



TETRA TECH

November 8, 2010

Roy Crossland
START Project Officer
U.S. Environmental Protection Agency, Region 7
901 North 5th Street
Kansas City, Kansas 66101

**Subject: Analysis of Brownfields Cleanup Alternatives
Ehler's Property
1420 West College Street
Springfield, Greene County, Missouri
U.S. EPA Region 7 START 3, Contract No. EP-S7-06-01, Task Order No. 0002.055
Task Monitor: Paul Roemerman, Site Assessment Manager**

Dear Mr. Crossland:

Tetra Tech EM Inc. is submitting the attached Analysis of Brownfields Cleanup Alternatives for the Ehler's property in Springfield, Missouri. If you have any questions or comments, please contact the project manager at (816) 412-1788.

Sincerely,

David Zimmermann
START Project Manager

Ted Faile, PG, CHMM
START Program Manager

X9004.06.0002.055

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ANALYSIS OF BROWNFIELDS CLEANUP ALTERNATVES REPORT

**EHLER'S PROPERTY
1420 WEST COLLEGE STREET
SPRINGFIELD, GREENE COUNTY, MISSOURI**

Superfund Technical Assessment and Response Team (START) 3

Contract No. EP-S7-06-01, Task Order No. 0002.055

Prepared For:

U.S. Environmental Protection Agency
Region 7
901 North 5th Street
Kansas City, Kansas 66101

November 8, 2010

Prepared By:

Tetra Tech EM, Inc.
415 Oak Street
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INTRODUCTION

Tetra Tech EM Inc. (Tetra Tech) was tasked by the U.S. Environmental Protection Agency (EPA), under the Superfund Technical Assessment and Response Team (START) 3 contract, to conduct a Phase III Targeted Brownfields Assessment (TBA) for the Ehler's property (site or subject property) in Springfield, Missouri. The objective of the Phase III investigation was to define the extent of soil contamination identified during previous assessments, and investigate groundwater contamination, so that risks can be assessed and cleanup alternatives developed. This "abbreviated format" Analysis of Brownfields Cleanup Alternatives Report (ABCA Report) examines alternatives for cleanup of the soil contamination at the site, including preliminary cost estimates. The Phase III investigation report documenting soil and groundwater sampling and analysis activities will be submitted under separate cover.

SITE BACKGROUND AND DESCRIPTION

The Ehler's property is located at 1420 West College Street in Springfield, Greene County, Missouri. The site is located in the northwest ¼ of the northwest ¼ of Section 23, Township 29 North, Range 22 West (Appendix A, Figure 1). The geographic coordinates for the site are approximately 37° 12' 29.61" north latitude and 93° 18' 37.07" west longitude. The elevation of the site is approximately 1,241 feet above mean sea level as indicated on the U.S. Geological Survey (USGS) Springfield, Missouri, 7.5-Minute Topographic Map (USGS 1996). Topography is relatively flat on most of the site and slopes to the southeast near Jordan Creek. The site is a rectangular parcel that fronts on and is accessed from West College Street to the north. The site encompasses approximately 0.5491 acre of land that is approximately 184 feet long and 130 feet wide. The Greene County Assessor's office identifies the site as Parcel ID 881323213005.

The site is bounded to the north by West College Street; to the east and south lies Jordan Creek; to the west is LC Enterprises. Jordan Creek is the nearest surface water body; it bisects the southeastern portion of the lot and flows to the southwest. The site is located within the floodplain of Jordan Creek.

The site includes two one-story buildings, a concrete parking area to the north of the buildings, and a crushed rock area to the south surrounded by a chain link fence. The site is located in a mixed-use area of the City of Springfield. The site is currently occupied by Stone Effects, which constructs architectural cast concrete products using a rubber mold and in-house-made specialty molds. This location was historically occupied by a bulk oil storage facility/gasoline service station and a starter service. Based on historical uses of the property, solvents may have been released into an on-site septic system. During the Phase II environmental assessment conducted by Etech in December 2009, subsurface soil and

groundwater samples were collected for analysis for volatile organic compounds (VOC). However, chlorinated solvents were not detected in samples collected from either medium. During the site visit for a Phase II environmental site assessment, evidence of a former hydraulic lift was noted on the eastern side of the site. This lift may have been part of past operations conducted by former occupants of the site.

