452-02

DEPARTMENT OF THE ARMY
Office of the Assistant Chief of Staff for Installation Management
BRAC Division
Seneca Army Depot, Romulus, NY

MEMORANDUM FOR RECORD 1 August 2018

SUBJECT: FY18 Environmental Liabilities for WBS 36760.1006, SEAD-006, Ash Landfill Site at Seneca Army Depot

This memorandum serves as formal documentation of the information used to develop the Cost-To-Complete (CTC) estimate for SEAD 006 during the 2018 data call. Estimators experience is documented on the Estimator Experience Form, per the Federal Accounting Standards Advisory Board (FASAB) Handbook Technical Release 2 (Enclosure 1). The Environmental Liabilities training is documented in Enclosure 1.

Future monitoring cost is based on task order pricing for monitoring. RA(O) in the form of groundwater monitoring costs were obtained from the contract task order. The ROD implementation was initiated in 2007. Of the expected 15 years of monitoring expected per the ROD (Enclosure 2), 5 years remain.

Future monitoring costs are based on Contract #: W912DY-09-D-0062, D.O. 0023 dated 30 May 2016 (Enclosure 3), and Contract W912DY-09-D-0062 Task Order 23 Date 30 Mar 2016 and Contract W912DS-13-D-0005, Job Order Contract for Seneca AD.

Site Closeout and Well Abandonment Engineering Estimate and Contract basis are included in Enclosure 5. Site Closeout and Well Abandonment CTC guidance is expected to change in FY19. The decision document cost of $43,176.00 for another Seneca Army Depot site is assumed to be adequate for site closeout documentation. The basis of this is a FY11 existing contract, which is current and open. The well abandonment engineering estimate is based upon a contract amount for field construction, the FY18 CTC Data Call Memorandum guidance and engineering estimate of the hours needed.

The Estimate Summary Table is included in Enclosure 6.

The required Land Use Control management of this AOC is included in SEAD 009.

Site History: The Ash Landfill (SEAD-006) (HQAES WBS# 36760.1006) OU occupies approximately 45 acres along the western boundary of SEAD. Primary contaminants are volatile organic compound (VOCs), semi-volatile organic compound (SVOCs) [mainly polycyclic aromatic hydrocarbons (PAHs)] and metals. The source of the VOCs was a 2 acre area in the landfill where solvent was disposed at the Ash Landfill site.

A non-time critical removal action conducted between August 1994 and June 1995. The latter consisted of excavation and thermal treatment of VOC-impacted soils using the low temperature thermal desorption process.

A ROD was signed in 2004 that included the RAs of excavation and off-site disposal of debris piles, establishment and maintenance of a vegetative soil cover for the Ash

Landfill and the adjacent NCFL, and installation of three in situ permeable bio-reactive barrier walls.

The LUC Inspection and 5 year Review for this site has been combined with SEAD-009. These requirements are now included with SEAD-009 and do not appear with this site.

The Final Report for the Annual Report for 2015 for the groundwater monitoring is not yet approved by EPA and the 2014 Annual Report is included (enclosure 4).

Current Site Status: In-situ treatment and monitoring of ground water is required until ground water and soil meet cleanup standards. Groundwater data has demonstrated the need for regeneration of the bioreactive wall, which is consistent with industry regeneration time frames. A contract was awarded 30 March 2016 to accomplish biowall regeneration of available organic content. The field work for regeneration is complete.

Exit Strategy: The RA(O) includes monitoring until GW cleanup standards have been met, followed by site closeout documentation. The ramp-down strategy is detailed in the LTM plan. This plan contains provisions to reduce monitoring requirements as cleanup goals are met, as reviewed in the five year reviews, hence six year increments for costs are shown. Continued monitoring is expected due to natural attenuation factors in the in-situ treatment, a rolling 30 year estimate is used. Land use controls are required to maintain landfill covers. The LUC will be in perpetuity however costing is estimated for 30 years IAW the Army Defense Environmental Restoration Program (DERP) Manual. LUC Cost for this site is included in SEAD 009 as part of the installation LUC review and the 5 Year review program.

Enclosures:
1. Estimator's Experience Form
2. Final Record of Decision, Ash Landfill, January 2005
3. Contract #: W912DY-09-D-0062, D.O. 0023 dated 30 May 2016; Contract W912DS-13-D-0005, Job Order Contract for Seneca AD; JOC based Engineering Estimate for light clearing and grubbing
4. Final Annual Report and Year 6 Review for the Ash Landfill dated April 2014
5. Engineering Estimate for Site Closeout and Well Abandonment
6. USACE Oversight Cost Estimate, FY18 Fully burdened rates and Estimate Summary Table

Engineering Estimate Assumptions:

Well Abandonment (LTM)
1. Three well groups: Group 1 (19 wells), Biowall (11 wells), Trench (11 wells)= 41 Wells
2. Well depth: 15 feet
3. Well diameter: 2 inches
4. Formation type: Unconsolidated
5. Method: Overdrill/removal

Site Closeout Documentation (LTM phase):
1. Site Closeout is moderate complexity
2. Kick-off, review and regulatory meetings included
3. Work Plans and reports- one completion report

4. Documents (16 Boxes) will be stored for 30 years

Owner Support Assumptions:

COE oversight costs are estimated by estimated hours and rates shown in the 3 April Data Call Memorandum. Estimated hours are based upon project and technical management requirements for scoping, contract management and stakeholder interaction over the life of the project.

Cost Summary SEAD-6, 3, 8, 14, 15:

RA(O)

Groundwater Monitoring (Enclosure 3) $51,594.03 x 6 years=$309,564.18 X FY17 Escalation Factor x 1.0313=	**$ 319,253.54**	
Clearing/Grubbing (Enclosure 4) $4,326.10 x 6 years= $25,956.60	**$ 25,956.60**	
Owner Support Cost (Enclosure 6)=$3,536.89 X 6 years =	**$21,221.34**	
RA (O) Subtotal 6 years =$348,747.03		
RA(O) = Subtotal x 5 for 30 years=		**$1,743,735.15**
LTM Well Abandonment and Site Close-out (Enclosure 5)		**$319,140.15**
Total Cost		**$ 2,062,875.30**

Material Change: The 18 March 2018 FY18 guidance memorandum states that the material change will be calculated with HQAES. A material change is expected from FY17 due to the FY17 estimate contained a "TBD" for updated Engineering Estimate for Well Abandonment and Closeout; and Site Clearing and Grubbing will be required to access wells.

Estimator/Peer Reviewer:

Estimator signature: BATTAGLIA.RANDALL.W.12288167 24 Digitally signed by BATTAGLIA.RANDALL.W.1228816724 DN: c=US, o=U.S. Government, ou=DoD, ou=PKI, ou=USA, cn=BATTAGLIA.RANDALL.W.1228816724 Date: 2018.08.01 15:56:40 -04'00'

Printed Name:_____ Date: _____

"I have reviewed the supporting documentation; for estimating methodology, facts and assumptions are appropriate for the site cost and the documentation properly and completely supports the estimate."

