \$)		2200		2200	Offsite disposal of	
Disposal- drums	250	EA	\$40.00 /drum (Total Unit \$)		10000		10000	10000 debris, ie. railroad ties, wooden pallets,	
Total					22200		22200	battery casing, cupolas,	
Subcontractor @ 10% of Sub. Cost					2220		2220	pipng etc.	
Burden @ 13% of Labor Cost					0		0		
Labor @ 15% of Labor Cost					0		0		
Material @ 5% of Material Cost					0		0		
Total Project Costs (TDC)					24420		24420		
Indirects - 75% of Labor TDC					0		0		
Profit @ 10% of TDC					2442		2442		
Total					24420		26862		
Monitoring Level: C.P. 35					0		0		
Health & Safety Monitoring @ .10					2606		2606		
Total Field Cost (TFC)					29548		29548		
Contingency @ 20% of TFC					5910		5910		
Engineering @ 5% of TFC					1477		1477		
CAPITAL COST THIS PAGE					36935		36935		

ORIGINAL
(red)

AR000803

MILL CREEK
Groundwater Treatment
System
(HILLGTS)

ITEM	QUANTITY	DIRECT UNIT PRICE			DIRECT UNIT COST			ITEM PRICE COST	COMMENTS
		MATERIALS	LABOR	EQUIPMENT	MATERIALS	LABOR	EQUIPMENT		
1. Equipment									
a. Neutralization Tank	1 EA	\$6500.00	\$600.00		65.00	600		7100	
b. Neutralization Mixer	1 EA	\$6000.00	\$600.00		6000	600		6600	1. b. 7.5 HP
c. Clarifier	1 EA	\$143100.00	\$37100.00		143100	37100		180200	
d. Lime Feed System	1 EA	\$75000.00 (Total Unit \$)			75000			150000	
e. Clarifier Underflow Pumps	2 EA	\$4000.00	\$300.00		8000	600		8600	
f. Distribution Tank	1 EA	\$9000.00	\$800.00		9000	800		9800	
g. ReInjection Pumps	2 EA	\$3000.00	\$300.00		6000	600		6600	
h. Polymer feed System	1 EA	\$4500.00	\$400.00		4500	400		4900	
i. Carbon Filter	2 EA	\$110000.00	\$5000.00		220000	10000		230000	
j. Air Stripper	1 EA	\$100000.00	\$40000.00		100000	40000		140000	
k. Treat. Supply Pumps	2 EA	\$5000.00	\$300.00		10000	600		10600	
l. Piping	1400 LF	\$45.15	\$19.20		63210	26880		90090	
m. Treatment Building	1200 SF	\$30.00 (Total Unit \$)	\$26.00		36000		5798	36000	Treatment Building
n. Foundations	223 CY	\$200.00	\$385.00		44600	85855		136253	Building & Foundations.
5. Electrical									
a. Motor Starter #1	14 EA	\$800.00	\$200.00		11200	2800		14000	
b. Motor Starter #2	2 EA	\$1300.00	\$300.00		2600	600		3200	
c. Disconnect Switch	4 EA	\$800.00	\$200.00		3200	800		4000	
d. Transformer	1 EA	\$1200.00	\$500.00		1200	500		1700	
e. Conduit,Cable,Control	16 EA	\$455.00	\$680.00		7280	10880		18160	
f. Grounding/Hiring	2 LOT	\$6000.00	\$6000.00		12000	12000		24000	
Total					111000	231615	5798	1081803	
Subcontractor @ 10% of Sub. Cost					11100			11100	
Burden @ 13% of Labor Cost						30110		30110	
Labor @ 15% of Labor Cost						34742		34742	
Material @ 5% of Material Cost					36670			36670	
Total Direct Costs (TDC)					122100	770060		1194425	
Indirects 75% of Labor TDC						296467		272350	
Profit @ 10% of IDC						222350		119442	
Total					122100	770060	518616	1536218	
Working level: 0=.15								77823	
Health & Safety Monitoring @ .06								129123	
Total Field Cost (IFC)								1743163	
Contingency @ 20% of IFC								348633	
Engineering @ 5% of IFC								87158	
CAPITAL COST THIS PAGE								2178954	

ORIGINAL
(red)

AR000804

ORIGINAL
(red)

MILCHELIK
Groundwater Wells
Installation
(MILCHELIK)

ITEM	QUANTITY	DIRECT UNIT PRICE			DIRECT UNIT COST			ITEM DIRECT COST	COMMENTS
		MATERIALS	LABOR	EQUIPMENT	MATERIALS	LABOR	EQUIPMENT		
Pumps	23	EA	\$1500.00 (Total Unit \$)			34500	34500		
Extraction Wells	240	LF	\$60.00 (Total Unit \$)			14400	14400		
Injection Wells	200	LF	\$40.00 (Total Unit \$)			8000	8000		
Piping	4500	LF	\$8.50 (Total Unit \$)			38250	38250		
Total						95150	95150		
Subcontractor @ 10% of Sub. Cost						9515	9515		
Burden @ 13% of Labor Cost						0	0		
Labor @ 15% of Labor Cost						0	0		
Material @ 5% of Material Cost						0	0		
Total Direct Costs (IDC)						104665	104665		
Indirects 7% of Labor IDC						0	0		
Profit @ 10% of IDC						10467	10467		
Total						115132	115132		
Working Level: C, D, 35						0	0		
Health & Safety Monitoring @ .08						11513	11513		
Total Field Cost (IFC)						126645	126645		
Contingency @ 20% of IFC						25329	25329		
Engineering @ 5% of IFC						6332	6332		
CAPITAL COST THIS PAGE						158306	158306		

AR000805

HILLCHECK
 Stormwater Management System
 Alternative 5, 6, 7, 8, 9 & 10, 11, 12
 (MILLSMS2)

ITEM	QUANTITY	DIRECT UNIT PRICE			DIRECT UNIT COST			ITEM DIRECT COST	COMMENTS		
		MATERIALS	LABOR	EQUIPMENT	SUB.	MATERIALS	LABOR			EQUIPMENT	
Excavation	22900	CY	\$1.67	\$2.58		0	38243	59082	97325		
Clay- 2 ft.	7900	CY	\$9.00	\$7.47		71100	29704	59013	159817		
30 Mil Membrane	106000	SF	\$0.30	\$0.20		31800	21200	0	53000		
Sand/Gravel- 1 ft.	3900	CY	\$10.00	\$2.83		39000	4680	11037	54717		
Stone- 1 ft.	3900	CY	\$10.00	\$2.83		39000	4680	11037	54717	3-8 in. diameter	
Embankments	3120	CY	\$9.00	\$7.47		28000	11731	23306	63110		
Concrete Pipe- 15 in.	120	LF	\$6.20	\$0.48		744	374	58	1176		
Sheet Piling	280	SF	\$6.40	\$1.29		1792	361	417	2570		
Weir	4	EA	\$1000.00	\$500.00		4000	2000	0	6000		
Stone Riprap	280	CY	\$7.50	\$4.87		2100	1364	1380	4844		
Silt Fences	2300	LF	\$2.20	\$0.96		5060	5520	2208	12708		
Total						0	222676	119857	167539	510072	
Subcontractor @ 10% of Sub. Cost						0			0		
Burden @ 13% of Labor Cost							15581		15581		
Labor @ 15% of Labor Cost							17979		17979		
Material @ 5% of Material Cost						11134			11134		
Total Direct Costs (TDC)						0	233810	153417	167539	554766	
Indirects 75% of Labor TDC							115063		115063		
Profit @ 10% of TDC									55477		
Total						0	233810	268481	167539	725306	
Monitoring Level: D-15									65403		
Health & Safety Monitoring @ .08									63257		
Total Field Cost (IFC)									853965		
Contingency @ 20% of IFC									170793		
Engineering @ 5% of IFC									42698		
CAPITAL COST THIS PAGE									1067456		

ORIGINAL
(red)

AR000806

ORIGINAL
(red)

MILLER
Stormwater Management System Prewatering
Alternative 5,6,7,8 & 9, 10, 11, 12.
(MILLER)

ITEM	QUANTITY	DIRECT UNIT PRICE			DIRECT UNIT COST			ITEM DIRECT COST	COMMENTS
		MATERIALS	LABOR	EQUIPMENT	MATERIALS	LABOR	EQUIPMENT		
Dewatering Wells	35								35 wells @ 20' ea.
Blowing	700	LF	\$40.00 (total unit \$)		28000		28000		Two stormwater ponds
Well Screen	140	LF	\$8.00 (total unit \$)		1120		1120		will be constructed
Install Well Screen	350	LF	\$5.00 (total unit \$)		1750		1750		at a time. Therefore,
Gravel Pack- 8.72 cf/well	305	CF	\$4.00 (total unit \$)		1220		1220		some material will be
PVC Riser- 6 in.	140	LF	\$8.00 (total unit \$)		1120		1120		used twice.
Install PVC Riser	350	LF	\$4.00 (total unit \$)		1400		1400		
Pipe Manifold & Conductor	1000	LF	\$10.00 (total unit \$)		10000		10000		
Electric Cable	2000	LF	\$6.00 (total unit \$)		12000		12000		
Install & Pull Pumps	35	EA	\$700.00 (total unit \$)		24500		24500		
Pull Wells	35	EA	\$5.00 (total unit \$)		175		175		
Plug Wells	175	CF	\$30.00 (total unit \$)		5250		5250		
Wh/Whimb			\$5000.00 (total unit \$)		5000		5000		
Total					91535	0	0	91535	
Subcontractor @ 10% of Sub. Cost					9154		0	9154	
Burden @ 13% of Labor Cost					0		0	0	
Labor @ 15% of Labor Cost					0		0	0	
Material @ 5% of Material Cost					0		0	0	
Total Direct Costs (IDC)					100689	0	0	100689	
Indirects 75% of Labor IDC					0		0	0	
Profit @ 10% of IDC					0		0	0	
Total					100689	0	0	110757	
Working Level: D=.15								0	
Health & Safety Monitoring @ .10								11076	
Total Field Cost (IFC)								121833	
Contingency @ 20% of IFC								24367	
Engineering @ 10% of IFC								12183	
CAPITAL COST THIS PAGE								158383	

AR000807

ORIGINAL
(red)

HILLCREEK
Dewatering Area
Alternative 5, 6, 9, 10
(HELLEMMAT)

ITEM	QUANTITY	DIRECT UNIT PRICE				SUB.	DIRECT UNIT COST				ITEM DIRECT COST	COMMENTS	
		MATERIALS	LABOR	EQUIPMENT			MATERIALS	LABOR	EQUIPMENT				
Dewatering Pad													
Excavation	5100 CY	\$6.50	\$1.20	\$2.83			6120	14433			20553		
Sand	1680 CY	\$0.30	\$1.20	\$2.83		10920	2016	4754			17690		
30 Mil Membrane	45100 SF	\$1.50	\$1.20	\$2.83		13530	9020	0			22550		
Slag	1680 CY	\$1.50	\$1.20	\$2.83		2520	2016	4754			9290		
Construction Water Basin													
Excavation	1300 CY	\$9.00	\$1.20	\$2.83			1560	3679			5239		
Clay	400 CY	\$0.30	\$3.76	\$7.47		3600	1504	2988			8092		
30 Mil Membrane	5400 SF	\$1.50	\$1.20	\$2.83		1620	1080	0			2700		
Sand/Gravel	300 CY	\$2.25	\$1.20	\$2.83		1950	360	849			3159		
Sill Fences	450 LF	\$2.25	\$0.16			1013	72	0			1085		
Total						0	23748	31458			90358		
Subcontractor @ 10% of Sub. Cost						0					0		
Burden @ 13% of Labor Cost							3087				3087		
Labor @ 15% of Labor Cost							3562				3562		
Material @ 5% of Material Cost							1758				1758		
Total Direct Costs (IDC)						0	30397	31458			98765		
Indirects 75% of Labor IDC							22798				22798		
Profit @ 10% of IDC											9877		
Total						0	53196	31458			131440		
Working level: C,D=.35											29629		
Health & Safety Monitoring @ .10											16107		
Total Field Cost (TFC)											177176		
Contingency @ 20% of TFC											35435		
Engineering @ 5% of TFC											8859		
CAPITAL COST THIS PAGE											221469		

AR000808

ORIGINAL
(red)

PRESENT WORTH ANALYSIS

SITE: MILLCREEK
ALTERNATIVE NO.: 9
25832

COST COMPONENT	0	1	2	3	4	5	6	7	8	9	10	11	
1. CAPITAL COSTS	23269												
2. O & M COSTS	---	617											
3. ANNUAL COSTS	23269	617	617	194	194	194	194	194	194	194	194	194	
4. ANNUAL DISCOUNT RATE=10%	1	0.909	0.826	0.751	0.683	0.621	0.564	0.513	0.467	0.424	0.386	0.35	
PRESENT WORTH =	23269	561	510	146	133	120	109	100	91	82	75	68	

O & M COSTS	12	13	14	15	16	17	18	19	20	21	22	23	
ANNUAL DISCOUNT RATE=10%	0.319	0.29	0.263	0.239	0.218	0.198	0.18	0.164	0.149	0.135	0.123	0.112	
PRESENT WORTH =	62	56	51	46	42	38	35	32	29	26	24	22	

O & M COSTS	24	25	26	27	28	29	30						TOTAL PRESENT WORTH (000's)
ANNUAL DISCOUNT RATE=10%	0.101	0.092	0.084	0.076	0.069	0.063	0.057						=====
PRESENT WORTH =	20	18	16	15	13	12	11						25832
=====													

AR000809

SUMMARY OF SENSITIVITY ANALYSIS

(COST IN THOUSANDS)

COST FACTOR	BASELINE COST	SENSITIVITY FACTOR EXAMINED		
		LOW	HIGH	ORIGINAL
CAPITAL COSTS (\$):	23,269	19,637	25,671	(red)
PRESENT WORTH (\$):	25832	22199	28233	
ANNUAL COSTS (Year's)	1	617	617	617
	2	617	617	617
	3	194	194	194
	4			
	5			
	6			
	7			
	8			
	9			
	10			
	11			
	12			
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	30			
	31			

DRAFT
ORIGINAL
(red)

REMEDIAL ACTION ALTERNATIVE 10

AR000811

MH11CRLK
Excavation-Alternative JD
Offsite Disposal
(MH11FX9)

ITEM	QUANTITY	DIRECT UNIT PRICE			SUB.	DIRECT UNIT COST			ITEM DIRECT COST	COMMENTS
		MATERIALS	LABOR	EQUIPMENT		MATERIALS	LABOR	EQUIPMENT		
Excavation	12700	CY	\$1.67	\$2.58		0	21209	32766	53975	Southeast corner
Excavation	8100	CY	\$1.67	\$2.58		0	13527	20898	34425	Erosion control bench
Excavation	73900	CY	\$1.35	\$2.25		0	99765	166275	266040	
Excavation	450	CY	\$2.30	\$3.26		0	1035	1467	2502	Sediments from drained pond.
Bridge Swamp	6200	CY	\$4.19	\$5.05		0	25978	31310	57288	
Backfill Swamp	6200	CY	\$1.50	\$1.20		9300	7440	17546	34286	
Silt Fences	4100	LF	\$2.25	\$0.16		9225	656	0	9881	
Transportation	633400	LM	\$4.00 / LM	(Total Unit \$)	2533600				2533600	CECOS-125 miles one way
Disposal	81100	T	\$110.00 / ton	(Total Unit \$)	8921000				8921000	
Total					11454600	18525	169610	270262	11912997	
Subcontractor @ 10% of Sub. Cost					1145460				1145460	
Burden @ 13% of Labor Cost							22049		22049	
Labor @ 15% of Labor Cost							25442		25442	
Material @ 5% of Material Cost						926			926	
Total Direct Costs (TDC)					12600060	19451	217101	270262	13106874	
Indirects 75% of Labor IDC							162826		162826	
Profit @ 10% of IDC									1310687	
Total					12600060	19451	379926	270262	14580387	
Working Level: C=.7									455132	
Health & Safety Monitoring @ .06									902131	
Total Field Cost (TFC)									15937650	
Contingency @ 20% of TFC									3187530	
Engineering @ 5% of TFC									796683	
CAPITAL COST THIS PAGE									19922063	