It is noted that a “No Further Remedial Action” letter was issued to Smith Starter Service (former site occupants) in 2006 by the Missouri Department of Natural Resources (MDNR) Hazardous Waste Program Tanks Section. This determination by MDNR was based on the stipulated non-residential use of the property.

FUTURE USE

According to draft figures provided by the City of Springfield depicting approximate limits of excavation, proposed/prospective site redevelopment is expected to generally include channel improvements of Jordan Creek. This prospective improvement action would likely require removal of petroleum hydrocarbon-contaminated soils on the subject property along the west side of Jordan Creek. Additionally, the Jordan Creek channel improvements would likely require removal and re-grading of existing surface structures.

SOURCE AREA CHARACTERIZATION

Total petroleum hydrocarbons-gasoline range organics (TPH-GRO) and associated VOCs benzene, xylene (total), and naphthalene are the primary contaminants of concern in soil at the Ehler’s property. These contaminants are consistent with the former uses/occupants of the property, which included a bulk oil storage facility/gasoline service station and a starter service.

Results of soil sampling indicate that most of the soil contamination exists in the subsurface at various depths, but generally in the depth range of 8 to 14 feet below ground surface (bgs). Concentrations of TPH-GRO and the VOCs above Missouri Risk-Based Corrective Action (MRBCA) Tier 1 Risk-Based Target Levels (RBTL) for both residential and non-residential land use have been identified in subsurface soils on the subject property (classified as Soil Type 2 – loam based on a subsurface soil sample for grain size analysis collected in August 2010). The soil samples collected during the Phase III investigation (conducted by Tetra Tech in August 2010) exhibited detectable concentrations of VOCs, polycyclic aromatic hydrocarbon (PAH), TPH-GRO, TPH-diesel range organics (TPH-DRO), TPH-oil range organics (TPH-ORO), and lead widely distributed across the site; depths of sampling ranged from 0.6 to 1.6 feet bgs at direct-push technology (DPT) location B-8 to 13 to 14 feet bgs at DPT locations B-1 and

B-12 (Figure 2, in Appendix A, depicts August 2010 soil sampling locations). Contaminants above the MRBCA Tier 1 RBTLs for residential use are widely distributed across the site in subsurface soils. However, the distribution of the contaminants above the MRBCA Tier 1 RBTLs for non-residential use is limited to the central and eastern portion of the site.

Groundwater samples were collected in October 2010 as part of the Phase III investigation conducted by Tetra Tech (monitoring well locations are depicted on Figure 3 in Appendix A). The VOCs benzene and naphthalene were reported above their respective MDNR Lowest Default Target Levels (LDTL) in samples MW-1 and MW-2. Naphthalene was reported above the LDTL in samples MW-3 and BW-1. The PAHs benzo(a)anthracene, naphthalene, and phenanthrene were reported above their respective LDTLs in sample MW-2. Total lead was reported in samples MW-2 and BW-1 at concentrations above the MRBCA LDTL for lead.

CLEANUP STANDARDS

The site is not yet enrolled in the MDNR Brownfields/Voluntary Cleanup Program (BVCP). However, once the site is enrolled in the BVCP, cleanup of the site likely will be performed to applicable soil RBTLs using procedures required by the BVCP.

IDENTIFICATION OF POTENTIAL CLEANUP ALTERNATIVES

Cleanup Objectives

The following cleanup objectives were determined to be applicable to the subject property:

- Prevent exposure pathways that could be or have been created by contaminated source materials (soil).
- Reduce contaminant levels to below MRBCA Tier 1 RBTLs to allow for Jordan Creek channel improvements and non-residential future use.
- Enroll the site in the MDNR BVCP.