Peer Reviewer signature: _____

ESTIMATOR EXPERIENCE

ESTIMATOR NAME: Randall Battaglia	POSITION: Project Manager/BEC
LOCATION: Seneca Army Depot	YEARS OF EXPERIENCE: 32 years
EMAIL: Randy.W.Battaglia@usace.army.mil	PHONE NUMBER: 347-213-1565

DESCRIPTION: (Insert description of experience here, such as educational background, training, etc.)
B.S. Chemical Engineering, 1982; Certified Project Manager, 2007

Work Experience: Project Manager; USACE, 1995-Present: Prepare and manage Life-Cycle Cost for HTRW projects; executes the COE project management business process & establishing a project management plan with a project development team consisting of interdisciplinary, regional or other agencies teams to execute & ensure all projects meet customer, budgetary, safety, scope and schedule requirements during the life cycle of the project, under changing management parameters. Represents the Army as an Alternate for the installation manager in all customer/sponsor, congressional, public contacts, including public meetings, organizations, property transfers with the state, EPA, county, & independent organizations interested in the projects. Served also as the BRAC Environmental Coordinator, 2016-Present.

Environmental Coordinator, Seneca Army Depot, 1985-1995; performed all program management, cost estimation, budget regulatory, permitting, and other management for the environmental program at the active Seneca Army Depot for hazardous waste, TSDF, air, wetlands, CERCLA, RCRA, engineering projects, etc.

Process Engineer, IEC Electronics, 1983-1985 Process engineering for production, product development, personnel, process & Quality

Relevant Continuing Education: Network Systems Analysis; Project Management for Military Projects & HTRW projects; Environmental Auditing; Economic Assessment; Various Project Management & environmental remediation courses; Cost Estimating

SITE TYPE REVIEWED: Insert site number(s) at which experience gained for each site type to the maximum extent possible.

	SITE TYPE	SITE NUMBER		SITE TYPE	SITE NUMBER
	Above Ground Storage Tank	SEAD 5,59,71		Open Burn	SEAD 23, 24, 006-R-01, 003-R-01, 007-R-01
	Burn Area	SEAD 24,45,25,26		Plating Shop	
	Chemical Disposal	SEAD 13,72,4		POL (Petroleum/Lubricant Lines	SEAD 9
	Contaminated Buildings	SEAD 12, 16,17, 3		Radioactive Waste Area	SEAD 012,48,72, 63, NRC License closeout
	Contaminated Fill	SEAD 3, 9,4		Sewage Treatment Plant	SEAD 20,21
	Contaminated Groundwater	SEAD 025,006, 001-R-01, 023, 064B&D, 041		Small Arms Range	SEAD 57, 46, 120B,122A,122B
	Contaminated Sediments	SEAD 4, 3,		Soil Contamination After Tank Removal	SEAD 59,
	Contaminated Soil Piles	SEAD 5		Spill Site Area	SEAD 122
	Dip Tank			Storage Area	SEAD 123
	Disposal Pit/Dry Well			Surface Disposal Area	
	Explosive Ordnance Disposal Area	SEAD 23, 24, 006-R-01, 003-R-01, 007-R-01		Training and Maneuver Area	
	Fire/Crash Training Area	SEAD 025,026		Underground Storage Tank	SEAD 27
	Firing Range			Underground Tank Farm	
	Incinerator	SEAD 006, 001-R-01,019, 018		Unexploded Munitions/Ordnance	SEAD 115
	Industrial Discharge			Wash rack	
	Landfill	SEAD 006, 064 A,B&D, 011,		Waste Lines	
	Maintenance Yard	SEAD 122		Waste Treatment Plant	
	Oil Water Separator	SEAD 27			

Enclosure 1

ENCLOSURE 2

FINAL

RECORD OF DECISION

FOR

ASH LANDFILL

SENECA ARMY DEPOT ACTIVITY
ROMULUS, NEW YORK

Prepared for:

SENECA ARMY DEPOT ACTIVITY
ROMULUS, NEW YORK

and

UNITED STATES ARMY CORPS OF ENGINEERS
4820 UNIVERSITY SQUARE
HUNTSVILLE, ALABAMA

Prepared By:

PARSONS
150 Federal St, 4th Floor
Boston, Massachusetts

Contract Number: DACA87-95-D-0031
Delivery Order 0022

January 2005

ENCL 2

natural biodegradation, since the [illegible]
hydrogen, a substance that is used up in microbial dechlorination. This would decrease contaminan levels, which can be expected to significantly reduce the time to achieve ARAR compliance compared to Alternatives MC-3, MC-5 and MC-6.

Alternatives MC-5 and MC-6 include surface water discharge of treated groundwater. Discharge requirements are generally the federal and State AWQC. The discharge from the groundwater treatment system would be designed to meet the federal AWQC and the anti-degradation limits.

Alternatives MC-5 and MC-6 are expected to achieve other ARARs including the RCRA requirements for treatment facilities, the Department of Transportation (DOT) requirements for off-site transportation of any residual materials, and the New York Solid and Hazardous Waste Regulations and the Occupational Safety and Health Act (OSHA). In addition, the operation of the treatment system in Alternative MC-4 would comply with federal and state air standards.

10.2.3 Long-Term Effectiveness and Permanence

Alternatives SC-1, MC-1 and MC-2 would not remove or contain contaminants in the groundwater in a continuous or active manner, with the exception of what would be removed by the reactive barrier wall that is currently in place and operating. Contaminants would continue to migrate and the volume of contaminated groundwater would increase. The No-Action alternative, MC-1, and the alternative water supply alternative, MC-2, are not considered to be effective over the long-term because contaminated groundwater, other than that captured via the reactive barrier wall, remains on-site and some migration off of the property would occur. This condition currently does not affect the drinking water of off-site residents and groundwater modeling has indicated that the concentrations of contaminants would be below drinking water standards by the time the groundwater reaches these wells. These alternatives would require long-term monitoring and sampling.

Alternatives MC-3, MC-5 and MC-6 are all expected to be equal in providing long-term permanence, since each alternative would operate until the desired concentration levels are achieved. The limiting factor in achieving this goal is the rate at which contaminants can be flushed out of the soil matrix. Since the aquifer matrix is glacial till and is high in clay content, diffusion is likely to play an important role in releasing contamination from the aquifer. This means the time for cleanup would be long, estimated to be approximately 45 years. MC 3a is expected to take 15 years. ? Time - 6a

Alternative SC-2 is ranked high for long-term effectiveness and permanence since all materials would be excavated and disposed of in an off-site landfill. Once in the landfill, the contaminated materials are permanently entombed. However, since this alternative does not permanently fix the contaminants and involves such large volume of soil, these wastes may not be as permanently entombed as Alternative SC-4. Therefore, although SC-2 is ranked high for permanence, Alternative

11.0 SELECTED REMEDY

Based on an evaluation of the various options, the selected remedy is Alternative SC-5 for source control and Alternative MC-3a for migration control (Figure 11-1). The elements that compose the selected remedy include the following:

- Excavation and off-site disposal of debris piles and establishment and maintenance of a vegetative soil cover for the Ash Landfill and the Non-Combustion Fill Landfill (NCFL) for source control;
- Installation of three in-situ permeable reactive barrier walls, and maintenance of the proposed walls and the existing wall for migration control of the groundwater plume;
- A Contingency Plan will be developed to include one of the following options; provision of an alternative water supply for potential downgradient receptors (farmhouse) or air sparging of the plume in the event that groundwater conditions downgradient of the recommended remedial action described above exceed trigger values;
- Land Use Controls (LUCs) to attain the remedial action objectives; and,
- Completion of a review of the selected remedy every five-years (at minimum), in accordance with Section 121(c) of the CERCLA. If a wall material other than iron is selected, the Army will conduct a review of the remedy's effectiveness one year after the walls are installed. Subsequent annual reviews will be performed until the first five year review. The typical five year review schedule will be followed thereafter.