ORIGINAL

(red)

AR000812

ORIGINAL
(red)

MILLCREEK
Soil/Membrane/Clay
Alternative 10
(MILLRC9)

ITEM	QUANTITY	DIRECT UNIT PRICE			SUB.	DIRECT UNIT COST			ITEM COST	COMMENTS
		MATERIALS	LABOR	EQUIPMENT		MATERIALS	LABOR	EQUIPMENT		
Clear & Grub	43		\$1010.00	\$1280.00		0	43430	55040	98470	
Grade	46300		\$0.66	\$3.11		0	30558	143993	174551	
Topsoil- 6 in.	34700	\$5.50	\$1.20	\$2.83		190850	41640	98201	330691	
Soil- 18 in.	104000	\$1.50	\$1.20	\$2.83		156000	124800	294320	575120	2. Common Bottom
Filter Fabric.	416200	\$1.15	\$0.16			478630	66592		545222	
Gravel- 12 in.	69400	\$10.00	\$1.20	\$2.83		694000	83280	196402	973682	
50 Mil Membrane	1873000	\$0.20	\$0.20		749200			1036089	749200	
Clay- 24 in.	138700	\$9.00	\$3.76	\$7.47		1248300	521512		2805901	
Chain Link fence	8400	\$9.65	(Total Unit \$)		81060				81060	
Revegetation	1870	\$24.60	\$5.60	\$4.45		46002	10472	8322	64796	
Total					830260	2813782	922284	1832367	6398693	
Subcontractor @ 10% of Sub. Cost					83026				83026	
Burden @ 13% of Labor Cost							119897		119897	
Labor @ 15% of Labor Cost							138343		138343	
Material @ 5% of Material Cost						140689			140689	
Total Direct Costs (TDC)					913286	2954471	1180524	1832367	6880647	
Indirects 75% of Labor TDC							885393		885393	
Profit @ 10% of TDC							688065		688065	
Total					913286	2954471	2065916	1832367	8454104	
Working Level: C, D= .35									1364399	
Health & Safety Monitoring @ .06									509110	
Total Field Cost (IFC)									10407614	
Contingency @ 20% of IFC									2081523	
Engineering @ 5% of IFC									520381	
CAPITAL COST THIS PAGE									13009517	

AR000813

ORIGINAL
(red)

HECKER
Monitoring Well
Installation
(WELL#11)

ITEM	QUANTITY	DIRECT UNIT PRICE			DIRECT UNIT COST			ITEM DIRLCT COST	COMMENTS
		MATERIALS	LABOR	EQUIPMENT	MATERIALS	LABOR	EQUIPMENT		
Monitoring Wells	100	IF \$80.00	(Total Unit \$)		14400		14400	1. 4 New Wells	
Total					14400		14400		
Subcontractor @ 10% of Sub. Cost					1440		1440		
Burden @ 1% of Labor Cost					0	0	0		
Labor @ 1% of Labor Cost					0	0	0		
Material @ 5% of Material Cost					0	0	0		
Total Direct Costs (IDC)					15840	0	15840		
Indirects 75% of labor IDC					0	0	0		
Profit @ 10% of IDC					1584	0	1584		
Total					15840	0	17424		
Working Level: C, D = .35					0	0	0		
Health & Safety Monitoring					1742	0	1742		
Total Field Cost (IFC)					19166	0	19166		
Contingency @ 20% of IFC					3833	0	3833		
Engineering @ 5% of IFC					958	0	958		
CAPITAL COST THIS PAGE					23958	0	23958		

AR000814

RELCREEK
Surface Water Treatment
System
(MUT-51)

ITEM	QUANTITY	DIRECT UNIT PRICE			DIRECT UNIT COST			ITEM DIRECT COST	COMMENTS
		MATERIALS	LABOR	EQUIPMENT	MATERIALS	LABOR	EQUIPMENT		
1. Equipment									
a. Neutralization tank	1	EA \$500.00	\$100.00		500	100		600	
b. Neutralization Mixer	1	EA \$800.00	\$200.00		800	200		1000	
c. Treat. Supply Pumps	2	EA \$1400.00	\$200.00		2800	400		3200	
d. Equalization tank	1	EA \$300.00	\$100.00		300	100		400	
e. Polymer Mix tank	1	EA \$300.00	\$100.00		300	100		400	
f. Piping	1000	LF \$12.00	\$5.90		12000	5900		17900	
2. Treatment Building	150	SF \$5.00	(Total Unit \$)					750	Treatment Building
3. Foundations	11	CV \$200.00	\$380.00	\$20.00	2200	4180		6380	Building & Foundations.
4. Sedimentation Basin	1	EA \$7000.00	\$7000.00	\$200.00		7000	200	7200	
5. Electrical									
a. Motor Starter #1	4	EA \$800.00	\$200.00		3200	800		4000	
b. Disconnect Switch	1	EA \$800.00	\$200.00		800	200		1000	
c. Conduit, Cable, Control	4	EA \$450.00	\$650.00		1800	2600		4400	
d. Grounding/Mixing	2	LOI \$500.00	\$500.00		1000	1000		2000	
Total					750	25700	200	49230	
Subcontractor @ 10% of Sub. Cost					75			75	
Builder @ 13% of Labor Cost						2935		2935	
Labor @ 15% of Labor Cost						3387		3387	
Material @ 5% of Material Cost					1285			1285	
Total Direct Costs (DDC)					825	26985	28902	56912	
Indirects 7.5% of Labor ID						21677		21677	
Profit @ 10% of DDC								5691	
Total					825	26985	50579	84280	
Building level: 0.15								7587	
Health & Safety Monitoring								9187	
at .10									
Total Field Cost (DFC)								101054	
Contingency @ 20% of DDC								20211	
Engineering @ 5% of DDC								5053	
CAPITAL COST THIS PAGE								126318	

ORIGINAL

(red)

PILEDRIPK

Surface debris
Offsite disposal
(PILEDRIPK)

ITEM	QUANTITY	DIRECT UNIT PRICE			DIRECT UNIT COST			ITEM DIRECT COST	COMMENTS
		MATERIALS	LABOR	EQUIPMENT	SUB.	MATERIALS	LABOR		
Transportation	2500	LM	\$4.00 / LM	(Total Unit \$)	10000			10000	CLCOS-125 miles one way
Disposal	20	T	\$110.00 / ton	(Total Unit \$)	2200			2200	Offsite disposal of
Disposal - drums	250	EA	\$40.00 / drum	(Total Unit \$)	10000			10000	debris, ie. railroad ties, wooden pallets, battery casing, cupolas, 2220 piping etc.
Total					22200			22200	
Subcontractor @ 10% of Sub. Cost					2220			0	
Burden @ 13% of Labor Cost					0			0	
Labor @ 15% of Labor Cost					0			0	
Material @ 5% of Material Cost					0			0	
Total Direct Costs (TDC)					24420			24420	
Indirects - 7.5% of Labor IDC					0			0	
Profit @ 10% of IDC					2442			2442	
Total					26862			26862	
Working level: C, D, 35					0			0	
Health & Safety Monitoring @ .10					2606			2606	
Total Field Cost (TFC)					29548			29548	
Contingency @ 20% of TFC					5910			5910	
Engineering @ 5% of TFC					1477			1477	
CAPITAL COST THIS PAGE					36935			36935	

AR000816

ORIGINAL

(red)

HILL CREEK
Groundwater Treatment
System
(MILLIGTS)

ITEM	QUANTITY	DIRECT UNIT PRICE			DIRECT UNIT COST			ITEM COST	COMMENTS
		MATERIALS	LABOR	EQUIPMENT	MATERIALS	LABOR	EQUIPMENT		
1. Equipment									
a. Neutralization Tank	1	EA \$6500.00	\$600.00		6500	600		7100	
b. Neutralization Mixer	1	EA \$6000.00	\$600.00		6000	600		6600	
c. Clarifier	1	EA \$143100.00	\$37100.00		143100	37100		180200	
d. Lime Feed System	1	EA \$75000.00	(Total Unit \$)		75000			150000	
e. Clarifier Underflow Pumps	2	EA \$4000.00	\$360.00		8000	600		8600	
f. Distribution Tank	1	EA \$9000.00	\$800.00		9000	800		9800	
g. ReInjection Pumps	2	EA \$3000.00	\$300.00		6000	600		6600	
h. Polymer Feed System	1	EA \$4500.00	\$400.00		4500	400		4900	
i. Carbon Filter	2	EA \$110000.00	\$5600.00		220000	10000		230000	
j. Air Stripper	1	EA \$100000.00	\$40000.00		100000	40000		140000	
k. Treat. Supply Pumps	2	EA \$5000.00	\$300.00		10000	600		10600	
l. Piping	1400	LF \$45.15	\$19.20		63210	26800		90090	
3. Treatment Building	1200	SF \$30.00	(Total Unit \$)		36000			36000	
4. Foundations	223	CY \$200.00	\$385.00	\$26.00	44600	85855	5798	136253	
5. Electrical								Treatment Building Building & Foundations.	
a. Motor Starter #1	14	EA \$800.00	\$200.00		11200	2800		14000	
b. Motor Starter #2	2	EA \$1300.00	\$300.00		2600	600		3200	
c. Disconnect Switch	4	EA \$800.00	\$200.00		3200	800		4000	
d. Transformer	1	EA \$1200.00	\$500.00		1200	500		1700	
e. Conduit, Cable, Control	16	EA \$455.00	\$680.00		7280	10880		18160	
f. Grounding/Hiring	2	LOT \$6000.00	\$6000.00		12000	12000		24000	
Total					111000	231615	5798	1081803	
Subcontractor @ 10% of Sub. Cost					11100			11100	
Burden @ 13% of Labor Cost						30110		30110	
Labor @ 15% of Labor Cost						34742		34742	
Material @ 5% of Material Cost						36670		36670	
Total Direct Costs (TDC)					122100	296467		1194425	
Indirects 75% of Labor TDC						222350		222350	
Profit @ 10% of TDC								119442	
Total					122100	770060	518616	1536216	
Working level: D=.15								77823	
Health & Safety Monitoring @ .06								129123	
Total Field Cost (TFC)								1743163	
Contingency @ 20% of TFC								348633	
Engineering @ 5% of TFC								87158	
CAPITAL COST THIS PAGE								2178954	

AR000817

ORIGINAL
(red)

MILLCREEK
Groundwater Wells
Installation
(BILGIBELL)

ITEM	QUANTITY	DIRECT UNIT PRICE			DIRECT UNIT COST			ITEM DIRECT COST	COMMENTS
		MATERIALS	LABOR	EQUIPMENT	SUR.	MATERIALS	LABOR		
Pump	23	1A	\$1500.00 (Total Unit \$)		34500			34500	
Extraction Wells	240	LF	\$60.00 (Total Unit \$)		14400			14400	
Injection Wells	200	LF	\$40.00 (Total Unit \$)		8000			8000	
Piping	4500	LF	\$8.50 (Total Unit \$)		38250			38250	
Total					95150			95150	
Subcontractor @ 10% of Sub. Cost					9515			9515	
Burden @ 1.5% of Labor Cost					0			0	
Labor @ 15% of Labor Cost					0			0	
Material @ 5% of Material Cost					0			0	
Total Direct Costs (IDC)					104665	0	0	104665	
Indirects, 7.5% of Labor IDC					0	0	0	0	
Profit @ 10% of IDC					0	0	0	0	
Total					104665	0	0	104665	
Booing Level: C.P. .35					0	0	0	0	
Health & Safety Monitoring @ .08					0	0	0	0	
Total Field Cost (IFC)					104665	0	0	104665	
Contingency @ 20% of IFC					0	0	0	0	
Engineering @ 5% of IFC					0	0	0	0	
CAPITAL COST THIS PAGE					0	0	0	0	
					126645			126645	
					25329			25329	
					6337			6337	
					158306			158306	

AR000818

HILL CREEK
 Stormwater Management System
 Alternative 5, 6, 7, 8, 9 & 10, 11, 12
 (MILLSMS2)

ITEM	QUANTITY	DIRECT UNIT PRICE			DIRECT UNIT COST			ITEM DIRECT COST	COMMENTS
		MATERIALS	LABOR	EQUIPMENT	SUB.	MATERIALS	LABOR		
Excavation	22900	CY	\$1.67	\$2.58	0	38243	59082	97325	
Clay- 2 ft.	7900	CY	\$3.76	\$7.47	71100	29704	59013	159817	
10 Mil Membrane	106000	SF	\$0.30	\$0.20	31800	21200	0	53000	
Sand/Gravel- 1 ft.	3900	CY	\$10.00	\$2.83	39000	4680	11037	54717	
Stone- 1 ft.	3900	CY	\$10.00	\$2.83	39000	4680	11037	54717	3-8 in. diameter
Embankments	3120	CY	\$9.00	\$7.47	28080	11731	23306	63118	
Concrete Pipe- 15 in.	120	LF	\$6.70	\$0.48	744	374	58	1176	
Sheet Piling	280	SF	\$6.40	\$1.49	1792	361	417	2570	
Weir	4	EA	\$1000.00	\$500.00	4000	2000	0	6000	
Stone Riprap	280	CY	\$7.50	\$4.87	2100	1364	1380	4844	
Silt fences	2300	LF	\$2.20	\$0.96	5060	5520	2208	12788	
Total					0	222676	167539	510072	
Subcontractor @ 10% of Sub. Cost					0			0	
Burden @ 13% of Labor Cost						15581		15581	
Labor @ 15% of Labor Cost						17979		17979	
Material @ 5% of Material Cost						11134		11134	
Total Direct Costs (TDC)					0	233810	167539	554766	
Indirects 75% of Labor TDC						115063		115063	
Profit @ 10% of TDC								55477	
Total					0	233810	167539	725306	
Monitoring level: 0.15								65403	
Health & Safety Monitoring @ .08								63257	
Total Field Cost (TFC)								853965	
Contingency @ 20% of TFC								170793	
Engineering @ 5% of TFC								42698	
CAPITAL COST THIS PAGE								1067456	

ORIGINAL

(red)

MILL CREEK
 Stormwater Management System Dewatering
 Alternative 5, 6, 7, 8 & 9, 10, 11, 12
 (MILLIDIM)