Potential Cleanup Alternatives

The City of Springfield's proposed future plans for this site include channel improvements to Jordan Creek (based on draft figures provided by the City of Springfield depicting approximate limits of excavation). The channel improvements would likely require excavation, placement of clean fill materials, re-grading, and off-site disposal of contaminated soils.

Tetra Tech applied selected functions of Remedial Action Cost Engineering and Requirements (RACER™) Version 9.1.0 (2007) software to assist in evaluation of appropriate cleanup objectives and to obtain associated cost estimates. The following assumptions were used in RACER™, depending on the alternative evaluated:

- Excavating the area proposed for channel improvements (225 feet long, 30 feet wide, by 14 feet deep) as depicted on draft figures provided by the City of Springfield
- Transporting and disposing of excavated contaminated soil at the Springfield Sanitary Landfill as Special Waste
- Replacing approximately one-half of the excavated area with clean fill
- Demolishing the two existing on-site buildings and removing concrete surface materials.

Potential cleanup alternatives that were evaluated are listed below. The cost estimates provided are variable due to unknowns regarding final plans and funding for redevelopment. Although site-specific conditions were applied for cost estimating, RACER™ cost estimates provided may vary significantly from actual cleanup costs and are intended only for relative comparison. The RACER™ output is provided in Appendix B.