Land Use Control Performance Objectives

The LUC performance objectives for the Ash Landfill are to:

- Prevent access or use of the groundwater until cleanup levels are met.
- Maintain the integrity of any current or future remedial or monitoring system such as monitoring wells and impermeable reactive barriers.
- Prohibit excavation of the soil or construction of inhabitable structures (temporary or permanent) above the area of the existing groundwater plume.
- Maintain the vegetative soil layer over the ash fill areas and the NCFL to limit ecological contact.

The groundwater LUCs will be continued until such time that the concentration of hazardous substances in the groundwater have been reduced to levels that allow for unlimited exposure and unrestricted use. Intrusive restrictions for those areas requiring a vegetative soil cover will continue indefinitely. These land use controls will be implemented over the area of the groundwater plume.

NCFL, and the Ash Landfill, as shown on Figure 1-1.

LUC Remedial Design

In order to implement the Army's remedy, which includes the imposition of land use controls, a LUC Remedial Design for the Ash Landfill will be prepared which satisfies the applicable requirements o Paragraphs (a) and (c), Environmental Conservation Law (ECL) Article 27, Section 1318 Institutional and Engineering Controls. In addition, the Army will prepare an environmenta. easement for the Ash Landfill, consistent with Section 27-1318(b) and Article 71, Title 36 of ECL, in favor of the State of New York and the Army, which will be recorded at the time of the property's transfer from federal ownership. A schedule for completion of the draft Ash Landfill LUC Remedial Design Plan (LUC RD) will be completed within 21 days of the ROD signature, consistent with Section 14.4 of the Federal Facilities Agreement (FFA).

The Army shall implement, inspect, report, and enforce the LUCs described in this ROD in accordance with the approved LUC RD. Although the Army may later transfer these responsibilities to another party by contract, property transfer agreement, or through other means, the Army shall retain ultimate responsibility for remedy integrity. Should the Army transfer these responsibilities, the Army shall provide timely written notice to the regulators of the transferee which shall include the entity's name, address, and general remedial responsibility.

During the excavation of the Debris Piles, the Incinerator Cooling Water Pond area will be re-graded to fill the pond.

The five-year reviews are intended to evaluate whether the response actions remain protective of public health and the environment, and they will consist of document review, ARAR review, interviews, inspection/technology review, and reporting.

A contingency plan will be developed as part of this preferred alternative. The contingency plan will include additional monitoring and air sparging, as necessary, and implementation of an alternative water supply for potential downgradient receptor (farmhouse), if required based on trigger criteria. Following installation of the reactive walls, groundwater from monitoring well MW-56 will be analyzed, and the VOC results will be compared to the Class GA groundwater standards (trigger criteria). If a statistical analysis of the data for this well shows exceedances of Class GA standards, additional remedial action would be required. Temporary wells will be installed in the vicinity of MW-56, and the results will be used to develop an approach for air sparging. A description of the air sparging process is summarized in Alternative MC-3. If concentrations at MW-56 continue to exceed the trigger values following air sparging, an activated carbon system for the farmhouse water supply system would be installed or public water would be delivered to the house. More extensive air sparging would be performed until trigger values are no longer exceeded.

Alternative SC-5 was selected as the preferred source control alternative because the vegetative co will be an effective barrier against exposure and is therefore one of the highest ranked alternati for protectiveness to human and ecological receptors. The alternative minimizes the negat short-term effects, such as truck traffic and dust problems, that a large excavation would cause. SC will be compliant with all ARARs. This alternative also minimizes the amount of off-site land filli that will be required. SC-5 is the easiest to implement and has the lowest cost.

Alternative MC-3a was selected as the preferred management of migration alternative because it wi achieve substantial risk reduction by chemically destroying the dissolved chlorinated ether compounds in groundwater. This alternative is effective in achieving these reductions. Th alternative will be protective of human health and the environment by preventing off-site migratio of the VOC plume. Monitoring of the plume will ensure that downgradient receptors are protected The monitoring plan will provide adequate warning should monitoring data indicate that the plume i threatening the drinking water supply wells of site neighbors, i.e., the farmhouse wells.

Monitoring

Section A - Solicitation/Contract Form

AWARD NARRATIVE

Task Order 0023, which contains Firm Fixed-Price (FFP) tasks, is being issued to Parsons Government Services, Inc for Remedial Action at Seneca Army Depot Activity, Romulus, NY, EPA Site ID# NY0213820830, NY Site ID# 8-50-006 in accordance with Performance Work Statement Revision 2, dated March 24, 2016.

The period of performance is date of award through March 30, 2018.

US Department of Labor Wage Determination Number 15-2381, Revision 1, dated March 1, 2016 shall be used with project task order.

The Terms and Conditions of the basic contract, W912DY-09-D-0062 takes precedence in the case of any ambiguity or conflict.

This task order is awarded in the amount of $1,211,190.20 of which $637,951.83 is being funded at the time of award.

Task	Description	Type	Amount	Total
1	UFP-QAPP and QASP	FFP	7,063.20	7,063.20
2	GIS	FFP	3,908.96	3,908.96
2a	Optional, Additional GIS per FY	FFP	1,525.90	
3	Long Term Monitoring of The OB Grounds	FFP		
3a	(FY17) First Annual Groundwater Monitoring	FFP	21,453.84	21,453.84
3b	Optional, (FY18) Second Annual Groundwater Monitoring	FFP	21,457.76	
3c	Optional, (FY19) Third Annual Groundwater Monitoring	FFP	21,461.68	
3d	Optional, (FY20) Fourth Annual Groundwater Monitoring	FFP	21,465.59	
3e	Optional, (FY21) Fifth Annual Groundwater Monitoring	FFP	21,469.51	
4	Long Term Monitoring of the Fire Training and Demonstration Pad Area	FFP		
4a	(FY17) First Annual Groundwater Monitoring	FFP	26,049.47	26,049.47
4b	Optional, (FY18) Second Annual Groundwater Monitoring	FFP	26,080.17	
4c	Optional, (FY19) Third Annual Groundwater Monitoring	FFP	26,110.87	
4d	Optional, (FY20) Fourth Annual Groundwater Monitoring	FFP	26,141.57	
4e	Optional, (FY21) Fifth Annual Groundwater Monitoring	FFP	26,172.27	
5	Long Term Monitoring of the Ash Landfill Operable Unit	FFP		
5a	(FY17) First Annual Groundwater Monitoring	FFP	51,594.03	51,594.03
5b	Optional, (FY18) Second Annual Groundwater Monitoring	FFP	51,686.28	
5c	Optional, (FY19) Third Annual Groundwater Monitoring	FFP	51,778.54	
5d	Optional, (FY20) Fourth Annual Groundwater Monitoring	FFP	51,870.79	
5e	Optional, (FY21) Fifth Annual Groundwater Monitoring	FFP	51,963.04	
6	Ash Landfill Operable Unit Blowall Recharge	FFP	440,038.65	440,038.65
7	Long Term Monitoring of the Deactivation Furnaces Operable Unit	FFP		
7a	(FY17) First Annual Groundwater Monitoring	FFP	23,146.49	23,146.49
7b	Optional, (FY18) Second Annual Groundwater Monitoring	FFP	23,178.47	
7c	Optional, (FY19) Third Annual Groundwater Monitoring	FFP	23,210.46	
7d	Optional, (FY20) Fourth Annual Groundwater Monitoring	FFP	23,242.44	
7e	Optional, (FY21) Fifth Annual Groundwater Monitoring	FFP	23,274.43	
8	Monitoring of LUCs at Various Sites	FFP		
8a	(FY17) First Annual Monitoring Event	FFP	17,934.42	17,934.42