ITEM	QUANTITY	DIRECT UNIT PRICE			DIRECT UNIT COST			ITEM DIRECT COST	COMMENTS
		MATERIALS	LABOR	EQUIPMENT	MATERIALS	LABOR	EQUIPMENT		
Dewatering Wells	35								35 wells @ 20' ea.
Boring	700	LF	\$40.00 (total unit \$)				28000		Two stormwater ponds
Well Screen	140	LF	\$8.00 (total unit \$)				1120		will be constructed
Install Well Screen	350	LF	\$5.00 (total unit \$)				1750		at a time. Therefore,
Gravel Pack - 8.72 c/well	305	LF	\$4.00 (total unit \$)				1220		some material will be
PVC Riser - 6 in.	140	LF	\$8.00 (total unit \$)				1120		used twice.
Install PVC Riser	350	LF	\$4.00 (total unit \$)				1400		
Pipe Manifold & Conductor	1000	LF	\$10.00 (total unit \$)				10000		
Electric Cable	2000	LF	\$6.00 (total unit \$)				12000		
Install & Pull Pumps	35	EA	\$700.00 (total unit \$)				24500		
Pull Wells	35	EA	\$5.00 (total unit \$)				175		
Plug Wells	175	CF	\$30.00 (total unit \$)				5250		
Prob/Demob			\$5000.00 (total unit \$)				5000		
Total							91535		
Subcontractor @ 10% of Sub. Cost							9154		
Burden @ 13% of Labor Cost							0		
Labor @ 15% of Labor Cost							0		
Material @ 5% of Material Cost							0		
Total Direct Costs (TDC)							100689		
Indirects 75% of Labor TEC							0		
Profit @ 10% of IDC							10069		
Total							110757		
Murking Level: 0=.15							0		
Health & Safety Monitoring @ .10							11076		
Total Field Cost (IFC)							121833		
Contingency @ 20% of IFC							24367		
Engineering @ 10% of IFC							12183		
CAPITAL COST THIS PAGE							158383		

AR000820

ORIGINAL
(red)

PRESENT WORTH ANALYSIS

SITE: MILICEEK
ALTERNATIVE NO.: 10
39211

COST COMPONENT	COST/YEAR COST OCCURS (\$000's)											
	0	1	2	3	4	5	6	7	8	9	10	11
1. CAPITAL COSTS	36713											
2. O & M COSTS	---											
3. ANNUAL COSTS	36713	611	611	187	187	187	187	187	187	187	187	187
4. ANNUAL DISCOUNT RATE=10%	1	0.909	0.826	0.751	0.683	0.621	0.564	0.513	0.467	0.424	0.386	0.35
PRESENT WORTH =	36713	555	505	140	128	116	105	96	87	79	72	65

O & M COSTS	187	13	14	15	16	17	18	19	20	21	22	23
ANNUAL DISCOUNT RATE=10%	0.319	0.29	0.263	0.239	0.218	0.198	0.18	0.164	0.149	0.135	0.123	0.112
PRESENT WORTH =	60	54	49	45	41	37	34	31	28	25	23	21

O & M COSTS	187	25	26	27	28	29	30					
ANNUAL DISCOUNT RATE=10%	0.101	0.092	0.084	0.076	0.069	0.063	0.057					
PRESENT WORTH =	19	17	16	14	13	12	11					
=====												
TOTAL PRESENT WORTH (000's)	39211											
=====												

AR000821

KAAIU

SUMMARY OF SENSITIVITY ANALYSIS

(Cost in thousands)

COST FACTOR	BASELINE COST	SENSITIVITY FACTOR EXAMINED		
		LOW	HIGH	
CAPITAL COSTS (\$):	36,713	27,409	46,379	
PRESENT WORTH (\$):	39,211	29,907	48,877	
ANNUAL COSTS (\$/YEAR)	1	611	611	611
	2	611	611	611
	3	187	187	187
	4			
	5			
	6			
	7			
	8			
	9			
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ORIGINAL
(red)

ORIGINAL
DRAFT
(red)

REMEDIAL ACTION ALTERNATIVE 11

AR000823

ORIGINAL

(red)

MILLCRLEK
 Excavation-Alternative (1)
 Offsite Disposal
 (MILLEX10)

ITEM	QUANTITY	DIRECT UNIT PRICE			SUB.	DIRECT UNIT COST			ITEM DIRECT COST	COMMENTS
		MATERIALS	LABOR	EQUIPMENT		MATERIALS	LABOR	EQUIPMENT		
Excavation	12700	CY	\$1.67	\$2.58	0	21209	32766	53975	53975	Southeast corner
Excavation	8100	CY	\$1.67	\$2.58	0	13527	20898	34425	34425	Erosion control bench
Excavation	907500	CY	\$1.35	\$2.25		1225125	2041875	3267000	3267000	
Backfill Excavation	423500	CY	\$1.50	\$2.83	635250	508200	1198505	2341955	2341955	
Excavation	450	CY	\$2.30	\$3.26	0	1035	1467	2502	2502	Sediments from drained pond.
Dredge Swamp	6200	CY	\$4.19	\$5.05	0	25978	31310	57288	57288	
Backfill Swamp	6200	CY	\$1.20	\$2.83	9300	7440	17546	34286	34286	
Silt Fences	4100	LF	\$2.25	\$0.16	9225	656	0	9881	9881	
Transportation	5671900	LM	\$4.00 / LM	(Total Unit \$)	22687600			22687600	22687600	CECOS-125 miles one way
Disposal	726000	T	\$110.00 / ton	(Total Unit \$)	79860000			79860000	79860000	
Total					102547600	1803170	3344367	108348912	108348912	
Subcontractor @ 10% of Sub. Cost					10254760			10254760	10254760	
Burden @ 13% of Labor Cost						234412		234412	234412	
Labor @ 15% of Labor Cost						270476		270476	270476	
Material @ 5% of Material Cost						32689		32689	32689	
Total Direct Costs (IDC)					112802360	686464	3344367	119141248	119141248	
Indirects 75% of Labor IDC						1731043		1731043	1731043	
Profit @ 10% of IDC						11914125		11914125	11914125	
Total					112802360	686464	3344367	132786416	132786416	
Hoisting Level: C,D=.35								2584214	2584214	
Health & Safety Monitoring @ .06								8122238	8122238	
Total Field Cost (IFC)								143492868	143492868	
Contingency @ 20% of IFC								28698574	28698574	
Engineering @ 5% of IFC								7174643	7174643	
CAPITAL COST THIS PAGE								179366085	179366085	

AR000824

ORIGINAL

(red)

MILLCREEK
Soil Cover
Alternative A
(MISOIL)

ITEM	QUANTITY	DIRECT UNIT PRICE			SUB.	DIRECT UNIT COST			ITEM COST	COMMENTS
		MATERIALS	LABOR	EQUIPMENT		MATERIALS	LABOR	EQUIPMENT		
Clear & Grub	75	AC	\$1010.00	\$1280.00		0	75750	96000	171750	
Topsoil- 6 in.	60500	CY	\$5.50	\$1.20		332750	72600	171215	576565	
Soil- 18 in.	121000	CY	\$1.50	\$1.20		181500	145200	342430	669130	
Chain Link Fence- 6 ft.	8400	LF	\$9.65	Total Cost	81060				81060	
Revegetation	3270	MSF	\$24.60	\$5.60		80442	18312	14552	113306	
Total					81060	594692	311862	624197	1611811	
Subcontractor @ 10% of Sub. Cost					8106				8106	
Burden @ 13% of Labor Cost							40542		40542	
Labor @ 15% of Labor Cost							46779		46779	
Material @ 5% of Material Cost						29735			29735	
Total Direct Costs (TDC)					89166	624427	399183	624197	1736972	
Indirects 75% of Labor TDC							299388		299388	
Profit @ 10% of IDC									173697	
Total					89166	624427	698571	624197	2210057	
Working Level: D=.15									198415	
Health & Safety Monitoring @ .08									144508	
Total Field Cost (TFC)									2552981	
Contingency @ 20% of TFC									510596	
Engineering @ 5% of TFC									127649	
CAPITAL COST THIS PAGE									3191226	

AR000825

ORIGINAL
(red)

MILLCREEK
Monitoring Well
Installation
(MILLCREEK)

ITEM	QUANTITY	DIRECT UNIT PRICE				SUB.	DIRECT UNIT COST				ITEM DIRECT COST	COMMENTS
		MATERIALS	LABOR	EQUIPMENT	(Total Unit \$)		MATERIALS	LABOR	EQUIPMENT			
Monitoring Wells	140	LF	\$80.00	(Total Unit \$)	14400	14400						1. 4 New Wells
Total					14400	14400						
Subcontractor @ 10% of Sub. Cost					1440							
Burden @ 13% of Labor Cost					0	0						
Labor @ 15% of Labor Cost					0	0						
Material @ 5% of Material Cost					0	0						
Total Direct Costs (TDC)					15840	0	0	0	0	15840		
Indirects 7.5% of Labor TDC					0	0				0		
Profit @ 10% of TDC					0	0				1584		
Total					15840	0	0	0	0	17424		
Working Level: C, P, 35												
Health & Safety Monitoring @ .08										1742		
Total Field Cost (TFC)										19166		
Contingency @ 20% of TFC										3833		
Engineering @ 5% of TFC										958		
CAPITAL COST THIS PAGE										23958		

AR000826

ORIGINAL

(red)

BLUEPRINT
 Surface Water Treatment
 System
 (RUE-841)

ITEM	QUANTITY	DIRECT UNIT PRICE				DIRECT UNIT COST			ITEM DIRECT COST	COMMENTS
		MATERIALS	LABOR	EQUIPMENT	SUB.	MATERIALS	LABOR	EQUIPMENT		
1. Equipment										
a. Neutralization Tank	1	EA \$500.00	\$100.00			500	100	600		
b. Neutralization Mixer	1	EA \$800.00	\$200.00			800	200	1000		
c. Treat. Supply Pumps	2	EA \$1400.00	\$200.00			2800	400	3200		
d. Equalization Tank	1	EA \$300.00	\$100.00			300	100	400		
e. Polymer Mix Tank	1	EA \$300.00	\$100.00			300	100	400		
f. Piping	1000	LF \$12.00	\$5.90			12000	5900	17900		
g. Treatment Building	150	SF \$5.00	(Total Unit \$)		750	2200	4180	7500		750 Treatment Building
h. Foundations	11	CY \$200.00	\$380.00	\$20.00		2200	4180	6380		Building & Foundations.
i. Sedimentation Basin	1	EA \$7000.00	\$7000.00	\$200.00		7000	200	7200		
j. Electrical										
a. Motor Starter #1	4	EA \$800.00	\$200.00			3200	800	4000		
b. Disconnect Switch	1	EA \$800.00	\$200.00			800	200	1000		
c. Conduit, Cable, Control	4	EA \$450.00	\$650.00			1800	2600	4400		
d. Grounding/Mixing	2	LOI \$500.00	\$500.00			1000	1000	2000		
Total						750	22580	49230		
Subcontractor @ 10% of Sub. Cost						75		75		
Burden @ 13% of Labor Cost							2935	2935		
Labor @ 15% of Labor Cost							3387	3387		
Material @ 5% of Material Cost						1285		1285		
Total Direct Costs (DDC)						825	26985	56912		
Indirects 75% of Labor ID							21677	21677		
Profit @ 10% of DD								5691		
Total						825	26985	64200		
Working Level: D .15								7587		
Health & Safety Monitoring								9167		
at .10										
Total Field Cost (FFC)								101054		
Contingency @ 20% of FFC								20211		
Engineering @ 5% of FFC								5053		
CAPITAL COST TOTAL PAGE								126318		

AR000827

ORIGINAL
(red)

ITEM	DIRECT UNIT PRICE			DIRECT UNIT COST			ITEM DIRECT COST	COMMENTS
	QUANTITY	MATERIALS	LABOR	EQUIPMENT	SUB.	MATERIALS		
Transportation	2500 EA	\$4.00 / EA			10000			10000 CECOS-125 miles one way
Disposal	70 EA	\$110.00 / ton (Total Unit \$)			2200			2200 Offsite disposal of
Disposal - drums	750 EA	\$40.00 / drum (Total Unit \$)			10000			10000 debris, ie. railroad ties, wooden pallets, 22200 battery casing, cupolas, 7220 piping etc.
Total					22200			
Subcontractor @ 10% of Sub. Cost					2220			
Bond @ 1% of Labor Cost							0	
Labor @ 15% of Labor Cost							0	
Material @ 5% of Material Cost							0	
Total Direct Costs (IHC)					24420		24420	
Indirects, 75% of Labor IHC							0	
Profit @ 10% of IHC							2442	
Total					24420		26862	
Working Level: 4.0-35							0	
Health & Safety Monitoring @ .10							2686	
Total Field Cost (IHC)							29548	
Contingency @ 20% of IHC							5910	
Engineering @ 5% of IHC							1477	
CAPITAL COST THIS PAGE							36935	

AR000828

ORIGINAL

(red)

MILLCREEK
Groundwater Treatment
System
(MILIGTS)

ITEM	QUANTITY	DIRECT UNIT PRICE			DIRECT UNIT COST			ITEM DIRECT COST	COMMENTS
		MATERIALS	LABOR	EQUIPMENT	MATERIALS	LABOR	EQUIPMENT		
1. Equipment									
a. Neutralization Tank	1 EA	\$6500.00	\$600.00		6500	600		7100	
b. Neutralization Mixer	1 EA	\$6000.00	\$600.00		6000	600		6600	
c. Clarifier	1 EA	\$143100.00	\$37100.00		143100	37100		180200	
d. Time Feed System	1 EA	\$75000.00	(Total Unit \$)		75000			150000	
e. Clarifier Underflow Pumps	2 EA	\$4000.00	\$300.00		8000	600		8600	
f. Distribution Tank	1 EA	\$9000.00	\$800.00		9000	800		9800	
g. ReInjection Pumps	2 EA	\$3000.00	\$300.00		6000	600		6600	
h. Polymer Feed System	1 EA	\$4500.00	\$400.00		4500	400		4900	
i. Carbon Filter	2 EA	\$110000.00	\$5000.00		220000	10000		230000	
j. Air Stripper	1 EA	\$100000.00	\$40000.00		100000	40000		140000	
k. Treat. Supply Pumps	2 EA	\$5000.00	\$300.00		10000	600		10600	
l. Piping	1400 LF	\$45.15	\$19.20		63210	26880		90090	
3. Treatment Building	1200 SF	\$30.00	(Total Unit \$)		36000			36000	
4. Foundations	223 CY	\$200.00	\$385.00	\$26.00	44600	85855	5798	136253	
5. Electrical									
a. Motor Starter #1	14 EA	\$800.00	\$200.00		11200	2800		14000	
b. Motor Starter #2	2 EA	\$1300.00	\$300.00		2600	600		3200	
c. Disconnect Switch	4 EA	\$800.00	\$200.00		3200	800		4000	
d. Transformer	1 EA	\$1200.00	\$500.00		1200	500		1700	
e. Conduit,Cable,Control	16 EA	\$455.00	\$680.00		7280	10880		18160	
f. Grounding/Wiring	2 LOT	\$6000.00	\$6000.00		12000	12000		24000	
Total					111000	231615	5798	1081803	
Subcontractor @ 10% of Sub. Cost					11100			11100	
Burden @ 13% of Labor Cost						30110		30110	
Labor @ 15% of Labor Cost						34742		34742	
Material @ 5% of Material Cost					36670			36670	
Total Direct Costs (IDC)					122100	770060	296467	1194425	
Indirects 75% of Labor IDC						222350		222350	
Profit @ 10% of IDC								119442	
Total					122100	770060	518618	1536218	
Working level: D=15								77823	
Health & Safety Monitoring @ .06								129123	
Total Field Cost (IFC)								1743163	
Contingency @ 20% of IFC								348633	
Engineering @ 5% of IFC								87158	
CAPITAL COST THIS PAGE								2174954	

AR000829

ORIGINAL

(red)

HILICREK
Groundwater Wells
Installation
(HILICREK)

ITEM	QUANTITY	DIRECT UNIT PRICE			DIRECT UNIT COST			ITEM DIRECT COST	COMMENTS
		MATERIALS	LABOR	EQUIPMENT	MATERIALS	LABOR	EQUIPMENT		
Pumps	23	IA \$1500.00 (Total Unit \$)			34500			34500	
Extraction Wells	240	LF \$60.00 (Total Unit \$)			14400			14400	
Injection Wells	200	LF \$40.00 (Total Unit \$)			8000			8000	
Piping	4500	LF \$8.50 (Total Unit \$)			38250			38250	
Total					95150			95150	
Subcontractor @ 10% of Sub. Cost					9515			9515	
Burden @ 13% of Labor Cost					0	0		0	
Labor @ 15% of Labor Cost					0	0		0	
Material @ 5% of Material Cost					0	0		0	
Total Direct Costs (IDC)					104665	0	0	104665	
Indirects, 75% of Labor IDC					0	0		0	
Profit @ 10% of IDC					104665	0	0	104665	
Total					104665	0	0	115132	
Working Level: C, D .35								0	
Health & Safety Monitoring @ .08								11513	
Total Field Cost (IFC)								126645	
Contingency @ 20% of IFC								25329	
Engineering @ 5% of IFC								6332	
CAPITAL COST THIS PAGE								158306	

AR000830

ORIGINAL

(red)

HILLCREEK
Stormwater Management System
Alternative 5, 6, 7, 8, 9 & 10 - J
(MILSMS?)