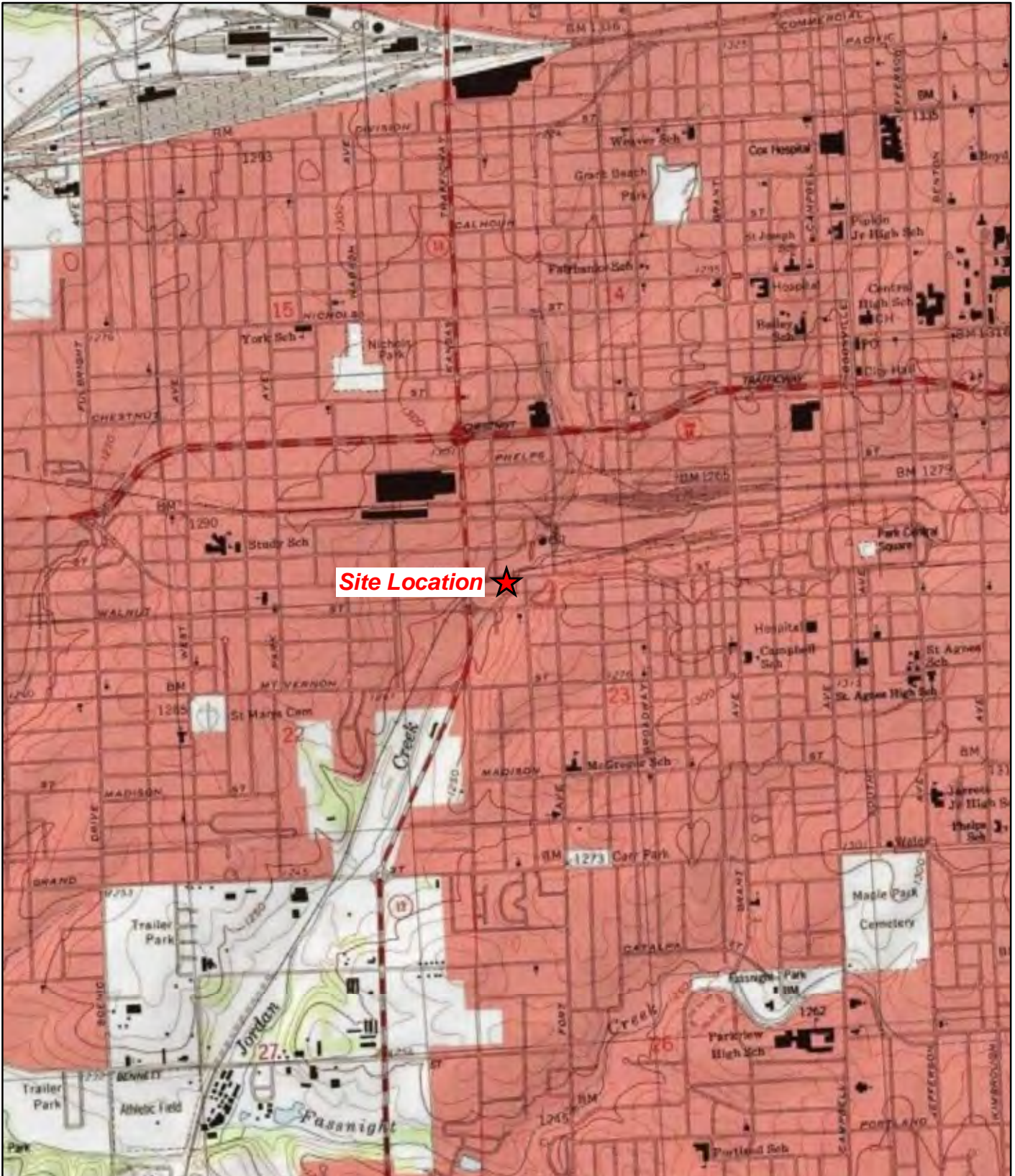
1. No action. The “No Action” alternative evaluation, as required by EPA, was considered but was determined not protective of human health or the environment because sources of soil contamination are left in place. No cost or implementation activities are required for this alternative.
2. Risk-based management including limited excavation and removal of only the contaminated areas as required by proposed construction/redevelopment activities, with reuse of non-contaminated soils as part of site backfilling, if possible. Enroll the site in the MDNR BVCP. Excavate soil in the area of proposed Jordan Creek channel improvements, dispose of excavated soil as Special Waste, demolish two on-site buildings and remove concrete surface materials, and backfill approximately one-half of the excavated area with clean fill. Based on the area proposed for channel improvements, the approximate area of proposed excavation, and analytical data for soil samples collected on site, 3,500 cubic yards of contaminated soil was estimated for excavation and disposal. Based on the assumptions described, this alternative was estimated to cost \$351,404.00.
3. Soil excavation and disposal. Enroll the site in the MDNR BVCP. Excavate contaminated soil in the area of proposed Jordan Creek channel improvements, excavate contaminated soil on the remainder of the site to the MRBCA Tier 1 RBTLs for residential use (assuming contaminated soil in depth range of 8 to 14 feet bgs), dispose of soil as Special Waste, demolish two on-site buildings and remove concrete surface materials, and re-use upper 8 feet of soil as backfill and supplement with clean fill. Based on the area proposed for channel improvements, the approximate area of proposed excavation, and analytical data for soil samples collected on site, a total of 6,686 cubic yards of contaminated soil was estimated for excavation and disposal. Based on the assumptions described, this alternative was estimated to cost \$633,612.00.

Recommended Cleanup Alternative

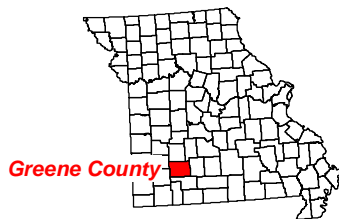
Risk-based management including limited soil removal in the area of proposed Jordan Creek channel improvements is the recommended cleanup alternative because it would allow for excavation and removal at only those areas as required by planned construction/redevelopment activities. Excavated soils would be disposed of at a local landfill or, with City of Springfield and MDNR BVCP approval, could be taken to other Brownfields redevelopment sites in the Jordan Valley West Meadows area for management and/or potential encapsulation.