$51,594.03 * 6 = $309,564.18 ←

x 1.0313 EDC = 319,253.54

and 3

8b	Optional, (FY18) Second Annual Monitoring Event	FFP	17,934.42	
8c	Optional, (FY19) Third Annual Monitoring Event	FFP	17,934.42	
8d	Optional, (FY20) Fourth Annual Monitoring Event	FFP	17,934.42	
9	Monitoring of LUCs at Various Munition Sites	FFP		
9a	(FY17) First Annual Monitoring Event	FFP	5,895.00	5,895.00
9b	Optional, (FY18) Second Annual Monitoring Event	FFP	5,895.28	
9c	Optional, (FY19) Third Annual Monitoring Event	FFP	5,895.28	
9d	Optional, (FY20) Fourth Annual Monitoring Event	FFP	5,895.28	
10	Five-year Review	FFP	27,488.41	27,488.41
11	Community Relations Support	FFP	13,379.36	13,379.36
11a	Optional, Additional Meetings	FUP	8,646.02	
12	Optional, Administrative Record	FFP	1,013.48	
	Totals		$1,211,190.20	$637,951.83

ORDER FOR SUPPLIES OR SERVICES

1. CONTRACT/PURCH. ORDER/ AGREEMENT NO.	2. DELIVERY ORDER/ CALL NO.	3. DATE OF ORDER/CALL (YYYYMMMDD)	4. REQ./ PURCH. REQUEST NO.	5. PRIORITY
W912DY-09-D-0062.	0023	2016 Mar 30	W91YQ0[illegible]	

6. ISSUED BY	CODE W912DY	7. ADMINISTERED BY (If other than 6)	CODE W912DY	8. DELIVERY FOR
US ARMY ENGINEERING & SUPPORT CENTER CEHNC-OT 4820 UNIVERSITY SQUARE HUNTSVILLE AL 35816-1822		DIRECTORATE OF CONTRACTING - HNC ATTN: MICHELLE BLACKMON 256-895-2631 HUNTSVILLE AL 35816		[X] DESTINATION [ ] OTHER (See Schedule if other)

9. CONTRACTOR	CODE 1BVK6	FACILITY	10. DELIVER TO FOB POINT BY (Date) (YYYYMMMDD)	11. MARK IF BUSINESS IS
NAME AND ADDRESS: PARSONS GOVERNMENT SERVICES INC. MICHELLE SMITH 100 W WALNUT ST PASADENA CA 91124-0001			SEE SCHEDULE	[ ] SMALL [ ] SMALL DISADVANTAGED [ ] WOMEN-OWNED
			12. DISCOUNT TERMS Net 30 Days	
			13. MAIL INVOICES TO THE ADDRESS IN BLOCK See Item 16	

14. SHIP TO	CODE W912DY	15. PAYMENT WILL BE MADE BY	CODE 884146	MARK ALL PACKAGES AND PAPERS WITH IDENTIFICATION NUMBERS IN BLOCKS 1 AND 2.
SEE SCHEDULE SEE SCHEDULE SEE SCHEDULE SEE SCHEDULE		US ARMY ENG & SUP CENTER - FINANCE OFFIC US ARMY CORPS OF ENGRS FINANCE CTR 4772 INTEGRITY DRIVE MILLINGTON TN 38054-5005		

16. TYPE OF ORDER			
DELIVERY/ CALL	X	This delivery order/call is issued on another Government agency or in accordance with and subject to terms and conditions of above-numbered contract:	
PURCHASE		Reference your quote dated Furnish the following on terms specified herein. REF:	

ACCEPTANCE. THE CONTRACTOR HEREBY ACCEPTS THE OFFER REPRESENTED BY THE NUMBERED PURCHASE ORDER AS IT MAY PREVIOUSLY HAVE BEEN OR IS NOW MODIFIED, SUBJECT TO ALL OF THE TERMS AND CONDITIONS SET FORTH, AND AGREES TO PERFORM THE SAME.

Parsons Gov Services	[signature]	Don Sturgeon VP	3/30/16
NAME OF CONTRACTOR	SIGNATURE	TYPED NAME AND TITLE	DATE SIGNED (YYYYMMMDD)

[X] If this box is marked, supplier must sign Acceptance and return the following number of copies: 3/30/16

17. ACCOUNTING AND APPROPRIATION DATA/ LOCAL USE

See Schedule

18. ITEM NO.	19. SCHEDULE OF SUPPLIES/ SERVICES	20. QUANTITY ORDERED/ ACCEPTED*	21. UNIT	22. UNIT PRICE	23. AMOUNT
	SEE SCHEDULE				

* If quantity accepted by the Government is same as quantity ordered, indicate by X. If different, enter actual quantity accepted below quantity ordered and circle it.

24. UNITED STATES OF AMERICA		25. TOTAL	$37,551.83
TITLE: CONTRACTING / ORDERING OFFICER	BY: MULLADY.RICHARD.J.1090040282	26. DIFFERENCES	

27a. QUANTITY IN COLUMN 20 HAS BEEN

[ ] INSPECTED [ ] RECEIVED [ ] ACCEPTED, AND CONFORMS TO THE CONTRACT EXCEPT AS NOTED

b. SIGNATURE OF AUTHORIZED GOVERNMENT REPRESENTATIVE	c. DATE (YYYYMMMDD)	d. PRINTED NAME AND TITLE OF AUTHORIZED GOVERNMENT REPRESENTATIVE

e. MAILING ADDRESS OF AUTHORIZED GOVERNMENT REPRESENTATIVE	28. SHIP NO.	29. DO VOUCHER NO.	30. INITIALS
	[ ] PARTIAL [ ] FINAL	32. PAID BY	33. AMOUNT VERIFIED CORRECT FOR
f. TELEPHONE NUMBER / g. E-MAIL ADDRESS			
36. I certify this account is correct and proper for payment.	31. PAYMENT		34. CHECK NUMBER
a. DATE (YYYYMMMDD) / b. SIGNATURE AND TITLE OF CERTIFYING OFFICER	[ ] COMPLETE [ ] PARTIAL [ ] FINAL		35. BILL OF LADING NO.