ITEM	QUANTITY	DIRECT UNIT PRICE			DIRECT UNIT COST			ITEM COST	COMMENTS
		MATERIALS	LABOR	EQUIPMENT	MATERIALS	LABOR	EQUIPMENT		
Excavation	22900	CY	\$1.67	\$2.58	0	38243	59082	97325	
Clay- 2 ft.	7900	CY	\$3.76	\$7.47	71100	29704	59013	159817	
30 Mil Membrane	106000	SF	\$0.30	\$0.20	31800	21200	0	53600	
Sand/Gravel- 1 ft.	3900	CY	\$10.00	\$2.83	39000	4680	11037	54717	
Stone- 1 ft.	3900	CY	\$10.00	\$2.83	39000	4680	11037	54717	3-8 in. diameter
Embarkments	3120	CY	\$9.00	\$7.47	28080	11731	23306	63118	
Concrete Pipe- 15 in.	120	LF	\$6.20	\$0.48	744	374	58	1176	
Sheet Piling	280	SF	\$6.40	\$1.49	1792	361	417	2570	
Refr	4	EA	\$1000.00	\$500.00	4000	2000	0	6000	
Stone Riprap	280	CY	\$7.50	\$4.87	2100	1364	1380	4844	
Silt fences	2300	LF	\$2.20	\$0.96	5060	5520	2208	12708	
Total					0	119857	167539	510072	
Subcontractor @ 10% of Sub. Cost					0			0	
Burden @ 13% of Labor Cost						15581		15581	
Labor @ 15% of Labor Cost						17979		17979	
Material @ 5% of Material Cost						11134		11134	
Total Direct Costs (TDC)					0	153417	167539	554766	
Indirects 75% of Labor TDC						115063		115063	
Profit @ 10% of TDC								55477	
Total					0	268481	167539	725306	
Working level: 0-.15								65403	
Health & Safety Monitoring @ .08								63257	
Total Field Cost (TFC)								853965	
Contingency @ 20% of TFC								170793	
Engineering @ 5% of TFC								42698	
CAPITAL COST THIS PAGE								1067456	

AR000831

MILLCREEK
Stormwater Management System Dewatering
Alternative 5,6,7,8 & 9, 11, 12, 13
(REVISION)

ITEM	QUANTITY	DIRECT UNIT PRICE			DIRECT UNIT COST			ITEM DIRECT COST	COMMENTS
		MATERIALS	LABOR	EQUIPMENT	MATERIALS	LABOR	EQUIPMENT		
Dewatering Wells	35								35 wells @ 20' ea.
Boring	700	LF	\$40.00 (total unit \$)		28000		28000		Two stormwater ponds
Well Screen	140	LF	\$8.00 (total unit \$)		1120		1120		will be constructed
Install Well Screen	350	LF	\$5.00 (total unit \$)		1750		1750		at a time. Therefore,
Gravel Pack- 8.72 cf/well	305	CF	\$4.00 (total unit \$)		1220		1220		some material will be
PVC Riser- 6 in.	140	LF	\$8.00 (total unit \$)		1120		1120		used twice.
Install PVC Riser	350	LF	\$4.00 (total unit \$)		1400		1400		
Pipe Manifold & Conductor	1000	LF	\$10.00 (total unit \$)		10000		10000		
Electric Cable	2000	LF	\$6.00 (total unit \$)		12000		12000		
Install & Pull Pumps	35	EA	\$700.00 (total unit \$)		24500		24500		
Pull Wells	35	EA	\$5.00 (total unit \$)		175		175		
Plug Wells	175	CF	\$30.00 (total unit \$)		5250		5250		
Mob/Itemob			\$5000.00 (total unit \$)		5000		5000		
Total					91535	0	0	91535	
Subcontractor @ 10% of Sub. Cost					9154	0	0	9154	
Burden @ 13% of Labor Cost					0	0	0	0	
Labor @ 15% of Labor Cost					0	0	0	0	
Material @ 5% of Material Cost					0	0	0	0	
Total Direct Costs (IDC)					100689	0	0	100689	
Indirects 75% of Labor IDC					0	0	0	0	
Profit @ 10% of IDC					0	0	0	10069	
Total					100689	0	0	110757	
Working Level: D=.15					0	0	0	0	
Health & Safety Monitoring @ .10					0	0	0	11076	
Total Field Cost (IFC)								121833	
Contingency @ 20% of IFC								24367	
Engineering @ 10% of IFC								12183	
CAPITAL COST THIS PAGE								158383	

SITE: MILLCREEK
 ALTERNATIVE NO.: 11
 187203

PRESENT WORTH ANALYSIS

COST COMPONENT	COST/YEAR COST OCCURS (\$000's)											
	0	1	2	3	4	5	6	7	8	9	10	11
1. CAPITAL COSTS	186143											
2. O & M COSTS	---	611										
3. ANNUAL COSTS	186143	611	611	0	0	0	0	0	0	0	0	0
4. ANNUAL DISCOUNT RATE=10%	1	0.909	0.826	0.751	0.683	0.621	0.564	0.513	0.467	0.424	0.386	0.35
PRESENT WORTH = 186143	555	505										

U & M COSTS	12	13	14	15	16	17	18	19	20	21	22	23
ANNUAL DISCOUNT RATE=10%	0	0	0	0	0	0	0	0	0	0	0	0
PRESENT WORTH =	0.319	0.29	0.263	0.239	0.218	0.198	0.18	0.164	0.149	0.135	0.123	0.112

U & M COSTS	24	25	26	27	28	29	30					
ANNUAL DISCOUNT RATE=10%	0	0	0	0	0	0	0					
PRESENT WORTH =	0.101	0.092	0.084	0.076	0.069	0.063	0.057					

TOTAL PRESENT WORTH (\$000's)	0	0	0	0	0	0	0	0	0	0	0	0
PRESENT WORTH =	0	0	0	0	0	0	0	0	0	0	0	0
=====												
PRESENT WORTH =	187203											
=====												

RAA 11

SUMMARY OF SENSITIVITY ANALYSIS

(cost in thousands)

COST FACTOR	BASELINE COST	SENSITIVITY FACTOR EXAMINED		
		LOW	HIGH	
CAPITAL COSTS (\$):	186,143	130,921	241,512	
PRESENT WORTH (\$):	187,203	131,982	242,572	
ANNUAL COSTS /year S:	1	611	611	611
	2	611	611	611
	3			
	4			
	5			
	6			
	7			
	8			
	9			
	10			
	11			
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AR000834

ORIGINAL
(red)

ORIGINAL
DRAFT
(red)

REMEDIAL ACTION ALTERNATIVE 12

AR000835

ORIGINAL
(red)

HEILBRICK
Monitoring Well
Installation
(MHW111)

ITEM	QUANTITY	DIRECT UNIT PRICE			DIRECT UNIT COST			ITEM DIRECT COST	COMMENTS
		LF	MATERIALS	LABOR	EQUIPMENT	SUB.	MATERIALS		
Monitoring Wells	180	\$80.00				14400		14400	1. 4 New Wells
Total						14400		14400	
Subcontractor @ 10% of Sub. Cost						1440		1440	
Burden @ 1% of Labor Cost						0	0	0	
Labor @ 1% of Labor Cost						0	0	0	
Material @ 5% of Material Cost						0	0	0	
Total Direct Costs (IDC)						15840	0	15840	
Indirects 7.5% of Labor IDC						0	0	0	
Profit @ 10% of IDC						1584	0	1584	
Total						17424	0	17424	
Working Level: C.A.= .35								1742	
Health & Safety Monitoring @ .08								19166	
Total Field Cost (TFC)								3033	
Contingency @ 20% of TFC								958	
Engineering @ 5% of TFC								23958	

CAPITAL COST THIS PAGE

AR000836

ORIGINAL
(red)

RECHERF
Surface Water Treatment
System
(HILLTOP)

ITEM	QUANTITY	DIRECT UNIT PRICE			DIRECT UNIT COST			ITEM DIRECT COST	COMMENTS
		MATERIALS	LABOR	EQUIPMENT	MATERIALS	LABOR	EQUIPMENT		
1. Equipment									
a. Neutralization Tank	1	EA \$500.00	\$100.00		500	100		600	
b. Neutralization Mixer	1	EA \$800.00	\$200.00		800	200		1000	
c. Treat. Supply Pumps	2	EA \$1400.00	\$200.00		2800	400		3200	
d. Equalization Tank	1	EA \$300.00	\$100.00		300	100		400	
e. Polymer Mix Tank	1	EA \$300.00	\$100.00		300	100		400	
2. Piping	1000	LF \$12.00	\$5.90		12000	5900		17900	
3. Treatment Building	150	SF \$5.00	(Total Unit \$)					750	750 Treatment Building
4. Foundations	11	CY \$200.00	\$380.00	\$20.00	2200	4180		6380	Building & Foundations.
5. Sedimentation Basin	1	EA	\$7000.00	\$200.00		7000	200	7200	
6. Electrical									
a. Motor Starter #1	4	EA \$400.00	\$200.00		1600	800		2400	
c. Disconnect Switch	1	EA \$800.00	\$200.00		800	200		1000	
c. Conduit, Cable, Control	4	EA \$450.00	\$650.00		1800	2600		4400	
d. Grounding/Mixing	2	LOI \$500.00	\$500.00		1000	1000		2000	
Total					750	25700	200	49230	
Subcontractor @ 10% of Sub. Cost					75			75	
Burden @ 13% of Labor Cost						2935		2935	
Labor @ 15% of Labor Cost						3387		3387	
Material @ 5% of Material Cost					1285			1285	
Total Direct Costs (TDC)					825	26985	28902	56912	
Indirects 75% of Labor TD						21677		21677	
Profit @ 10% of TDC								5691	
Total					825	26985	50579	84280	
Working Level: D. 15								7587	
Health & Safety Monitoring at .10								9187	
Total Field Cost (TFC)								101054	
Contingency @ 20% of TFC								20211	
Engineering @ 5% of TFC								5053	
CAPITAL COST HILL PACI								126318	

AR000837

MILLERIK
Surface Debris
Offsite Disposal
(RECYCLES)

ITEM	QUANTITY	DIRECT UNIT PRICE			DIRECT UNIT COST			ITEM DIRECT COST	COMMENTS
		MATERIALS	LABOR	EQUIPMENT	MATERIALS	LABOR	EQUIPMENT		
Transportation	2500	LH	\$4.00 / LM (Total Unit \$)		10000			10000	CECOS-125 miles one way
Disposal	20	T	\$110.00 / ton (Total Unit \$)		2200			2200	Offsite disposal of
Disposal- drums	250	EA	\$40.00 /drum (Total Unit \$)		10000			10000	debris, ie, railroad ties, wooden pallets,
Total					22200			22200	battery casing, cupolas, piping etc.
Subcontractor @ 10% of Sub. Cost					2220			0	
Burden @ 13% of Labor Cost								0	
Labor @ 15% of Labor Cost								0	
Material @ 5% of Material Cost								0	
Total Direct Costs (TDC)					24420			24420	
Indirects - 7% of Labor TDC								0	
Profit @ 10% of TDC								2442	
Total					24420			26862	
Working Level: C.D. .35								0	
Health & Safety Monitoring @ .10								2686	
Total Field Cost (TFC)								29548	
Contingency @ 20% of TFC								5910	
Engineering @ 5% of TFC								1477	
CAPITAL COST THIS PAGE								36935	

ORIGINAL
(red)

AR000838

MILL CREEK
Groundwater Treatment
System
(MILLIGS)

ITEM	QUANTITY	DIRECT UNIT PRICE				DIRECT UNIT COST				ITEM COST	CONVERTERS	
		MATERIALS	LABOR	EQUIPMENT	SUB.	MATERIALS	LABOR	EQUIPMENT				
1. Equipment												
a. Neutralization Tank	1	EA \$6500.00	\$600.00			6500	600			7100		
b. Neutralization Mixer	1	EA \$6000.00	\$600.00			6000	600			6600		
c. Clarifier	1	EA \$143100.00	\$37100.00			143100	37100			180200		
d. Lime Feed System	1	EA \$75000.00	(Total Unit \$)		75000	75000				150000		
e. Clarifier Underflow Pumps	2	EA \$4000.00	\$300.00			8000	600			8600		
f. Distribution Tank	1	EA \$9000.00	\$800.00			9000	800			9800		
g. ReInjection Pumps	2	EA \$3000.00	\$300.00			6000	600			6600		
h. Polymer Feed System	1	EA \$4500.00	\$400.00			4500	400			4900		
i. Carbon Filter	2	EA \$110000.00	\$5000.00			220000	10000			230000		
j. Air Stripper	1	EA \$100000.00	\$40000.00			100000	40000			140000		
k. Treat. Supply Pumps	2	EA \$5000.00	\$300.00			10000	600			10600		
l. Piping	1400	LF \$45.15	\$19.20			63210	26800			90090		
m. Treatment Building	1200	SF \$30.00	(Total Unit \$)	\$26.00	36000	44600	85855	5798		136253		Treatment Building Building & Foundations.
n. Foundations	223	CY \$200.00	\$385.00			44600	85855	5798		136253		
o. Electrical												
a. Motor Starter #1	14	EA \$800.00	\$200.00			11200	2800			14000		
b. Motor Starter #2	2	EA \$1300.00	\$300.00			2600	600			3200		
c. Disconnect Switch	4	EA \$800.00	\$200.00			3200	800			4000		
d. Transformer	1	EA \$1200.00	\$500.00			1200	500			1700		
e. Conduit, Cable, Control	16	EA \$455.00	\$680.00			7280	10880			18160		
f. Grounding/Hiring	2	LOT \$6000.00	\$6000.00			12000	12000			24000		
Total					111000	733390	231615	5798		1081803		
Subcontractor @ 10% of Sub. Cost					11100					11100		
Burden @ 13% of Labor Cost							30110			30110		
Labor @ 15% of Labor Cost							34742			34742		
Material @ 5% of Material Cost						36670				36670		
Total Direct Costs (IDC)					122100	770060	296467			1194425		
Indirects 75% of Labor IDC							222350			222350		
Profit @ 10% of IDC										119442		
Total					122100	770060	518616			1536216		
Working Level: D=.15										77823		
Health & Safety Monitoring @ .06										129123		
Total Field Cost (IFC)										1743163		
Contingency @ 20% of IFC										348633		
Engineering @ 5% of IFC										87168		
CAPITAL COST THIS PAGE										2176954		