APPENDIX A

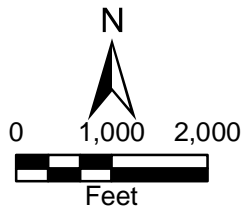
FIGURES



Site Location ★



Greene County



Ehler's Property
1420 West College Street
Springfield, Missouri

Figure 1
Site Location Map



X:\G9004\0002\015014\Project\msd\Figure1.mxd

Source: USGS Springfield, NE 7.5 Minute Topo Quad, 1996

Date: 07/16/10

Drawn By: Gustavo Orozco

Project No: X9004.L06.0002.015.014

W College Street

N Nettleton Ave

Jordan Creek

Former UST Location

1432

1420

B-3

B-4

B-2

B-9

B-7

B-8

B-5

B-6

B-10

B-12






B-13

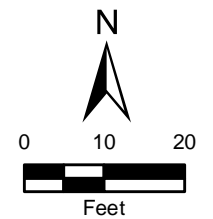
B-14

B-1

B-11

Legend

-  Phase III Boring Sample Location
-  Former Monitoring Well
-  Former Phase II Soil Boring/ Temporary Well Location
-  Former UST Location
-  Property Boundary
- UST Underground Storage Tank



Source: City of Springfield's City Owned Property Map, 2009

Ehler's Property
1420 West College Street
Springfield, Missouri

Figure 2
Sample Location Map



W College Street

N Nettleton Ave

Jordan Creek

Former UST Location

1432

1420

Approximate Location of Leach Field and Septic System




MW-1

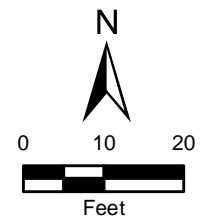
MW-2

BW-1

MW-3

Legend

-  Former Monitoring Well
-  Former Phase II Soil Boring/Temporary Well Location
-  Phase III Bedrock (BW) Monitoring Well
-  Phase III Shallow (MW) Monitoring Well
-  Former UST Location
-  Potential Former Lift Location
-  Property Boundary
- UST Underground Storage Tank



Source: City of Springfield's City Owned Property Map, 2009

Ehler's Property
1420 West College Street
Springfield, Missouri

Figure 3
Monitoring Well Location Map



APPENDIX B

RACER™ OUTPUT

Assumptions and Calculations

	Jordan Creek Channel	Area Adjacent to Jordan Creek Channel
Excavation Length (ft)	225	185
Excavation Width (ft)	30	77.5 (30+125)/2
Excavation Depth (ft)	14	14
Volume (BCY)	3500	3186 (only 8-14 ft is hauled away ~42.9%)
Assumed in-place density (lb/BCY)	3500	3500
Weight of excavated soil (ton)	6125	5576
Assumed expansion ratio (LCY/BCY)	1.3	1.3
Loose volume (LCY)	4550	4142
# of 26 CY semi-dump trucks (assume fill to 80% capacity)	219	199