37. RECEIVED AT	38. RECEIVED BY	39. DATE RECEIVED (YYYYMMMDD)	40. TOTAL CONTAINERS	41. SR ACCOUNT NO.	42. SR VOUCHER NO.

3.5 Task 5, (CLIN 0005) DESCRIPTION OF SERVICES FOR LONG TERM MONITORING OF THE ASH LANDFILL OPERABLE UNIT: This is a firm fixed price task.
Objective: Conduct a RA in accordance with the accepted UFP-QAPP, SAP, Seneca LTM Plan, and all applicable standards such that the objective of this PWS is met. The RA shall include annual ground water monitoring to include water level and water quality monitoring and preparation of annual report summarizing the results of each annual event. The annual ground water monitoring shall include two biannual monitoring events at mid-year and end-of-year.

3.5.1 Task 5a, CLIN 0005a (FY17)) FIRST ANNUAL GROUNDWATER MONITORING EVENT. Refer to historical project documentation of site location, historical information, and boundaries.

3.5.2 Task 5b, (Optional) (CLIN 0005b (FY18)) SECOND ANNUAL GROUNDWATER MONITORING EVENT. Refer to historical project documentation of site location, historical information, and boundaries.

3.5.3 Task 5c, (Optional) (CLIN 0005c, (FY19)) THIRD ANNUAL GROUNDWATER MONITORING EVENT. Refer to historical project documentation of site location, historical information, and boundaries.

3.5.4 Task 5d, (Optional) (CLIN 0005d, (FY20)) FOURTH ANNUAL GROUNDWATER MONITORING EVENT. Refer to historical project documentation of site location, historical information, and boundaries.

3.5.5 Task 5e, (Optional) (CLIN 0005e, (FY21)) FIFTH ANNUAL GROUNDWATER MONITORING EVENT. Refer to historical project documentation of site location, historical information, and boundaries.

3.5.6 All subtasks listed above shall meet the following:

3.5.7 Performance Standard: Field work, quality, and analysis of said data shall meet the following standards:
- QC deliverables and QA inspections/review demonstrate that the work was performed in accordance with the UFP-QAPP, SAP, Seneca LTM Plan, applicable laws, regulations, and guidance documents.

3.5.8 AC: Conduct the RA in accordance with the accepted/approved UFP-QAPP, and Seneca LTM Plan. QC data submitted meets requirements described in the most recent geophysics and chemistry DIDs.

- No more than 3-4 CARs/948s for non-critical violations and/or 1 CAR/948 for critical violation. No unresolved corrective action requests.
- All final data and QC tests/documentation submitted. Government QA acceptance of QC tests/documentation gained.
- No Class "A" Safety accidents, contractor at fault; No Class "B", contractor at Fault, no more than 1 non-explosive Class "C" accident; and <2 non-explosive related Class "D" accidents, IAW AR 385-40.
- Major safety violations, no more than 1 non-explosive related safety violation.
- Minor safety violations, no more than 2 safety violations.
- Zero letters of reprimand, grievances, or formal complaints

3.5.9 Measurement / Monitoring: Periodic inspection/review of field work. Verify compliance with accepted UFP-QAPP and SAP and Seneca LTM Plan. Quality control tests/documentation submitted per the QASP for government review.

3.5.10 Task specific Incentives/Disincentives: Satisfactory or greater CPARS rating/poor CPARS rating and/or re-performance of work at contractor's expense.

3.5.11 Specific Task Requirements:
- Restore all areas to their ***original*** condition; all access/excavation/detonation holes shall be backfilled.

- Hazardous Waste (HW) / Investigative-Derived Waste (IDW) Disposal: The Contractor shall collect, secure, store, and arrange for disposal of hazardous waste, and decontamination wastes, etc. generated as a result of field

activities. The HW/IDW containers shall be staged, secured, labeled, sampled and analyzed (if required) IAW the approved work plan. The Contractor shall recommend appropriate disposal actions for all waste items. The Contractor shall perform the HW disposal in a timely manner.

- The contractor shall propose on the sampling rationale, and methods that will be utilized to ensure that data generated are of an acceptable quality for its intended use. The contractor shall also propose on the quantity, quality and the methods used to verify adherence to the PARCCS parameters for sample collection, handling, laboratory analysis, verification and validation. The contractor shall propose processes that will be utilized to address the corrective actions when established criteria are not being met. Any deviations from the accepted SAP shall be documented in the Daily Quality Control Reports (DQCR) and conveyed to USAESCH personnel immediately.

- Assess the physical condition of each water well.

- Mid-Year Groundwater Monitoring Event:

  Plume Performance Monitoring. The Contractor shall sample and analyze monitoring wells PT-18, MWT-22, PT-22, PT-17, MWT-7, PT-24, MWT-24, MWT-25, MWT-23, MWT-28, MWT-29 and MW-56 as per the protocols and monitoring wells in the approved plan.

  Biowall Process Monitoring. The Contractor shall sample and analyze monitoring wells MWT-7, PT-17, MWT-26, MWT-27, MWT-28, MWT-29 and MWT-23 as per the protocols and monitoring wells in the approved plan.

  Preparation of Groundwater Monitoring Letter Report. Following completion of the mid-year groundwater monitoring, the Contractor shall prepare and submit a letter report which summarizes and analyzes the data collected and observations made. Presentation shall include:
  - o Trend plots of groundwater elevation data for each of the monitoring wells.
  - o Trend plots for all chemical concentration data developed for each of the monitoring wells.
  - o Trend plots of key indicator parameter data developed for each of the monitoring wells.

- End-of-Year Groundwater Monitoring Event:

  Vegetative Cap and Drainage Swale Inspections. The Contractor shall inspect the vegetative soil cover and drainage swales on the site. Inspection shall include observations pertinent to the integrity of the soil and vegetative covering and the condition of run-off channels, infiltration galleries and swales.

  Biowall Trench Condition. The Contractor shall inspect the condition of the Biowall trenches.

  Groundwater Monitoring Well Inspections. The Contractor shall inspect the condition of the groundwater monitoring wells.

  End-of-Year Groundwater Monitoring. The Contractor shall perform the following groundwater monitoring.

  Plume Performance Monitoring. The Contractor shall sample and analyze monitoring wells PT-18, MWT-22, PT-22, PT-17, MWT-7, PT-24, MWT-24, MWT-25 and MW-56 as per the protocols and monitoring wells in the approved plan.

  Biowall Process Monitoring. The Contractor shall sample and analyze monitoring wells MWT-12R, MWT-13, MWT-15, MWT-17R and MWT-23 as per the protocols and monitoring wells in the approved plan.

  Preparation of the Annual Report. Following completion of the annual groundwater monitoring events, the Contractor shall prepare and submit an annual report which summarizes and analyzes the data collected and observations made over the year's effort. Presentation shall include:
  - o Complete tabulations, including maximum and minimum levels, of all groundwater elevation data developed.
  - o Trend plots of groundwater elevation data for each of the monitoring wells.
  - o A potentiometric map of site groundwater.
  - o Complete tabulations of all chemical concentration data developed to date.
  - o Complete tabulations of all indicator parameter data developed to date.

- o Summary presentations (e.g. Sample population, maximums, minimums, median, mean, standard deviation, coefficient of variation, etc) of all chemical concentration data developed to date for down gradient and background wells versus the regulatory criteria values.
- o Trend plots for key chemical concentration data developed for each of the key monitoring wells.
- o Trend plots for all key indicator parameter data developed for each of the key monitoring wells.
- o Recommendations.