ORIGINAL
(red)

AR000839

ORIGINAL

(red)

MILCREEK
Groundwater Wells
Installation
(MILCREEK)

ITEM	QUANTITY	DIRECT UNIT PRICE			SUB.	DIRECT UNIT COST			ITEM DIRECT COST	COMMENTS
		MATERIALS	LABOR	EQUIPMENT		MATERIALS	LABOR	EQUIPMENT		
Pumps	23	EA	\$1500.00 (Total Unit \$)		34500				34500	
Extraction Wells	240	LF	\$60.00 (Total Unit \$)		14400				14400	
Injection Wells	200	LF	\$40.00 (Total Unit \$)		8000				8000	
Piping	4500	LF	\$8.50 (Total Unit \$)		38250				38250	
Total					95150				95150	
Subcontractor @ 10% of Sub. Cost									9515	
Burden @ 1.3% of Labor Cost									0	
Labor @ 15% of Labor Cost									0	
Material @ 5% of Material Cost									0	
Total Direct Costs (TDC)					104665	0	0	0	104665	
Indirects - 7.5% of Labor TDC									0	
Profit @ 10% of TDC									10467	
Total					104665	0	0	0	115132	
Resting level: C, D .35									0	
Health & Safety Monitoring @ .00									11513	
Total Field Cost (TFC)									126645	
Contingency @ 20% of TFC									25329	
Engineering @ 5% of TFC									6332	
CAPITAL COST THIS PAGE									158306	

AR000840

MILLCREEK
 Dewatering Area
 Alternative 5.6.4.9,12
 (MILLDEWAT)

ITEM	QUANTITY	DIRECT UNIT PRICE			DIRECT UNIT COST			ITEM DIRECT COST	COMMENTS
		MATERIALS	LABOR	EQUIPMENT	MATERIALS	LABOR	EQUIPMENT		
Dewatering Pad									
Excavation	5100 CY	\$1.20	\$2.83		0	6120	14433	20553	
Sand	1680 CY	\$6.50	\$2.83		10920	2016	4754	17690	
30 Mil Membrane	45100 SF	\$0.30			13530	9020	0	22550	
Slag	1680 CY	\$1.50	\$2.83		2520	2016	4754	9290	
Construction Water Basin									
Excavation	1300 CY	\$1.20	\$2.83		0	1560	3679	5239	
Clay	400 CY	\$9.00	\$7.47		3600	1504	2988	8092	
30 Mil Membrane	5400 SF	\$0.30			1620	1080	0	2700	
Sand/Gravel	300 CY	\$6.50	\$2.83		1950	360	849	3159	
Silt Fences	450 LF	\$2.25	\$0.16		1013	72	0	1085	
Total					0	23748	31458	90358	
Subcontractor @ 10% of Sub. Cost					0			0	
Burden @ 13% of Labor Cost						3087		3087	
Labor @ 15% of Labor Cost						3562		3562	
Material @ 5% of Material Cost					1758			1758	
Total Direct Costs (TDC)					0	30397	31458	98765	
Indirects 75% of Labor TDC						22798		22798	
Profit @ 10% of TDC								9877	
Total					0	53196	31458	131440	
Working level: C.D.=.35								29629	
Health & Safety Monitoring @ .10								16107	
Total Field Cost (TFC)								177176	
Contingency @ 20% of TFC								35435	
Engineering @ 5% of TFC								8859	
CAPITAL COST THIS PAGE								221469	

ORIGINAL
(red)

HEIHEI
Computer Management System
Alternative 5, 6, 7, 8, 9 & 10, 11, 12
(01115052)

ITEM	QUANTITY	DIRECT UNIT PRICE			DIRECT UNIT COST			ITEM DIRECT COST	COMMENTS
		MATERIALS	LABOR	EQUIPMENT	MATERIALS	LABOR	EQUIPMENT		
Excavation	27900	CY	\$1.67	\$2.58	0	30243	590R2	97325	
Clay - 2 FT.	7900	CY	\$3.76	\$7.47	71100	29704	59013	159817	
10 FT Formwork	100000	SF	\$0.40	\$0.20	31800	21200	0	53600	
Sand/gravel - 1 FT.	3900	CY	\$1.20	\$2.83	39000	4600	11037	54717	
Stone - 1 FT.	3900	CY	\$1.20	\$2.83	39000	4600	11037	54717	3-8 in. diameter
Embedments	3120	CY	\$9.00	\$7.47	28000	11731	23306	63110	
Concrete Pipe - 15 in.	120	LF	\$6.70	\$0.48	744	374	58	1176	
Sheet Piling	200	SF	\$6.40	\$1.49	1792	361	417	2570	
Rein	4	EA	\$1000.00	\$500.00	4000	2000	0	6000	
Stone Pilecap	200	CY	\$7.50	\$4.87	2100	1364	1300	4844	
Sheet Piles	2300	LF	\$2.20	\$0.96	5060	5520	220R	12708	
Total					0	222676	119857	167539	510072
Subcontractor @ 10% of Sub. Cost					0			0	
Burden @ 10% of Labor Cost							15581	15581	
Factor @ 15% of Labor Cost							17979	17979	
Factor @ 5% of Material Cost						11134		11134	
Total Direct Costs (DCC)					0	233810	153417	167539	554766
Indirects - 7% of Labor DCC							115063	115063	
Profit @ 10% of DCC								55477	
Total					0	233810	268481	167539	725306
Booting Level: 0.15								65403	
Health & Safety Monitoring @ .08								63257	
Total Field Cost (TFC)								853965	
Contingency @ 20% of TFC								170793	
Escrow Inv @ 5% of TFC								42698	
CAPITAL COST THIS PAGE								1067456	

AR000842

ORIGINAL
(red)

MILLER
Stormwater Management System Dewatering
Alternative 5, 6, 7, 8 & 9, 12
(MILLER)

ITEM	QUANTITY	DIRECT UNIT PRICE			DIRECT UNIT COST			ITEM COST	COMMENTS
		MATERIALS	LABOR	EQUIPMENT	MATERIALS	LABOR	EQUIPMENT		
Dewatering Wells	35								35 wells @ 20' ea.
Boring	700	LF	\$40.00 (total unit \$)		28000			28000	Two stormwater ponds
Well Screen	140	LF	\$8.00 (total unit \$)		1120			1120	will be constructed
Install Well Screen	350	LF	\$5.00 (total unit \$)		1750			1750	at a time. Therefore,
Gravel Pack- 8.72 c/well	305	CF	\$4.00 (total unit \$)		1220			1220	some material will be
PVC Riser- 6 in.	140	LF	\$8.00 (total unit \$)		1120			1120	used twice.
Install PVC Riser	350	LF	\$4.00 (total unit \$)		1400			1400	
Pipe Manifold & Conductor	1000	LF	\$10.00 (total unit \$)		10000			10000	
Electric Cable	2000	LF	\$6.00 (total unit \$)		12000			12000	
Install & Pull Pumps	35	EA	\$700.00 (total unit \$)		24500			24500	
Pull Wells	35	EA	\$5.00 (total unit \$)		175			175	
Plug Wells	175	CF	\$30.00 (total unit \$)		5250			5250	
Push/Repair			\$5000.00 (total unit \$)		5000			5000	
Total					91535	0	0	91535	
Subcontractor @ 10% of Sub. Cost					9154			9154	
Burden @ 13% of Labor Cost					0			0	
Labor @ 15% of Labor Cost					0			0	
Material @ 5% of Material Cost					0			0	
Total Direct Costs (IDC)					100689	0	0	100689	
Indirects - 75% of Labor IDC					0			0	
Profit @ 10% of IDC					0			0	
Total					100689	0	0	110757	
Surfing Level: 0-.15								0	
Health & Safety Monitoring @ .10								11076	
Total Field Cost (IFC)								121833	
Contingency @ 20% of IFC								24367	
Engineering @ 10% of IFC								12183	
CAPITAL COST THIS PAGE								156303	

AR000843

MILLCREEK
Excavation-Alternatives 12
(Insite Disposal)
(MILLEX11)

ITEM	QUANTITY	DIRECT UNIT PRICE			SUB.	DIRECT UNIT COST			ITEM DIRECT COST	COMMENTS
		MATERIALS	LABOR	EQUIPMENT		MATERIALS	LABOR	EQUIPMENT		
Excavation - Dragline	12700	CY	\$1.67	\$2.58		21209	32766	53975	Southeast corner	
Excavation	8100	CY	\$1.67	\$3.44		13527	27864	41391	Erosion control bench	
Excavation	450	CY	\$2.30	\$3.26		1035	1467	2502	Sed. from drained pond	
Excavation	72500	CY	\$1.40	\$3.44		101500	249400	350900		
Excavation Dragline	9150	CY	\$4.19	\$5.05		38339	46208	84546	Swamp & Marshall's Run	
Backfill Excavation	60210	CY	\$1.20	\$2.83		72252	170394	332961		
Backfill Swamp	6200	CY	\$1.50	\$2.83		9300	17546	34286		
Silt Fences	4100	LF	\$2.25	\$0.16		9225	656	9881		
Rehandle Dewatered Excav.	19000	CY	\$0.96	\$2.26		18240	42940	61180		
Topsoil - 6 in.	28900	CY	\$5.50	\$2.83		158950	81787	275417		
Soil - 18 in.	86600	CY	\$1.50	\$2.83		129900	245078	478898		
Total					0	397690	915450	1725937		
Subcontractor @ 10% of Sub. Cost					0			0		
Burden @ 13% of Labor Cost						53664		53664		
Labor @ 15% of Labor Cost						61920		61920		
Material @ 5% of Material Cost						19885		19885		
Total Direct Costs (IDC)					0	417575	915450	1861405		
Indirects 75% of Labor IDC						396286		396286		
Profit @ 10% of IDC								186141		
Total					0	417575	915450	2443831		
Working level: C=.7								1288081		
Health & Safety Monitoring @ .06								223915		
Total Field Cost (TFC)								3955827		
Contingency @ 20% of TFC								791165		
Engineering @ 5% of TFC								197791		
CAPITAL COSTS THIS PAGE								4944784		

ORIGINAL
(red)

MILLCREEK
Soil/Membrane/Clay
Alternative 12
(MILLCREEK)

ITEM	QUANTITY	DIRECT UNIT PRICE			DIRECT UNIT COST			ITEM DIRECT COST	COMMENTS
		MATERIALS	LABOR	EQUIPMENT	SUB.	MATERIALS	LABOR		
Clear & Grub	43								
Grade	46300		\$1.40	\$1280.00		0	43430	55040	98470
Topsoil- 6 in.	5800	\$5.50	\$1.20	\$2.83		0	64820	57412	122232
Soil- 18 in.	17500	\$1.50	\$1.20	\$2.83		31900	6960	16414	55274
Filter Fabric	70200	\$1.00	\$0.20			26250	21000	49525	96775
Gravel- 12 in.	11700	\$10.00	\$1.20	\$2.83		70200	14040	84240	2. Common Borrow
50 Mil Membrane	315600	\$0.50	\$0.20		220920	117000	14040	33111	164151
Clay- 24 in.	23400	\$9.00	\$3.76	\$7.47		210600	87984	174798	220920
Perf. PVC Pipe	4500	\$0.65	\$1.32			2925	5940		473382
Chain Link Fence	8400	\$9.65		(Total Unit \$)	81060				8865
Revegetation	1870	\$24.60	\$5.60	\$4.45		46002	10472	8322	81060
Total					301980	504877	268686	394622	1470165
Subcontractor @ 10% of Sub. Cost					30198				30198
Rurden @ 13% of Labor Cost							34929		34929
Labor @ 15% of Labor Cost							40303		40303
Material @ 5% of Material Cost						25244			25244
Total Direct Costs (TDC)					332178	530121	343918	394622	1600838
Indirects 75% of Labor IDC							257939		257939
Profit @ 10% of IDC									160084
Total					332178	530121	601857	394622	2018861
Working Level: C,D= .35									348767
Health & Safety Monitoring @ .06									142050
Total Field Cost (IFC)									2509686
Contingency @ 20% of IFC									501937
Engineering @ 5% of IFC									125484
CAPITAL COST THIS PAGE									3137107

AR000845

PRESENT WORTH ANALYSIS

SITE: MILLCREEK
 ALTERNATIVE NO.: 12
 11289 (Best case without groundwater remediation)

COST COMPONENT	COST/YEAR COST OCCURS (\$000's)											
	0	1	2	3	4	5	6	7	8	9	10	11
1. CAPITAL COSTS	9526											
2. O & M COSTS	---	187										
3. ANNUAL COSTS	9526	187	187	187	187	187	187	187	187	187	187	187
4. ANNUAL DISCOUNT RATE=10%	1	0.909	0.826	0.751	0.683	0.621	0.564	0.513	0.467	0.424	0.386	0.35
PRESENT WORTH =	9526	170	154	140	128	116	105	96	87	79	72	65

O & M COSTS	12	13	14	15	16	17	18	19	20	21	22	23
ANNUAL DISCOUNT RATE=10%	187	187	187	187	187	187	187	187	187	187	187	187
PRESENT WORTH =	60	54	49	45	41	37	34	31	28	25	23	21

O & M COSTS	24	25	26	27	28	29	30					
ANNUAL DISCOUNT RATE=10%	187	187	187	187	187	187	187					
PRESENT WORTH =	19	17	16	14	13	12	11					

TOTAL PRESENT WORTH (000's)	11289											

ORIGINAL
(red)

PRESENT WORTH ANALYSIS

SITE: MILLCREEK
ALTERNATIVE NO.: 12
14361 (Best case with g.w. remediation)

COST COMPONENT	COST/YEAR COST OCCURS (\$000's)											
	0	1	2	3	4	5	6	7	8	9	10	11
1. CAPITAL COSTS	11863											
2. O & M COSTS	---	611	611	187	187	187	187	187	187	187	187	187
3. ANNUAL COSTS	11863	611	611	187	187	187	187	187	187	187	187	187
4. ANNUAL DISCOUNT RATE=10%	1	0.909	0.826	0.751	0.683	0.621	0.564	0.513	0.467	0.424	0.386	0.35
PRESENT WORTH =	11863	555	505	140	128	116	105	96	87	79	72	65

12	13	14	15	16	17	18	19	20	21	22	23	
187	187	187	187	187	187	187	187	187	187	187	187	187
0.319	0.29	0.263	0.239	0.218	0.198	0.18	0.164	0.149	0.135	0.123	0.112	0.112
PRESENT WORTH =	60	54	49	41	37	34	31	28	25	23	21	

24	25	26	27	28	29	30	TOTAL					
187	187	187	187	187	187	187	PRESENT					
0.101	0.092	0.084	0.076	0.069	0.063	0.057	WORTH					
PRESENT WORTH =	19	17	16	14	12	11	-----					
							14361					

AR000847

RAA12 - FUEL COST WITHOUT GW REMOVAL

SUMMARY OF SENSITIVITY ANALYSIS

COST in thousands

COST FACTOR	BASELINE COST	SENSITIVITY FACTOR EXAMINED RESULTS		
		LOW	HIGH	ORIGINAL
CAPITAL COSTS (\$):	9520	7157	12,023	(red)
PRESENT WORTH (\$):	11289	8920	13786	
ANNUAL COSTS (Year):	1	187	187	187
	2			
	3			
	4			
	5			
	6			
	7			
	8			
	9			
	10			
	11			
	12			
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	29			
	30	Y	Y	Y

AR000848

RTA 12. DSC cost with you remediation

SUMMARY OF SENSITIVITY ANALYSIS

(cost in thousands)