RACER Assembly	Description	Quantity	Unit	Material	Labor	Equipment	Extended Cost	Comments
Excavation of Jordan Creek Channel - Scenario 1								
17030277	Excavate and load, bank measure, medium material, 2 C.Y. bucket, hydraulic excavator	3,500	BCY	-	1.44	0.81	7,875.00	
17030418	Delivered & Dumped, Backfill with Stone	125	BCY	30.98	1.21	1.13	4,165.00	stone for temporary haul road
17030423	Unclassified Fill, 6" Lifts, Off-Site, Includes Delivery, Spreading, and Compaction	1,750	CY	7.91	1.49	1.07	18,322.50	backfill with off-site clean soils, assume 50% of excavated soil will be replaced
33080584	Plastic Laminate Waste Pile Cover	10,000	SF	0.18	0.06	-	2,400.00	RACER estimated ~36,000 SF of laminate, this estimate was over-ridden to 10,000 SF
33170803	Decontaminate Heavy Equipment	1	EA	-	702.49	-	702.49	
17030224	996, 4.0 CY, Wheel Loader	23	HR	-	73.27	90.46	3,765.79	
17030288	26 CY, Semi Dump	218	HR	-	89.93	74.68	35,884.98	
(user input)	Springfield Sanitary Landfill Special Waste Disposal Fee	6,125	TON	28.65	-	-	175,481.25	
(user input)	Springfield Sanitary Landfill Vehicle Tipping Fee	219	EA	20.00	-	-	4,380.00	
Excavation of Jordan Creek Channel Subtotal							252,977.01	
Excavation of Area Adjacent to Jordan Creek Channel - Scenario 2								
17030278	Excavate and load, bank measure, medium material, 3-1/2 C.Y. bucket, hydraulic excavator	7,434	BCY	-	1.17	1.03	16,355.37	
17030415	On-Site Backfill for Large Excavations, Includes Compaction	5,515	ECY	0.05	1.13	0.98	11,911.77	assume top 8 ft of soil will be reused as backfill (57% of excavated soil reused)
17030418	Delivered & Dumped, Backfill with Stone	266	BCY	30.98	1.23	1.15	8,857.41	stone for temporary haul road
17030423	Unclassified Fill, 6" Lifts, Off-Site, Includes Delivery, Spreading, and Compaction	4,000	CY	7.91	1.51	1.09	42,042.21	fill remaining excavation with offsite soil
33080584	Plastic Laminate Waste Pile Cover	10,000	SF	0.18	0.06	-	2,400.00	RACER estimated ~36,000 SF of laminate, this estimate was over-ridden to 10,000 SF
33170803	Decontaminate Heavy Equipment	1	EA	-	712.67	-	712.67	
17030224	996, 4.0 CY, Wheel Loader	21	HR	-	73.27	90.46	3,438.33	
17030288	26 CY, Semi Dump	199	HR	-	89.93	74.68	32,757.39	
(user input)	Springfield Sanitary Landfill Special Waste Disposal Fee	5,576	TON	28.65	-	-	159,752.40	
(user input)	Springfield Sanitary Landfill Vehicle Tipping Fee	199	EA	20.00	-	-	3,980.00	
Excavation of Area Adjacent to Jordan Creek Channel Subtotal							282,207.56	
Building Demolition - Scenarios 1 & 2								
17020105	Single-level, Steel, Nonexplosive, Building Demolition, Excludes Foundation Demolition, Excludes Dump Fees	48,000	CF	-	0.18	0.08	12,480.00	Assumed 4,000 SF x 12 FT = 48,000 CF.
17020401	Dump Charges	1,628	EA	19.31	-	-	31,436.68	
17030222	926, 2.0 CY, Wheel Loader	23	HR	-	74.33	54.08	2,953.43	
17030287	20 CY, Semi Dump	140	HR	-	91.23	65.68	21,967.40	
Building Demolition Subtotal							68,837.51	
Concrete Pavement and Building Slab Demolition - Scenarios 1 & 2								
17020208	Demolish Mesh Reinforced Concrete to 6" Thick with Power Equipment	167.59	CY	-	86.43	23.61	18,441.60	Building slab: 4,000 SF; Concrete pavement: 5,050 SF (130x35 FT and 20x30 FT)
17020401	Dump Charges	251.39	EA	19.31	-	-	4,854.34	
17030220	910, 1.25 CY, Wheel Loader	5	HR	-	74.33	40.38	573.55	
17030284	8 CY, Dump Truck	39	HR	-	91.23	55.45	5,720.52	
Concrete Pavement and Building Slab Demolition Subtotal							29,590.01	

	Scenario 1	Scenario 2
Excavation of Jordan Creek Channel	252,977.01	252,977.01
Excavation of Area Adjacent to Jordan Creek Channel Subtotal	-	282,207.56
Building Demolition Subtotal	68,837.51	68,837.51
Concrete Pavement and Building Slab Demolition Subtotal	29,590.01	29,590.01
Total	351,404.53	633,612.09