- Project Management: The contractor shall manage the delivery order in accordance with the basic contract statement of work. All project management associated with the delivery order, with the exception of the direct technical oversight of the work described in the preceding tasks, shall be accounted for in this task.

3.6 Task 6, (CLIN 0006), DESCRIPTION OF SERVICES FOR BIOWALL RECHARGE OF THE ASH LANDFILL OPERABLE UNIT: This is a firm fixed price task.
Objective: Conduct a RA in accordance with the accepted UFP-QAPP, SAP, Seneca LTM Plan, and all applicable standards such that the objective of this PWS is met. The RA shall include recharging of the biowall that meets FFA requirements.

3.6.1Performance Standard: Field work, quality, and analysis of said data shall meet the following standards:
- QC deliverables and QA inspections/review demonstrate that the work was performed in accordance with the UFP-QAPP, SAP, Seneca LTM Plan, applicable laws, regulations, and guidance documents.

3.6.2 AC: Conduct the RA in accordance with the accepted/approved UFP-QAPP, SAP, and Seneca LTM Plan. QC data submitted meets requirements described in the most recent geophysics and chemistry DIDs.

- No more than 3-4 CARs/948s for non-critical violations and/or 1 CAR/948 for critical violation. No unresolved corrective action requests.
- All final data and QC tests/documentation submitted. Government QA acceptance of QC tests/documentation gained.
- No Class "A" Safety accidents, contractor at fault; No Class "B", contractor at Fault, no more than 1 non-explosive Class "C" accident; and <2 non-explosive related Class "D" accidents, IAW AR 385-40.
- Major safety violations, no more than 1 non-explosive related safety violation.
- Minor safety violations, no more than 2 safety violations.
- Zero letters of reprimand, grievances, or formal complaints

3.6.3 Measurement / Monitoring: Periodic inspection/review of field work. Verify compliance with accepted UFP-QAPP and SAP and Seneca LTM Plan. Quality control tests/documentation submitted per the QASP for government review.

3.6.4 Task specific Incentives/Disincentives: Satisfactory or greater CPARS rating/poor CPARS rating and/or re-performance of work at contractor's expense.

3.6.5 Specific Task Requirements:
- Restore all areas to their ***original*** condition; all access/excavation/detonation holes shall be backfilled.

- Hazardous Waste (HW) / Investigative-Derived Waste (IDW) Disposal: The Contractor shall collect, secure, store, and arrange for disposal of hazardous waste, and decontamination wastes, etc. generated as a result of field activities. The HW/IDW containers shall be staged, secured, labeled, sampled and analyzed (if required) IAW the approved work plan. The Contractor shall recommend appropriate disposal actions for all waste items. The Contractor shall perform the HW disposal in a timely manner.

- The contractor shall propose on the sampling rationale, and methods that will be utilized to ensure that data generated are of an acceptable quality for its intended use. The contractor shall also propose on the quantity, quality and the methods used to verify adherence to the PARCCS parameters for sample collection, handling, laboratory analysis, verification and validation. The contractor shall propose processes that will be utilized to address the

Engineering Estimate for Light Grubbing per Job Order Contract 1 August 2018

Background: The Job Order Contract is a price list based, contract with technical specifications (Gordian/RL Means). The supporting documentation shows an 11 July 2018 contract (W912DS18F0085, awarded 11 July 2018), with excerpts from a clearing and grubbing scope that shows a comparable contract for two acres of heavy grubbing. The unit rates in this contract were based upon the prior price list at award, and vary also for heavier grubbing and labor hours are different.

Light grubbing is required for annual maintenance. The May 2018 price book cover sheet and contract line items for the appropriate categories of work effort used below, that are needed and these line items are enclosed as supporting documentation.

The overhead factor is the contractor's overhead that is annually adjusted for inflation for option years in the contract.

The Codes, Unit Activity, Unit prices below are from the May 2018 price book and the overhead factor is the current (FY 18) overhead factor used in the Job Order Contract # W912DS-13-D-0005, FY18 Option Year 3.

20 hours is the estimated labor for the equipment operator time that is needed.

Equipment delivery is 2 hours to include return transportation of the equipment from the site. This is a mobilization and demobilization cost.

The unit cost for light grubbing is used versus heavy grubbing in the contract enclosed.

Code	Unit Activity	Quantity	Unit Price	Overhead factor	Amount
01 22 20 00-0015	Labor	20	$64.75	1.409	$1,824.66
01 71 13 00-0002	Equipment Delivery	2	$212.55	1.409	$ 425.10
31 11 00 00-0003	Clear and Grub light	1	$1473.63	1.409	$2,076.34

Total clear and Grub light grubbing for 1 acre = $4,326.10

Prepared By/Date: BATTAGLIA.RANDALL.W.1228816724

Digitally signed by BATTAGLIA.RANDALL.W.1228816724
DN: c=US, o=U.S. Government, ou=DoD, ou=PKI, ou=USA, cn=BATTAGLIA.RANDALL.W.1228816724
Date: 2018.08.01 12:59:23 -04'00'