COST FACTOR	BASELINE COST	SENSITIVITY FACTOR EXAMINED RESULTS		
		LOW	HIGH	ORIGINAL
CAPITAL COSTS (\$):	11863	9027	15062	(red)
PRESENT WORTH (\$):	14361	11525	17500	
ANNUAL COSTS (Year '5)	1	611	611	611
	2	611	611	611
	3	187	187	187
	4			
	5			
	6			
	7			
	8			
	9			
	10			
	11			
	12			
	13			
	14			
	15			
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	17			
	18			
	19			
	20			
	21			
	22			
	23			
	24			
	25			

ORIGINAL
(red)

HILLCREEK
Excavation-Alternatives 12A
Onsite Disposal
(MILLEX11)

ITEM	QUANTITY	DIRECT UNIT PRICE			SUB.	DIRECT UNIT COST			ITEM DIRECT COST	COMMENTS
		MATERIALS	LABOR	EQUIPMENT		MATERIALS	LABOR	EQUIPMENT		
Excavation - Dragline	12700 CY	\$1.67		\$2.58		21209	32766	53975	Southeast corner	
Excavation	8100 CY	\$1.67		\$3.44		13527	27864	41391	Erosion control bench	
Excavation	450 CY	\$2.30		\$3.26		1035	1467	2502	Sed. from drained pond	
Excavation	177900 CY	\$1.40		\$3.44		249060	611976	861036		
Excavation Dragline	9150 CY	\$4.19		\$5.05		38339	46208	84546	Swamp & Marshalls Run	
Backfill Excavation	107500 CY	\$1.20		\$2.83		129000	304225	594475		
Backfill Swamp	6200 CY	\$1.50		\$2.83		9300	17546	34286		
Silt Fences	4100 LF	\$2.25		\$0.16		9225	656	9881		
Rehandle Dewatered Excav.	19000 CY	\$0.96		\$2.26		18240	42940	61180		
Topsoil - 6 in.	21400 CY	\$5.50		\$2.83		117700	60562	203942		
Soil - 18 in.	64100 CY	\$1.50		\$2.83		96150	181403	354473		
Total						0	1326957	2301687		
Subcontractor @ 10% of Sub. Cost						0		0		
Burden @ 13% of Labor Cost						75544		75544		
Labor @ 15% of Labor Cost						87166		87166		
Material @ 5% of Material Cost						19681		19681		
Total Direct Costs (TDC)						0	1326957	2484078		
Indirects 75% of Labor TDC						557861		557861		
Profit @ 10% of TDC								248408		
Total						0	1301676	3290347		
Working Level: C-.7								1840043		
Health & Safety Monitoring @ .06								307823		
Total Field Cost (TFC)								5438213		
Contingency @ 20% of TFC								1087643		
Engineering @ 5% of TFC								271911		
CAPITAL COSTS THIS PAGE								6797767		

AR000850

ORIGINAL

(red)

MILLCREEK
Soil/Membrane/Clay
Alternative 12A
(MILLCR11)

ITEM	QUANTITY	DIRECT UNIT PRICE			DIRECT UNIT COST			ITEM DIRECT COST	COMMENTS
		MATERIALS	LABOR	EQUIPMENT	SUB.	MATERIALS	LABOR		
Clear & Grub	43	AC	\$1010.00	\$1280.00	0	43430	55040	98470	
Grade	46300	CY	\$1.40	\$1.24	0	64820	57412	122232	
Topsoil- 6 in.	13400	CY	\$5.50	\$2.83	73700	16080	37922	127702	
Soil- 18 in.	46200	CY	\$1.50	\$2.83	69300	55440	130746	255486	2. Common Borrow
Filter Fabric	160700	SY	\$1.00	\$0.20	160700	32140	75844	192840	
Gravel- 12 in.	26800	CY	\$10.00	\$2.83	268000	32160	506380	376004	
50 M1 Membrane	723400	SF	\$0.50	\$0.20	506380	201536	400392	1084328	
Clay- 24 in.	53600	CY	\$9.00	\$3.76	81060	5785	11748	175333	
Perf. PVC Pipe	8900	LF	\$0.65	\$1.32	81060	10472	8322	81060	
Chain Link Fence	8400	LF	\$9.65	(Total Unit \$)				64796	
Revegetation	1870	MSF	\$24.60	\$4.45					
Total					587440	1105887	467826	765678	2926831
Subcontractor @ 10% of Sub. Cost					58744				58744
Burden @ 13% of Labor Cost							60817		60817
Labor @ 15% of Labor Cost							70174		70174
Material @ 5% of Material Cost						55294			55294
Total Direct Costs (TDC)					646184	1161181	598817	765678	3171860
Indirects 75% of Labor TDC							449113		449113
Profit @ 10% of TDC									317186
Total					646184	1161181	1047930	765678	3938159
Working Level: C.D- 35									634763
Health & Safety Monitoring @ .06									274375
Total Field Cost (TFC)									4847297
Contingency @ 20% of TFC									969459
Engineering @ 5% of TFC									242365
CAPITAL COST THIS PAGE									6059121

AR000851

ORIGINAL
(red)

MILLERIK
Monitoring Well
Installation
(MILLERIK)

ITEM	QUANTITY	DIRECT UNIT PRICE			DIRECT UNIT COST			ITEM DIRECT COST	COMMENTS
		MATERIALS	LABOR	EQUIPMENT	MATERIALS	LABOR	EQUIPMENT		
Monitoring Wells	180	LF	\$80.00	(Total Unit \$)	14400			14400	1. 4 New Wells
Total					14400			14400	
Subcontractor @ 10% of Sub. Cost					1440			1440	
Burden @ 13% of Labor Cost					0	0	0	0	
Labor @ 15% of Labor Cost					0	0	0	0	
Material @ 5% of Material Cost					0	0	0	0	
Total Direct Costs (DDC)					15840	0	0	15840	
Indirects 7.5% of Labor DDC					0	0	0	0	
Profit @ 10% of DDC					1584			1584	
Total					15040	0	0	17424	
Monitoring Level: C, P = .35								0	
Health & Safety Monitoring								1742	
Total Field Cost (DFC)								19166	
Contingency @ 20% of DFC								3833	
Engineering @ 5% of DFC								958	
CAPITAL COST THIS PAGE								23958	

AR000852

ORIGINAL
(red)

BUCHER
Surface Water Treatment
System
(HHSW)

ITEM	QUANTITY	DIRECT UNIT PRICE				DIRECT UNIT COST				ITEM DIRECT COST	COMMENTS
		MATERIALS	LABOR	EQUIPMENT	SUB.	MATERIALS	LABOR	EQUIPMENT			
1. Equipment											
a. Neutralization tank	1	EA \$500.00	\$100.00			500	100			600	
b. Neutralization Mixer	1	EA \$800.00	\$200.00			800	200			1000	
c. Treat. Supply Pumps	2	EA \$1400.00	\$200.00			2800	400			3200	1. b. 1.5 HP
d. Qualization tank	1	EA \$300.00	\$100.00			300	100			400	
e. Polymer Mix tank	1	EA \$300.00	\$100.00			300	100			400	
f. Piping	1000	LF \$12.00	\$5.90			12000	5900			17900	
g. Treatment Building	150	SF \$5.00	(Total Unit \$)		750	2200	4160			750	750 Treatment Building
4. Foundations	11	CY \$200.00	\$380.00	\$20.00			7000			6380	Building & Foundations.
5. Sedimentation Basin	1	EA	\$7000.00	\$200.00				200		7200	
6. Electrical											
a. Motor Starter #1	4	EA \$800.00	\$200.00			3200	800			4000	
b. Disconnect Switch	1	EA \$800.00	\$200.00			800	200			1000	
c. Conduit, Cable, Control	4	EA \$450.00	\$650.00			1800	2600			4400	
d. Grounding/Wiring	2	LOT \$500.00	\$500.00			1000	1000			2000	
Total					750	25700	22580	200		49230	
Subcontractor @ 10% of Sub. Cost					75					75	
Burden @ 13% of Labor Cost							2935			2935	
Labor @ 15% of Labor Cost							3387			3387	
Material @ 5% of Material Cost						1285				1285	
Total Direct Costs (DDC)					825	26985	28902			56912	
Indirects 75% of Labor 10							21677			21677	
Profit @ 10% of DDC							5691			5691	
Total					825	26985	50579			84280	
Monitoring Level: 0.15										7587	
Health & Safety Monitoring										9187	
at .10											
Total Field Cost (FFC)										101054	
Contingency @ 20% of FFC										20211	
Engineering @ 5% of FFC										5053	
CAPITAL COST THIS PAGE										126310	

AR000853

ORIGINAL
(red)

HILLBEEK
Surface Debris
Offsite Disposal
(HILLBEEKS)

ITEM	QUANTITY	DIRECT UNIT PRICE			DIRECT UNIT COST			ITEM DIRECT COST	COMMENTS
		MATERIALS	LABOR	EQUIPMENT	MATERIALS	LABOR	EQUIPMENT		
Transportation	2500	LN	\$4.00 / LM (Total Unit \$)		10000		10000	CLC05-125 miles one way	
Disposal	20	T	\$110.00 / ton (Total Unit \$)		2200		2200	Offsite disposal of	
Disposal - drums	250	EA	\$40.00 / drum (Total Unit \$)		10000		10000	debris, ie. railroad ties, wooden pallets, battery casing, cupolas, 2220 piping etc.	
Total					22200		22200		
Subcontractor @ 10% of Sub. Cost					2220		24420		
Overhead @ 13% of Labor Cost							0		
Labor @ 15% of Labor Cost							0		
Material @ 5% of Material Cost							0		
Total Direct Costs (IDC)					24420		24420		
Indirects 75% of Labor IDC							0		
Profit @ 10% of IDC							2442		
Total					24420		26862		
Working Level: C @ .35							0		
Health & Safety Monitoring @ .10							2686		
Total Field Cost (IFC)							29548		
Contingency @ 20% of IFC							5910		
Engineering @ 5% of IFC							1477		
CAPITAL COST THIS PAGE							36935		

AR000854

ORIGINAL
(red)

MILL CREEK
Groundwater Treatment
System
(MIGS)

ITEM	QUANTITY	DIRECT UNIT PRICE			DIRECT UNIT COST			ITEM DIRECT COST	CONTRACTS
		MATERIALS	LABOR	EQUIPMENT	MATERIALS	LABOR	EQUIPMENT		
1. Equipment									
a. Neutralization Tank	1	EA \$6500.00	\$600.00		6500	600		7100	
b. Neutralization Mixer	1	EA \$6000.00	\$600.00		6000	600		6600	I.B. 7.5 HP
c. Clarifier	1	EA \$143100.00	\$37100.00		143100	37100		180200	
d. Lime Feed System	1	EA \$75000.00	(Total Unit \$)		75000			75000	
e. Clarifier Underflow Pumps	2	EA \$4000.00	\$300.00		8000	600		8600	
f. Distribution Tank	1	EA \$9000.00	\$800.00		9000	800		9800	
g. ReInjection Pumps	2	EA \$3000.00	\$300.00		6000	600		6600	
h. Polymer Feed System	1	EA \$4500.00	\$400.00		4500	400		4900	
i. Carbon Filter	2	EA \$110000.00	\$5000.00		220000	10000		230000	
j. Air Stripper	1	EA \$100000.00	\$40000.00		100000	40000		140000	
k. Treat. Supply Pumps	2	EA \$5000.00	\$300.00		10000	600		10600	
2. Piping	1400	LF \$45.15	\$19.20		63210	26880		90090	
3. Treatment Building	1200	SF \$30.00	(Total Unit \$)		36000			36000	Treatment Building
4. Foundations	223	CY \$200.00	\$385.00	\$26.00	44600	85855	5798	136253	Building & Foundations..
5. Electrical									
a. Motor Starter #1	14	EA \$800.00	\$200.00		11200	2800		14000	
b. Motor Starter #2	2	EA \$1300.00	\$300.00		2600	600		3200	
c. Disconnect Switch	4	EA \$800.00	\$200.00		3200	800		4000	
d. Transformer	1	EA \$1200.00	\$500.00		1200	500		1700	
e. Conduit,Cable,Control	16	EA \$455.00	\$680.00		7280	10880		18160	
f. Grounding/Wiring	2	LOT \$6000.00	\$6000.00		12000	12000		24000	
Total					111000	231615	5798	1081803	
Subcontractor @ 10% of Sub. Cost					11100			11100	
Burden @ 13% of Labor Cost						30110		30110	
Labor @ 15% of Labor Cost						34742		34742	
Material @ 5% of Material Cost					36670			36670	
Total Direct Costs (TDC)					122100	770060	296467	1194425	
Indirects 75% of Labor TDC						222350		222350	
Profit @ 10% of TDC								119442	
Total					122100	770060	518618	1536218	
Working Level: D=.15								77823	
Health & Safety Monitoring @ .06								129123	
Total Field Cost (TFC)								1743163	
Contingency @ 20% of TFC								348633	
Engineering @ 5% of TFC								87158	
CAPITAL COST THIS PAGE								2178954	

AR000855

ORIGINAL
(red)

MILLERIK
Groundwater Wells
Installation
(BILGIBETT)

ITEM	QUANTITY	DIRECT UNIT PRICE			DIRECT UNIT COST			DIRECT COST	COMMENTS
		MATERIALS	LABOR	EQUIPMENT	MATERIALS	LABOR	EQUIPMENT		
Pumps	23	EA	\$1500.00 (Total Unit \$)				34500		
Extraction Wells	240	LF	\$60.00 (Total Unit \$)				14400		
Injection Wells	200	LF	\$40.00 (Total Unit \$)				8000		
Piping	4500	LF	\$8.50 (Total Unit \$)				38250		
Total							95150		
Subcontractor @ 10% of Sub. Cost							9515		
Burden @ 13% of Labor Cost							0		
Labor @ 15% of Labor Cost							0		
Material @ 5% of Material Cost							0		
Total Direct Costs (IDC)							104665		
Indirects 75% of Labor IDC							0		
Profit @ 10% of IDC							10467		
Total							115132		
Working Level: C, P .35							0		
Health & Safety Monitoring @ .08							11513		
Total Field Cost (IFC)							126645		
Contingency @ 20% of IFC							25329		
Engineering @ 5% of IFC							6332		
CAPITAL COST THIS PAGE							158306		

AR000856

ORIGINAL

(red)

MILLERK
 Dewatering Area
 Alternative 5, 6, 8 & 9, 11, 12
 (MILLEDHAT)

ITEM	QUANTITY	DIRECT UNIT PRICE			DIRECT UNIT COST			ITEM DIRECT COST	COMMENTS
		MATERIALS	LABOR	EQUIPMENT	MATERIALS	LABOR	EQUIPMENT		
Dewatering Pad									
Excavation	5100		\$1.20	\$2.83	0	6120	14433	20553	
Sand	1680	CY	\$6.50	\$2.83	10920	2016	4754	17690	
30 Mil Membrane	45100	SF	\$0.30	\$0.20	13530	9020	0	22560	
Slag	1680	CY	\$1.50	\$2.83	2520	2016	4754	9290	
Construction Water Basin									
Excavation	1300	CY	\$1.20	\$2.83	0	1560	3679	5239	
Clay	400	CY	\$3.76	\$7.47	3600	1504	2980	8092	
30 Mil Membrane	5400	SF	\$0.30	\$0.20	1620	1080	0	2700	
Sand/Gravel	300	CY	\$6.50	\$1.20	1950	360	849	3159	
Silt fences	450	LF	\$2.25	\$0.16	1013	72	0	1085	
Total					0	23748	31458	90358	
Subcontractor @ 10% of Sub. Cost					0			0	
Burden @ 13% of Labor Cost						3087		3087	
Labor @ 15% of Labor Cost						3562		3562	
Material @ 5% of Material Cost					1758			1758	
Total Direct Costs (TDC)					0	30397	31458	98765	
Indirects @ 75% of Labor TDC						22798		22798	
Profit @ 10% of TDC								9877	
Total					0	53196	31458	131440	
Working level: C.D. .35								29629	
Health & Safety Monitoring @ .10								16107	
Total Field Cost (TFC)								177176	
Contingency @ 20% of TFC								35435	
Engineering @ 5% of TFC								8859	
CAPITAL COST THIS PAGE								221469	

AR000857

ORIGINAL
(red)

HILLCREEK
Stormwater Management System
Alternative 5, 6, 7, 8, 9 & 10, 11, 12
(HILCSMS?)

ITEM	QUANTITY	DIRECT UNIT PRICE			SUB.	DIRECT UNIT COST			DIRECT COST	COMMENTS
		MATERIALS	LABOR	EQUIPMENT		MATERIALS	LABOR	EQUIPMENT		
Excavation	22900		\$1.67	\$2.58		0	38243	59082	97325	
Clay- 2 ft.	7900		\$3.76	\$7.47		71100	29704	59013	159817	
30 Mil Membrane	106000		\$0.30	\$0.20		31800	21200	0	53000	
Sand/Gravel- 1 ft.	3900		\$1.20	\$2.83		39000	4680	11037	54717	
Stone- 1 ft.	3900		\$1.20	\$2.83		39000	4680	11037	54717	3-8 in. diameter
Embankments	3120		\$3.76	\$7.47		28080	11731	23306	63118	
Concrete Pipe- 15 in.	120		\$3.12	\$0.48		744	374	58	1176	
Sheet Piling	200		\$6.40	\$1.29		1792	361	417	2570	
Weir	4		\$500.00			4000	2000	0	6000	
Stone Riprap	280		\$7.50	\$4.87		2100	1364	1360	4844	
Silt Fences	2300		\$2.20	\$0.96		5060	5520	2208	12788	
Total						0	119857	167539	510072	
Subcontractor @ 10% of Sub. Cost						0			0	
Burden @ 13% of Labor Cost							15581		15581	
Labor @ 15% of Labor Cost							17979		17979	
Material @ 5% of Material Cost						11134			11134	
Total Direct Costs (IDC)						0	153417	167539	554766	
Indirects 7% of Labor IDC							115063		115063	
Profit @ 10% of IDC									55477	
Total						0	268481	167539	725306	
Marketing Level: 0-.15									65403	
Health & Safety Monitoring @ .08									63257	
Total Field Cost (IFC)									853965	
Contingency @ 20% of IFC									170793	
Engineering @ 5% of IFC									42698	
CAPITAL COST THIS PAGE									1067456	

AR000858

ORIGINAL
 MILLIKEN
 Water Management System Dewatering
 Alternative 5,6,7,8 & 9, 11, 12

ITEM	QUANTITY	DIRECT UNIT PRICE			DIRECT UNIT COST			ITEM DIRECT COST	COMMENTS
		MATERIALS	LABOR	EQUIPMENT	MATERIALS	LABOR	EQUIPMENT		
35									
Roofing Wells	700	LF	\$40.00	(total unit \$)	28000	0	0	28000	35 wells @ 20' ea. Two stormwater ponds will be constructed at a time. Therefore, some material will be used twice.
Roofing Screen	140	LF	\$8.00	(total unit \$)	1120	0	0	1120	
Install Well Screen	350	LF	\$5.00	(total unit \$)	1750	0	0	1750	
Well Pack - 8.72 cf/well	305	CF	\$4.00	(total unit \$)	1220	0	0	1220	
Well Riser - 6 in.	140	LF	\$8.00	(total unit \$)	1120	0	0	1120	
Install PVC Riser	350	LF	\$4.00	(total unit \$)	1400	0	0	1400	
Pipe Handled & Conductor	1000	LF	\$10.00	(total unit \$)	10000	0	0	10000	
Electric Cable	2000	LF	\$6.00	(total unit \$)	12000	0	0	12000	
Install & Pull Pumps	35	EA	\$700.00	(total unit \$)	24500	0	0	24500	
Pull Wells	35	EA	\$5.00	(total unit \$)	175	0	0	175	
Pump Wells	175	EA	\$30.00	(total unit \$)	5250	0	0	5250	
Sub/Demob	175	CF	\$5000.00	(total unit \$)	5000	0	0	5000	

total
 Subcontractor @ 10% of Sub. Cost
 Burden @ 13% of Labor Cost
 Labor @ 15% of Labor Cost
 Material @ 5% of Material Cost

total
 Indirects 75% of Labor IDC
 Profit @ 10% of IDC

total
 Bidding Level: 0-.15
 Health & Safety Monitoring @ .10

total
 Total Field Cost (IFC)
 Contingency @ 20% of IFC
 Engineering @ 10% of IFC

CAPITAL COST THIS PAGE

91535	0	0	0	0	91535
9154	0	0	0	0	9154
100689	0	0	0	0	100689
100689	0	0	0	0	100689
110757	0	0	0	0	110757
121833	0	0	0	0	121833
24367	0	0	0	0	24367
12183	0	0	0	0	12183
158383	0	0	0	0	158383

AR000859

ORIGINAL

Site: MILLCREEK
ALTERNATIVE NO.: 10,
15987

PRESENT WORTH ANALYSIS

(worst case without gov. remediation)

COST COMPONENT	0	1	2	3	4	5	6	7	8	9	10	11
1. CAPITAL COSTS	14224											
2. O & M COSTS	---	187	187	187	187	187	187	187	187	187	187	187
3. ANNUAL COSTS	14224	187	187	187	187	187	187	187	187	187	187	187
4. ANNUAL DISCOUNT RATE=10%	1	0.909	0.826	0.751	0.683	0.621	0.564	0.513	0.467	0.424	0.386	0.35
PRESENT WORTH =	14224	170	154	140	128	116	105	96	87	79	72	65

	12	13	14	15	16	17	18	19	20	21	22	23
O & M COSTS	187	187	187	187	187	187	187	187	187	187	187	187
ANNUAL DISCOUNT RATE=10%	0.319	0.29	0.263	0.239	0.218	0.198	0.18	0.164	0.149	0.135	0.123	0.112
PRESENT WORTH =	60	54	49	45	41	37	34	31	28	25	23	21

	24	25	26	27	28	29	30	TOTAL PRESENT WORTH (000's)
O & M COSTS	187	187	187	187	187	187	187	
ANNUAL DISCOUNT RATE=10%	0.101	0.092	0.084	0.076	0.069	0.063	0.057	
PRESENT WORTH =	19	17	16	14	13	12	11	15987

AR000860

ORIGINAL

(d) SITE: MILLCREEK
 ALTERNATIVE NO: 12
 \$9060 (worst case with groundwater)

PRESENT WORTH ANALYSIS

COST COMPONENT	COST/YEAR COST OCCURS (\$000's)											
	0	1	2	3	4	5	6	7	8	9	10	11
1. CAPITAL COSTS	16562											
2. O & M COSTS	---	611	611	611	611	611	611	611	611	611	611	611
3. ANNUAL COSTS	16562	611	611	611	611	611	611	611	611	611	611	611
4. ANNUAL DISCOUNT RATE=10%	1	0.909	0.826	0.751	0.683	0.621	0.564	0.513	0.467	0.424	0.386	0.35
PRESENT WORTH =	16562	555	505	460	428	396	365	336	307	279	252	226

0 & M COSTS	187	187	187	187	187	187	187	187	187	187	187	187
ANNUAL DISCOUNT RATE=10%	0.319	0.29	0.263	0.239	0.218	0.198	0.18	0.164	0.149	0.135	0.123	0.112
PRESENT WORTH =	60	54	49	45	41	37	34	31	28	25	23	21

COST COMPONENT	COST/YEAR COST OCCURS (\$000's)											
	0	1	2	3	4	5	6	7	8	9	10	11
0 & M COSTS	187	187	187	187	187	187	187	187	187	187	187	187
ANNUAL DISCOUNT RATE=10%	0.101	0.092	0.084	0.076	0.069	0.063	0.057	0.052	0.047	0.042	0.038	0.034
PRESENT WORTH =	19	17	16	14	13	12	11	10	9	8	7	6
TOTAL PRESENT WORTH (\$000's)	19060											

AR000861

SUMMARY OF SENSITIVITY ANALYSIS

(Cost in \$/yr)

COST FACTOR	BASELINE COST	SENSITIVITY FACTOR EXAMINED RESULTS			
		LOW	HIGH		
CAPITAL COSTS (\$):	14224	10731	17847		
PRESENT WORTH (\$):	15987	12494	19630		
ANNUAL COSTS (\$/year)	1	187	187	187	
	2				
	3				
	4				
	5				
	6				
	7				
	8				
	9				
	10				
	11				
	12				
	13				
	14				
	15				
	16				
	17				
	18				
	19				
	20				
(red)					

ORIGINAL

AR000862

SUMMARY OF SENSITIVITY ANALYSIS

(Cost in 000's)

COST FACTOR	BASELINE COST	SENSITIVITY FACTOR EXAMINED RESULTS				
		LOW	HIGH			
CAPITAL COSTS (\$):	16,562	12,601	20,885			
PRESENT WORTH (\$):	19,660	15,699	23,383			
ANNUAL COSTS (Year's)	1	611	611	611		
	2	611	611	611		
	3	187	187	187		
	4					
	5					
	6					
	7					
	8					
	9					
	10					
	11					
	12					
	13					
	14					
	15					
	16					
	17					
	18					
	19					
	20					
	21					
	22					
	23					
24						
25						
26						
27						
28						
29						
30						

(red)

ORIGINAL

OPERATION AND MAINTENANCE COSTS

ORIGINAL
(red)

AR000864

MILLCREEK
Annual Operating Costs
All Alternatives

STORMWATER MANAGEMENT
SYSTEMS

COST COMPONENT	* ESTIMATE (\$)	* BASIS OF ESTIMATE	* FREQUENCY	* YEAR

0 & M COSTS	*	*	*	*
1. Operating Labor	*	*	*	1-30
a.	*	*	*	*
b.	*	*	*	*
c.	*	*	*	*

2. Maintenance, Mat'l's and labor	*	* CLEAN BASINS	*	*
a. Labor	\$2880.00	* 2 MEN @ 30/HR	*	*
		* 24 HR. EA., 2X1YR	Annual	1-30
		* (2)(30)(24)(2)	*	*
b.	*	*	*	*

3. Auxiliary Materials and Labor	*	* Assume replacement	*	*
a. Equipment	\$2000.00	* of 1% of topsoil	*	*
		* \$2000	Annual	1-30
b.	*	*	*	*
c.	*	*	*	*

4. Purchased Services	*	*	*	*
a. Equipment	\$1000.00	*	Annual	1-30
b.	*	*	*	*
c.	*	*	*	*

5. Disposal	*	*	*	*
a.	\$3500.00	* Dispose of sediments	*	*
b.	*	*	*	*
	*	*	*	*

6. Administration	\$1000.00	*	Annual	1-30
	*	*	*	*

7. Insurances, Taxes Licenses	*	*	*	*
a.	*	*	*	*
b.	*	*	*	*
c.	*	*	*	*

8. Maintenance and Contingency Costs	*	*	Annual	1-30
	*	*	*	*

9. Other	\$1000.00	*	Annual	1-30

ANNUALIZED CAPITAL COST	\$11380.00	*	Annual	1-30
	*	*	*	*

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ORIGINAL

AR000865

MILLCREEK
 Annual Operating Costs
 All Alternatives

MONITORING & ANALYSIS

COST COMPONENT	* ESTIMATE (\$)	* BASIS OF ESTIMATE	* FREQUENCY	* YEAR

0 & M COSTS	*	* QUARTERLY INSPECTION	*	*
1. Operating Labor	* \$5760.00	* 2 Men @ \$30/hr	* Annual	* 1-30
a. Sampling	*	* 24 hrs. ea. , 4x1yr	*	*
b.	*	* (2)(30)(24)(4)	*	*

2. Maintenance, Matl's and labor	*	*	*	*
a. Equipment	* \$1000.00	*	* Annual	* 1-30
b.	*	*	*	*

3. Auxiliary Materials and Labor	*	*	*	*
a.	*	*	*	*
b.	*	*	*	*

4. Purchased Services	*	* 35 Monitoring Wells	*	*
a. Lab Analysis	* \$140000.00	* Quarter \$1000/sample	*	*
		* 35(1000)(4)	* Annual	* 1-30
	* \$12000.00	* 3 Surface Water	*	*
b.	*	* Quarter \$1000/sample	*	*
		* 3 (1000)(4)	*	*

5. Disposal	*	*	*	*
a.	*	*	*	*
b.	*	*	*	*

6. Administration	*	*	*	*

7. Insurances, Taxes Licenses	*	*	*	*
a.	*	*	*	*
b.	*	*	*	*
c.	*	*	*	*

8. Maintenance and Contingency Costs	*	*	*	*

9. Other	*	*	*	*

ANNUALIZED CAPITAL COST	* \$158760.00	*	* Annual	* 1-30

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ORIGINAL

AR000866

MILLCREEK
Annual Operating Costs
Alternatives 3&4

PARTIAL CAPPING OPTIONS

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*****
COST COMPONENT * ESTIMATE ($) * BASIS OF ESTIMATE * FREQUENCY * YEAR
*****
0 & M COSTS * * * *
1. Operating Labor * * * * 1-30
  a. * * * *
  b. * * * *
  c. * * * *
*****
2. Maintenance, Matl's * * * *
   and labor * * * *
  a. Labor * $5760.00 * (2)(30)(24)(4) * Annual * 1-30
     * * * *
  b. Material * $1000.00 * Fencing & Reveg. * *
*****
3. Auxiliary Materials * * * *
   and Labor * * * *
  a. Materials * $1400.00 * $1400 * Annual * 1-30
  b. * * * *
  c. * * * *
*****
4. Purchased Services * * * *
  a. Equipment * $1000.00 * * Annual * 1-30
  b. * * * *
  c. * * * *
*****
5. Disposal * * * *
  a. * * * *
  b. * * * *
     * * * *
*****
6. Administration * $1000.00 * * Annual * 1-30
     * * * *
*****
7. Insurances, Taxes * * * *
   Licenses * * * *
  a. * * * *
  b. * * * *
  c. * * * *
*****
8. Maintenance and * $1000.00 * * Annual * 1-30
   Contingency Costs * * * *
*****
9. Other * * * *
*****
ANNUALIZED CAPITAL * * * *
COST * $11160.00 * * Annual * 1-30
*****

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(per)

ORIGINAL

AR000867

MILLCREEK
 Annual Operating Costs
 Alternatives 5,6,7,8,9 & 10

FULL CAPPING OPTIONS

COST COMPONENT	* ESTIMATE (\$)	* BASIS OF ESTIMATE	* FREQUENCY	* YEAR

0 & M COSTS	*	*	*	*
1. Operating Labor	*	*	*	* 1-30
a.	*	*	*	*
b.	*	*	*	*
c.	*	*	*	*

2. Maintenance, Matl's and labor	*	* 2 men @ \$30/hr	*	*
a. Labor	* \$9600.00	* 40 hrs ea. @ 4x1yr * (2)(30)(40)(4)	* Annual	* 1-30
b. Material	* \$1000.00	* Fencing & Reveg.	*	*