MINOR CSI	UOM	DESCRIPTION	TOTAL DIRECT UNIT COST	DEMOLITION UNIT COST
01 22 20 00-0014	HR	Glazier	57.12	
		Note: For tasks not included in the Construction Task Catalog® and as directed by owner only.		
		For Foreman, Add	*2.86*	
		For Apprentice, Deduct	*-11.42*	
01 22 20 00-0015	HR	Laborer	64.75	
		Note: For tasks not included in the Construction Task Catalog® and as directed by owner only.		
01 22 20 00-0016	HR	Lather	70.64	
		Note: For tasks not included in the Construction Task Catalog® and as directed by owner only.		
		For Foreman, Add	*3.53*	
		For Apprentice, Deduct	*-14.13*	
01 22 20 00-0017	HR	Marble Setter	72.85	
		Note: For tasks not included in the Construction Task Catalog® and as directed by owner only.		
		For Foreman, Add	*3.64*	
		For Apprentice, Deduct	*-14.57*	
01 22 20 00-0018	HR	Millwright	67.94	
		Note: For tasks not included in the Construction Task Catalog® and as directed by owner only.		
		For Foreman, Add	*3.40*	
		For Apprentice, Deduct	*-13.59*	
01 22 20 00-0019	HR	Painter, Ordinary	60.44	
		Note: For tasks not included in the Construction Task Catalog® and as directed by owner only.		
		For Foreman, Add	*3.02*	
		For Apprentice, Deduct	*-12.09*	
01 22 20 00-0020	HR	Painter, Structural Steel	69.06	
		Note: For tasks not included in the Construction Task Catalog® and as directed by owner only.		
		For Foreman, Add	*3.45*	
		For Apprentice, Deduct	*-13.81*	
01 22 20 00-0021	HR	Paperhanger	60.44	
		Note: For tasks not included in the Construction Task Catalog® and as directed by owner only.		
		For Foreman, Add	*3.02*	
		For Apprentice, Deduct	*-12.09*	
01 22 20 00-0022	HR	Pile Drivers	79.26	
		Note: For tasks not included in the Construction Task Catalog® and as directed by owner only.		
		For Foreman, Add	*3.96*	
		For Apprentice, Deduct	*-15.85*	
01 22 20 00-0023	HR	Plasterer	59.05	
		Note: For tasks not included in the Construction Task Catalog® and as directed by owner only.		
		For Foreman, Add	*2.95*	
		For Apprentice, Deduct	*-11.81*	
01 22 20 00-0024	HR	Plumber	70.83	
		Note: For tasks not included in the Construction Task Catalog® and as directed by owner only.		
		For Foreman, Add	*3.54*	
		For Apprentice, Deduct	*-14.17*	
01 22 20 00-0025	HR	Powderman	67.59	
		Note: For tasks not included in the Construction Task Catalog® and as directed by owner only.		
		For Foreman, Add	*3.38*	
		For Apprentice, Deduct	*-13.52*	
01 22 20 00-0026	HR	Rodman (Reinforcing)/Ornamental Steel Worker	72.24	
		Note: For tasks not included in the Construction Task Catalog® and as directed by owner only.		
		For Foreman, Add	*3.61*	
		For Apprentice, Deduct	*-14.45*	
01 22 20 00-0027	HR	Roofer, Composite	66.89	
		Note: For tasks not included in the Construction Task Catalog® and as directed by owner only.		
		For Foreman, Add	*3.34*	
		For Apprentice, Deduct	*-13.38*	
01 22 20 00-0028	HR	Roofer, Tile/Slate	67.12	
		Note: For tasks not included in the Construction Task Catalog® and as directed by owner only.		
		For Foreman, Add	*3.36*	
		For Apprentice, Deduct	*-13.42*	
01 22 20 00-0029	HR	Sheet Metal Worker	71.16	
		Note: For tasks not included in the Construction Task Catalog® and as directed by owner only.		
		For Foreman, Add	*3.56*	
		For Apprentice, Deduct	*-14.23*	
01 22 20 00-0030	HR	Sprinkler Installer	68.55	
		Note: For tasks not included in the Construction Task Catalog® and as directed by owner only.		
		For Foreman, Add	*3.43*	
		For Apprentice, Deduct	*-13.71*	
01 22 20 00-0031	HR	Steam / Pipe Fitter	70.83	
		Note: For tasks not included in the Construction Task Catalog® and as directed by owner only.		
		For Foreman, Add	*3.54*	
		For Apprentice, Deduct	*-14.17*	
01 22 20 00-0032	HR	Stone Mason	73.18	
		Note: For tasks not included in the Construction Task Catalog® and as directed by owner only.		
		For Foreman, Add	*3.66*	
		For Apprentice, Deduct	*-14.64*	
01 22 20 00-0033	HR	Structural Steel Worker	76.06	
		Note: For tasks not included in the Construction Task Catalog® and as directed by owner only.		
		For Foreman, Add	*3.80*	
		For Apprentice, Deduct	*-15.21*	
01 22 20 00-0034	HR	Tile Layer	67.90	
		Note: For tasks not included in the Construction Task Catalog® and as directed by owner only.		
		For Foreman, Add	*3.40*	
		For Apprentice, Deduct	*-13.58*	
01 22 20 00-0035	HR	Terrazzo Worker	67.90	
		Note: For tasks not included in the Construction Task Catalog® and as directed by owner only.		
		For Foreman, Add	*3.40*	
		For Apprentice, Deduct	*-13.58*	

MINOR CSI	UOM	DESCRIPTION	TOTAL DIRECT UNIT COST	DEMOLITION UNIT COST
01 58 13 00-0020	EA	>16 To 24 SF, Full Color Design, Non Reflectorized, MDO Plywood Sign	197.91	19.53
01 58 13 00-0021	EA	>24 To 32 SF, Full Color Design, Non Reflectorized, MDO Plywood Sign	229.69	20.34
01 58 13 00-0022	SF	>32 SF, Full Color Design, Non Reflectorized, MDO Plywood Sign	7.21	0.65
01 58 13 00-0023		Fabricate And Install New Posts *(01 58 13 00-0001)*		
		Note: Includes excavation, backfill and compaction. Excludes core drilling.		
01 58 13 00-0024	LF	Galvanized Metal Channel Sign Posts	9.56	
01 58 13 00-0025	LF	4" x 4" Pressure Treated Wood Sign Posts	7.98	
01 58 13 00-0026	LF	4" x 6" Pressure Treated Wood Sign Posts	9.53	
01 58 13 00-0027		Owner Supplied Signs *(01 58 13 00-0001)*		
01 58 13 00-0028	EA	Installation And Removal Of Owner Supplied Project Sign	65.07	

01 60 Product Requirements *(01)*

01 66 Product Storage And Handling Requirements *(01 60)*

01 66 19 Material Handling *(01 66)*

Note: Not for use in conjunction with other tasks when the distance is less than 2 stories with attic (2-1/2 stories) or less than 125'.

01 66 19 00-0001		Material Handling Between Floors *(01 66 19)*		
01 66 19 00-0002	CY	Transfer Delivered Material Between Floors Via Stairs, Per Floor Note: Quantity equals volume of materials multiplied by number of floors traveled.	12.51	
01 66 19 00-0003	CY	Transfer Delivered Material Between Floors Via Elevator, Per Trip Note: Quantity is not multiplied by number of floors traveled. Includes transfer of materials between elevators, if more than one bank of elevators is required.	8.14	
01 66 19 00-0004		Moving Furniture *(01 66 19)* Note: To be used when contractor is required to move furniture. Not to be used when the amount of furniture is less than 55% of the total floor space. Moving of furniture which occupies less than 55% of the total floor space is considered as part of the coefficient adjustment factor.		
01 66 19 00-0005	SF	Removal, Transport, Return And Reinstallation Of Office Furniture Note: Includes general, desks, tables, file cabinets (full), chairs, storage boxes, bookshelves, office equipment and computers (per SF of office area). Not to be used when amount of furniture is less than 55% of total floor space.	0.81	
01 66 19 00-0006		Material Handling For Distances Greater Than 125' *(01 66 19)*		
01 66 19 00-0007	CY	Transfer Delivered Materials Distances Greater Than 125', Per CY Of Material Per 125' Note: For delivery, demolition or miscellaneous moving required by owner.	11.85	
01 66 19 00-0008		Rubbish Handling Between Floors *(01 66 19)* Note: Only use with selective demolition tasks to transfer demolished material more than 2-1/2 stories.		
01 66 19 00-0009	CY	Rubbish Handling Via Stairs, Per CY Of Material Per Floor Note: Quantity equals material volume times bulk factor times number of floors traveled.	16.11	
01 66 19 00-0010	CY	Rubbish Handling Via Elevator, Per CY Of Material Note: Quantity equals material volume times bulk factor. If more than one elevator is used, the quantity is factored by the number of transfers.	9.65	