3. Auxiliary Materials and Labor	*	* Assume replacement	*	*
a. Materials	* \$3250.00	* of 1% of topsoil * \$3250	* Annual	* 1-30
b.	*	*	*	*
c.	*	*	*	*

4. Purchased Services	*	*	*	*
a. Equipment	* \$1000.00	*	* Annual	* 1-30
b.	*	*	*	*
c.	*	*	*	*

5. Disposal	*	*	*	*
a.	*	*	*	*
b.	*	*	*	*

6. Administration	* \$1000.00	*	* Annual	* 1-30

7. Insurances, Taxes Licenses	*	*	*	*
a.	*	*	*	*
b.	*	*	*	*
c.	*	*	*	*

8. Maintenance and Contingency Costs	* \$1000.00	*	* Annual	* 1-30

9. Other	*	*	*	*

ANNUALIZED CAPITAL COST	* \$16850.00	*	* Annual	* 1-30

(red)

ORIGINAL

AR000868

MILLCREEK
Annual Operating Costs

GROUNDWATER TREATMENT
SYSTEM

COST COMPONENT	* ESTIMATE (\$)	* BASIS OF ESTIMATE	* FREQUENCY	* YEAR

0 & M COSTS	*	* OPERATOR	*	*
1. Operating Labor	*	* 24 hr/7 day wk	* Annual	* 1-2
a. Labor	* \$300000.00	*	*	*
b.	*	*	*	*
c.	*	*	*	*

2. Maintenance, Matl's and labor	*	*	*	*
a. Electric	* \$22100.00	* (33.6 Kw)x24x365x.075	* Annual	* 1-2
b. Materials	* \$52200.00	*	*	*

3. Auxiliary Materials and Labor	*	*	*	*
a. Materials	* \$19200.00	* Polymer	* Annual	* 1-2
b.	* \$6200.00	* Lime	*	*
c.	* \$21900.00	* Carbon	*	*

4. Purchased Services	*	*	*	*
a.	*	*	*	*
b.	*	*	*	*
c.	*	*	*	*

5. Disposal	*	*	*	*
a.	*	*	*	*
b.	*	*	*	*

6. Administration	* \$1000.00	*	* Annual	* 1-2

7. Insurances, Taxes Licenses	*	*	*	*
a.	*	*	*	*
b.	*	*	*	*
c.	*	*	*	*

8. Maintenance and Contingency Costs	* \$1000.00	*	* Annual	* 1-2

9. Other	*	*	*	*

ANNUALIZED CAPITAL COST	* \$423600.00	*	* Annual	* 1-2

(per)

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MILLCREEK
Annual Operating Costs

LEACHATE COLLECTION
SYSTEM

COST COMPONENT	* ESTIMATE (\$)	* BASIS OF ESTIMATE	* FREQUENCY	* YEAR

0 & M COSTS	*	* QUARTERLY INSPECTION	*	*
1. Operating Labor	* \$1920.00	* 2 Men @ \$30/hr	* Annual	* 1-30
a. Labor	*	* 8 hrs. ea. , 4xlyr	*	*
b.	*	* (2)(30)(8)(4)	*	*
c.	*	*	*	*

2. Maintenance, Matl's and labor	*	* 2 men @ \$30/hr	*	*
a. Labor	* \$1920.00	* 8 hrs. ea.; 4xlyr	* Annual	* 1-30
b. Material	*	* (2)(30)(8)(4)	*	*
	*	* 0.5% of M+L Costs	*	*

3. Auxiliary Materials and Labor	*	*	*	*
a. Equip.	* \$1000.00	* Experience	* Annual	* 1-30
b.	*	*	*	*
c.	*	*	*	*

4. Purchased Services	*	*	*	*
a.	*	*	*	*
b.	*	*	*	*
c.	*	*	*	*

5. Disposal	*	*	*	*
a.	*	*	*	*
b.	*	*	*	*
c.	*	*	*	*

6. Administration	* \$1000.00	*	* Annual	* 1-30
	*	*	*	*

7. Insurances, Taxes Licenses	*	*	*	*
a.	*	*	*	*
b.	*	*	*	*
c.	*	*	*	*

8. Maintenance and Contigency Costs	* \$1000.00	*	* Annual	* 1-30
	*	*	*	*

9. Other	*	*	*	*

ANNUALIZED CAPITAL COST	* \$6840.00	*	*	*

(per)

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MILLCREEK
Annual Operating Costs

SURFACE WATER TREATMENT
SYSTEM

COST COMPONENT	* ESTIMATE (\$)	* BASIS OF ESTIMATE	* FREQUENCY	* YEAR

0 & M COSTS	*	* OPERATOR	*	*
1. Operating Labor	*	* 24 hr/day; 60 days	* Annual	* 0
a. Labor	* \$25000.00	*	*	*
b.	*	*	*	*
c.	*	*	*	*

2. Maintenance, Matl's and labor	*	*	*	*
a. Electric	* \$140.00	* (1.3 Kw)x24x60x.075	* Annual	* 0
b. Materials	* \$300.00	*	*	*

3. Auxiliary Materials and Labor	*	*	*	*
a. Materials	* \$130.00	* Polymer	* Annual	* 0
b.	*	*	*	*
c.	* \$200.00	* Caustic Soda	*	*

4. Purchased Services	*	*	*	*
a. POTW	* \$3000.00	* Cost to discharge	*	*
b.	*	* into POTW.	*	*
c.	*	*	*	*

5. Disposal	*	*	*	*
a.	*	*	*	*
b.	*	*	*	*
c.	*	*	*	*

6. Administration	* \$1000.00	*	* Annual	* 0
c.	*	*	*	*

7. Insurances, Taxes Licenses	*	*	*	*
a.	*	*	*	*
b.	*	*	*	*
c.	*	*	*	*

8. Maintenance and Contingency Costs	* \$1000.00	*	* Annual	* 0
c.	*	*	*	*

9. Other	*	*	*	*

ANNUALIZED CAPITAL COST	* \$30770.00	*	* Annual	* 0

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APPENDIX N

PRELIMINARY EXPOSURE ASSESSMENT SUPPORT

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PRELIMINARY EXPOSURE ASSESSMENT SUPPORT

The action levels or criteria that were developed as described in Section 12.8 were applied to the site data to arrive at a volume of contaminated soil/fill that would be excavated, isolated, and capped on site to remediate the site. Because of the lack of analytical data available on the western portion of the site, a range of volumes to be excavated was developed to present a best-case/worst-case scenario for Alternative 11.

To provide a data base to carry out the volume calculations, the following assumptions were made:

- The sample data identify contamination only at the sample points (best-case).
- The sample data are representative of a larger area of the site (worst-case).

Using these assumptions, the low and high volumes of soil/fill material to be excavated were calculated along with the associated costs. The actual volumes and costs should fall within this range. Table N-1 presents the volume calculations for the best- and worst-case scenarios. The corresponding costs can be found in Section 14.0 and Appendix M.

Figure 12-8 represents the best-case scenario. The isolated incidences of contamination (contamination found at specific sample locations) will be excavated and consolidated on site prior to capping with a RCRA-approved cap.

The worst-case scenario involves excavating the entire western portion of the site. The material will be disposed of on site and covered with a RCRA-approved cap. As identified in Section 12.0, there is insufficient information concerning the extent of contamination in the western portion of the site. Further sampling and

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analysis may be required to give a more accurate estimate of the volume of material to actually be excavated.

Construction activities for each of these scenarios will be similar, except for the volume to be excavated and the area to be capped.

N-2

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DATE 2/25/87

CLIENT MILLIGREAVE SITE FILE NO. 5700 BY ...

SUBJECT EXPANSION / ... Checked By ...

TABLE N-1

Area - HP digitizer

D. AVE DEPTH TO WATER TABLE OR LIMIT OF CONTAMINATION

DESCRIPTION	A (FT ²)	x	\bar{D} (FT)	V (FT ³)	\approx	V (YD ³)
✓ MW-18	31,800		7	222,600		8240
✓ SO-013	24,600		5	123,000		4560
✓ SO-010	23,300		2.5	58,250		2160
DIKE OF FINELY TEXTURED MAT'L	7800		5.0	39,000		1440
✓ MW17, SO-012, TP	57,700		7'-0	403,900		14,960
✓ MW16, SO-015	74,000		6'-0	444,000		16,440
✓ SO-018, -005	40,300		6'-0	241,800		8960
SO-007	14,200		5'-0	71,000		2630
MW14, SO-001, 001, -020, 016, 019	73,900		3'-0	221,700		8210
✓ SO-024, -025	33,000		4'-0	132,000		4890
						72490
SOUTHEAST CORNER (FROM PREVIOUS CALCS.) -						12660
✓ SEDIMENTS "						9600
EROSION CONTROL BENCH "						8080
						102830 cy

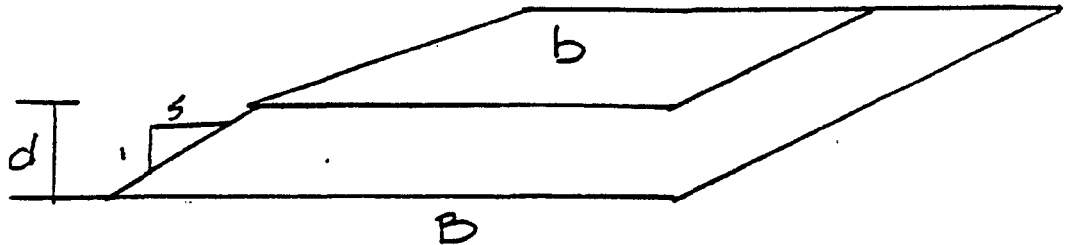
BACKFILL REQ'D (V) - TO APPROX. ORIGINAL CONTOURS - 60210 C

CLIENT _____ FILE NO. _____ BY _____

SUBJECT _____ Checked By _____

TABLE N-1

INSIDE DIMENSIONS OF CAP MATERIAL REQ'D TO COVER EXCAVATED MAT'L (102,930 CY)



$d = 12'-0$

$b = (440)(440) = 193600 \text{ SF}$

$B = (440 + 120)(440 + 120) = 313600 \text{ SF}$

$$V = \frac{d}{3} (B + b + \sqrt{Bb}) = \frac{12}{3} (193600 + 313600 + \sqrt{193600(313600)})$$

$$= 3014400 = 111640 \text{ CY}$$

SURFACE AREA = $(440)(440) + 4(61)(500) = 315600 \text{ SF}$

CAP QUANTITIES

2'-0 CLAY	$= 2(315600) =$	$\approx 23400 \text{ CY}$
50 MIL MEMBRANE	315600 SF	315600 SF
FILTER FABRIC		35100 SY
1'-0 GRAVEL	315600	11700 CY
FILTER FABRIC	$315600 / 9$	35100 SY
1'-6" SOIL	$1.5 (315600)$	17500 CY
0'-6" TOPSOIL	$.5 (315600)$	5800 CY
PIPE		4500 LF

SITE COVER

Soil	$1.5 (1559500)$	86600 CY
Topsoil	$.5 (1559500)$	28900 CY

TABLE N-1
VOLUME CALCULATIONS

DESCRIPTION	A (SF)	D (FT)	V (CF)	≈	V (CY)
WEST SIDE OF SITE	76,000	6	456,000		168,900
SO-018-005	4,300	6'-0	24,180		<u>8,960</u>

177,860 CY

SOUTHEAST
SEDIMENTS
EROSION CONTROL BENCH

12,660
9,600
8,080
20,820 CY

BACKFILL REQ'D (76,000) 3.5' = 98,500 + 8,960 = 107,460 CY

VOLUME OF CAP MAT'L (43 = SITE AREA)

d = 12
b = (1080) 480 = 518,400
B = (1200)(600) = 720,000

$V = \frac{12}{3} (518,400 + 720,000 + \sqrt{518,400(720,000)}) = 270,000 \text{ CY}$

SURFACE A = 1080(480) + 6(2)(540) + 6(2)(1140) = 723,360 SF

2'-0 CLAY ≈ 53,600 CY
MEMBRANE ≈ 723,400 SF
FILTER FAB ≈ 160,700 SF
GRAVEL ≈ 26,800 CY
1'-6" SOIL 40,200 CY
SOIL 13,400 CY
PIPE 8,900 LF

SITE COVER-

SOIL 64,100 CY
TOPSOIL 21,400 CY

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CLIENT USEPA Region III FILE NO. 778

 BY T.M.

 SUBJECT Preliminary Exposure Assessment

 Checked By CDC
Criteria Calculations

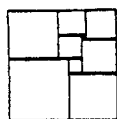
<u>Compound</u>	<u>Health Effects Criteria</u>	<u>K_{oc}</u>
PCB	$8.06 \times 10^3 \mu\text{g/l}$	33,884
Bis-(2-ethylhexyl)phthalate	$2.10 \times 10^4 \mu\text{g/l}$	3715.35
Di-N-butyl phthalate	$4.4 \times 10^4 \mu\text{g/l}$	1047.13
Benzo (a) Pyrene	$3.03 \times 10^{-3} \mu\text{g/l}$	524807.46

• TOC : Assume 1.5% taken as the average of 5 site soils

$$K_{oc}^* = \frac{\mu\text{g adsorbed contaminant/g soil organic carbon (SOC)}}{\mu\text{g contaminant/ml solution}}$$

$$- \mu\text{g contaminant/ml sol.} \times K_{oc} = \mu\text{g adsorbed contam. /g SOC}$$

* Lyman et al, Chemical Property Estimation Methods, 1990



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DATE 08 Aug 85

CLIENT USEPA Region III FILE NO. 8-778
(red)

BY DMS

SUBJECT Soils e m.c.

Checked By CDC

$$PCB\ 1254 \cdot \frac{8.06 \times 10^{-3} \mu g/l}{1000\ ml/l} \times 33,884 = 0.273 \mu g/g\ SOC$$

$$\cdot 0.273 \mu g/g\ SOC \times 0.015\ g\ SOC/g = 0.0041 \mu g/g$$

$$\cdot 0.0041 \mu g/g \times 1000\ g/kg = 4.1 \mu g/kg$$

$$BEHP \cdot \frac{2.1 \times 10^4 \mu g/l}{1000\ ml/l} \times 3715.4 = 7.8 \times 10^4 \mu g/g\ SOC$$

$$\cdot 7.8 \times 10^4 \mu g/g\ SOC \times 0.015\ g\ SOC/g = 1.17 \times 10^3 \mu g/g$$

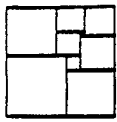
$$\cdot 1.17 \times 10^3 \mu g/g \times 1000\ g/kg = 1.17 \mu g/kg$$

$$DNBP \cdot \frac{4.4 \times 10^4 \mu g/l}{1000\ ml/l} \times 1047.1 = 4.61 \mu g/g\ SOC$$

$$\cdot 4.61 \times 10^4 \mu g/g\ SOC \times 0.015\ g\ SOC/g = 6.91 \times 10^2 \mu g/g$$

$$\cdot 6.91 \times 10^2 \mu g/g \times 1000\ g/kg = 6.91 \times 10^5 \mu g/kg$$

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DATE 08 Aug 85

CLIENT ISS. PA Reg III FILE NO. 8-778
(red)

BY DMS

SUBJECT Soils - m.c.

Checked By JDC

$$PNA(BAP) \cdot \frac{3.03 \times 10^{-3} \mu g/l}{1000 \mu g/ml} \times 524807.46 = 1.59 \mu g/g_{SOC}$$

$$\cdot 1.59 \mu g/g_{SOC} \times 0.015 g_{SOC}/g = 0.024 \mu g/g$$

$$\cdot 0.024 \mu g/g \times 1000 g/kg = 24 \mu g/kg$$

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