01 70 Execution And Closeout Requirements *(01)*

01 71 Examination And Preparation *(01 70)*

01 71 13 Mobilization *(01 71)*

01 71 13 00-0001		Equipment Delivery, Pickup, Mobilization And Demobilization *(01 71 13)* Note: Excludes flagman for traffic control where necessary.		
01 71 13 00-0002	EA	Equipment Delivery, Pickup, Mobilization And Demobilization Using A Rollback Flatbed Truck Note: Includes delivery of equipment, off loading on site, rigging, dismantling, loading and transporting away. For equipment such as trenchers, skid-steer loaders (bobcats), industrial warehouse forklifts, sweepers, scissor platform lifts, telescoping and articulating boom manlifts with up to 40' boom lengths, etc.	212.55	
01 71 13 00-0003	EA	Equipment Delivery, Pickup, Mobilization And Demobilization Using A Tractor Trailer With Up To 53' Bed Note: Includes delivery of equipment, off loading on site, rigging, dismantling, loading and transporting away. For equipment such as bulldozers, motor scrapers, hydraulic excavators, gradalls, road graders, loader-backhoes, heavy duty construction loaders, tractors, pavers, rollers, bridge finishers, straight mast construction forklifts, telescoping boom rough terrain construction forklifts, telescoping and articulating boom manlifts with >40' boom lengths, etc.	555.07	
01 71 13 00-0004		Crane Delivery, Pickup, Mobilization And Demobilization *(01 71 13)* Note: Includes delivery of equipment, off loading on site and ngging. Return includes dismantling, loading and transporting away. Excludes flagman for traffic control where necessary.		
01 71 13 00-0005	EA	Up To 20 Ton Lift Move On/Off Cost, Hydraulic Crane Note: Includes delivery and pickup.	340.07	
		For >30 To 60 Miles Radius, Add	*85.02*	
		For >60 To 100 Miles Radius, Add	*136.03*	

MINOR CSI	UOM	DESCRIPTION	TOTAL DIRECT UNIT COST	DEMOLITION UNIT COST
31 05 16 00-0010	CY	#7 Stone Aggregate Fill (1/2" To #4)	38.10	
		For Up To 10, Add	*10.87*	
		For >10 To 25, Add	*3.81*	
31 05 16 00-0011	CY	#78 Stone Aggregate Fill (#8 To 1/2")	39.20	
		For Up To 10, Add	*11.20*	
		For >10 To 25, Add	*3.92*	
31 05 16 00-0012	CY	#8 Stone Aggregate Fill (3/8" x 1/8")	40.29	
		For Up To 10, Add	*11.53*	
		For >10 To 25, Add	*4.03*	
31 05 16 00-0013	CY	#89 Stone Aggregate Fill (#16 To 3/8")	40.46	
		For Up To 10, Add	*11.58*	
		For >10 To 25, Add	*4.05*	
31 05 16 00-0014	CY	#9 Stone Aggregate Fill (1/4" Clean)	40.64	
		For Up To 10, Add	*11.63*	
		For >10 To 25, Add	*4.06*	
31 05 16 00-0015	CY	#10 Stone Aggregate Fill (#8 To 3/4)	42.31	
		For Up To 10, Add	*12.13*	
		For >10 To 25, Add	*4.23*	
31 05 16 00-0016	CY	#610 Modified Stone Aggregate Fill (#16 To 3/4")	38.97	
		For Up To 10, Add	*11.13*	
		For >10 To 25, Add	*3.90*	
31 05 16 00-0017	CY	Screenings Stone Aggregate Fill	30.84	
		For Up To 10, Add	*8.69*	
		For >10 To 25, Add	*3.08*	
31 05 16 00-0018	CY	Stone Aggregate Fill, Random Size, Over 6" To 12"	27.01	
		For Up To 10, Add	*7.54*	
		For >10 To 25, Add	*2.70*	
31 05 16 00-0019	CY	Graded Stone Aggregate Fill, Over 6" To 12"	29.38	
		For Up To 10, Add	*8.25*	
		For >10 To 25, Add	*2.94*	
31 05 16 00-0020	CY	Surge Stone Aggregate Fill (3" To 7" Random)	37.92	
		For Up To 10, Add	*10.81*	
		For >10 To 25, Add	*3.79*	
31 05 16 00-0021	CY	Surge Stone Graded Aggregate Fill (3" To 7")	44.28	
		For Up To 10, Add	*12.72*	
		For >10 To 25, Add	*4.43*	
31 05 16 00-0022	CY	Crusher Run Aggregate Fill (2-1/2" Minus)	36.13	
		For Up To 10, Add	*10.28*	
		For >10 To 25, Add	*3.61*	
31 05 16 00-0023	CY	Crusher Run Aggregate Fill (1-1/2" Minus)	35.04	
		For Up To 10, Add	*9.95*	
		For >10 To 25, Add	*3.50*	
31 05 16 00-0024	CY	Crusher Run Aggregate Fill (3/4" Minus)	31.31	
		For Up To 10, Add	*8.83*	
		For >10 To 25, Add	*3.13*	

31 05 36 Equipment Delivery, Pickup, Mobilization And Demobilization (31 05)

See CSI section 01 71 13 00-0001 for equipment delivery, pickup, mobilization and demobilization.

31 10 Site Clearing (31)

31 11 Clearing And Grubbing (31 10)

31 11 00 00-0001 Clear And Grub Roots And Stumps (31 11)

Note: Tree diameter (diameter at breast height) is the diameter of the tree trunk measured at 4.5' above ground level. Based on tree density (light, medium or heavy) to be removed. Excludes loading.

31 11 00 00-0002	ACR	Clear And Grub Light Trees Up To 6" Diameter, Cut And Chip	6,039.71
		Note: Includes grub and removal of stump	
31 11 00 00-0003	ACR	Clear And Grub Light Stumps Only Up To 6" Diameter	1,473.63
31 11 00 00-0004	ACR	Clear And Grub Medium Trees Up To 10" Diameter, Cut And Chip	7,046.33
		Note: Includes grub and removal of stump	
31 11 00 00-0005	ACR	Clear And Grub Medium Stumps Only Up To 10" Diameter	2,456.06
31 11 00 00-0006	ACR	Clear And Grub Heavy Trees Up To 16" Diameter, Cut And Chip	8,007.19
		Note: Includes grub and removal of stump	
31 11 00 00-0007	ACR	Clear And Grub Heavy Stumps Only Up To 16" Diameter	2,791.31
31 11 00 00-0008	ACR	Clearing By Machine - Light Brush Without Grub	230.13
31 11 00 00-0009	ACR	Clearing By Machine - Medium Brush Without Grub	473.13
31 11 00 00-0010	ACR	Clearing By Machine - Heavy Brush Without Grub	672.22
31 11 00 00-0011	ACR	Chipping - Light Brush	1,879.36
31 11 00 00-0012	ACR	Chipping - Medium Brush	2,416.43
31 11 00 00-0013	ACR	Chipping - Heavy Brush	3,383.32

31 11 00 00-0014 Loading Of Cleared And Grubbed Material (31 11)

31 11 00 00-0015	CY	Machine Loading Of Cleared And Grubbed Material	8.02
31 11 00 00-0016	CY	Chute Loading Of Cleared And Grubbed Material	9.62
31 11 00 00-0017	CY	Hand Loading Of Cleared And Grubbed Material	29.58
31 11 00 00-0018	CY	Wheel And Ramp Loading Of Cleared And Grubbed Material	23.23

31 13 Selective Tree And Shrub Removal And Trimming (31 10)