

RFQ: DEP14706
August 12, 2009

Expression of Interest (EOI)
For the Site Characterization Study, Leachate Management and
Closure Cap Design for the City of Clarksburg Landfill



Prepared by:

Tetra Tech
Foster Plaza 7
661 Andersen Drive
Pittsburgh, PA 15220

Point of Contact & Telephone Number:

Mr. Mark Speranza, PE
T: 412.921.7090
F: 412.921.4040
email: mark.speranza@tetrattech.com

Prepared for:

State of West Virginia
Department of Administration
Purchasing Division
2019 Washington Street East
Post Office Box 50130
Charleston, WV 25305-0130

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PURCHASING DIVISION
STATE OF WV





TETRA TECH

August 11, 2009

State of West Virginia
Purchasing Division
2019 Washington Street, East
P.O. Box 50130
Charleston, West Virginia 25305-0130

Subject: RFQ# DEP14706—City of Clarksburg Landfill Closure Project

Dear Committee:

Tetra Tech is pleased to submit our proposal to perform landfill closure design services in reply to RFQ# DEP14706 for the State of West Virginia. As outlined in Attachment 1, our relevant project experience includes work on over 60 similar recent projects. These projects have included services that will be needed for this project such as site investigations, surveying, landfill closure and leachate management design, and construction services. As part of our extensive work with the Environmental Protection Agency (EPA), Tetra Tech performs direct oversight for the EPA on remediation projects.

While this project will be managed out of Tetra Tech's Pittsburgh office, our firm will also rely on our office location in Charleston, West Virginia to provide support. That office's largest client is the West Virginia Department of Environmental Protection. Tetra Tech welcomes the opportunity to perform work in West Virginia as we continue to develop our Charleston location.

Tetra Tech is joined on this project by Triad Engineering, which will provide drilling and surveying services. Our firms have previously worked together and Triad is located in Morgantown, West Virginia.

Our experienced team is led by Mr. Robert Mertz, PE. Mr. Mertz is a licensed Professional Engineer in the State of West Virginia and has extensive experience with landfill closures, landfill leachate collection and removal systems, and remedial design of municipal, industrial, and hazardous waste landfills. Mr. Mertz has personally prepared the designs for several caps including composite caps, single barrier caps consisting of a geomembrane or low permeability clay, soil covers, and soil covers coupled with phytoremediation. Our team's key personnel have over 125 years of combined landfill experience.

As requested by the RFP we have provided one original copy of our submittal along with two copies on CD. We appreciate the opportunity to provide this proposal, and look forward to answering any questions you may have.

If you require any additional information, please feel free to contact us at (412) 921-7090.

Very truly yours,

Mr. Mark Speranza, PE
Pittsburgh Operations Manager

Enclosures



State of West Virginia
 Department of Administration
 Purchasing Division
 2019 Washington Street East
 Post Office Box 50130
 Charleston, WV 25305-0130

Request for Quotation

RFQ NUMBER
DEP14706

PAGE
1

ADDRESS CORRESPONDENCE TO ATTENTION OF
CHUCK BOWMAN
304-558-2157

RFQ COPY
TYPE NAME/ADDRESS HERE

VENDOR

Tetra Tech NUS, Inc.
 661 Andersen Drive
 Pittsburgh, PA 15220

SHIP TO

ENVIRONMENTAL PROTECTION
DEPARTMENT OF
OFFICE OF WASTE MANAGEMENT
601 57TH STREET SE
CHARLESTON, WV
25304 **304-926-0499**

DATE PRINTED	TERMS OF SALE	SHIP VIA	FOB	FREIGHT TERMS
07/23/2009				

BID OPENING DATE: **08/12/2009** BID OPENING TIME **01:30PM**

LINE	QUANTITY	UOP	CAT NO	ITEM NUMBER	UNIT PRICE	AMOUNT
0001	1	JB		962-73	NA	NA
<p>CITY OF KINGWOOD LANDFILL CLOSURE PROJECT</p> <p>CITY OF CLARKSBURG LANDFILL CLOSURE PROJECT</p> <p>EXPRESSION OF INTEREST</p> <p>THE WEST VIRGINIA PURCHASING DIVISION, FOR THE AGENCY, THE WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION, IS SOLICITING EXPRESSIONS OF INTEREST FOR THE SITE CHARACTERIZATION STUDY, LEACHATE MANAGEMENT AND CLOSURE CAP DESIGN FOR THE CITY OF CLARKSBURG LANDFILL, LOCATED IN HARRISON CO, WV, PER THE FOLLOWING BID REQUIREMENTS AND ATTACHED SPECIFICATIONS.</p> <p>BANKRUPTCY: IN THE EVENT THE VENDOR/CONTRACTOR FILES FOR BANKRUPTCY PROTECTION, THE STATE MAY DEEM THIS CONTRACT NULL AND VOID, AND TERMINATE SUCH CONTRACT WITHOUT FURTHER ORDER.</p>						

SEE REVERSE SIDE FOR TERMS AND CONDITIONS

SIGNATURE <i>Mark Speranza</i> (for Mark Speranza)	TELEPHONE 412-921-8916	DATE August 10, 2009
TITLE Pittsburgh Operations Manager	FEIN 95-4660169	ADDRESS CHANGES TO BE NOTED ABOVE

WHEN RESPONDING TO RFQ, INSERT NAME AND ADDRESS IN SPACE ABOVE LABELED 'VENDOR'

**WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION
LANDFILL CLOSURE CONSULTANT QUALIFICATION QUESTIONNAIRE**

PROJECT NAME City of Clarksburg Landfill Closure Project		DATE (DAY, MONTH, YEAR) 12, August, 2009	FEIN 95-4660169
1. FIRM NAME Tetra Tech NUS, Inc.	2. HOME OFFICE BUSINESS ADDRESS Foster Plaza 7, 661 Andersen Drive Pittsburgh, Pennsylvania 15220		3. FORMER FIRM NAME NA
4. HOME OFFICE TELEPHONE (412) 921-7090	5. ESTABLISHED (YEAR) 1960	6. TYPE OWNERSHIP INDIVIDUAL, CORPORATION, PARTNERSHIP, JOINT- VENTURE Corporation	6A. WV REGISTERED DBE (DISAVANTAGED BUSINESS ENTERPRISE) No
7. PRIMARY OFFICE: ADDRESS/ TELEPHONE/ PERSON IN CHARGE/ NO. (name particular type) PERSONNEL EACH OFFICE Foster Plaza 7, 661 Andersen Drive, Pittsburgh, PA 15220 / (412) 921-7090 / Mr. Mark Speranza, PE / 186			
8. NAMES OF PRINCIPAL OFFICERS OR MEMBERS OF FIRM Mr. Mark Perry, PE—Regional Manager Mr. Steve Giannino, PE—Regional Manager Mr. John Trepanowski, PE—Regional Manager		8a. NAME, TITLE, & TELEPHONE NUMBER-OTHER PRINCIPALS Mr. Mark Speranza, PE—Pittsburgh Office Manager	
9. NUMBER OF PERSONNEL BY DISPLINE (Bold Lettering Indicates Minimum Design Team Members) Detailed information On Team To Be Included			
<u>46</u> ADMINISTRATIVE — ARCHITECTS <u>1</u> BIOLOGIST <u>4</u> CADD OPERATORS <u>13</u> CHEMICAL ENGINEERS <u>33</u> CIVIL ENGINEERS <u>2</u> CONSTRUCTION INSPECTORS <u>4</u> DESIGNERS — DRAFTSMEN	<u>2</u> ECOLOGISTS ECONOMISTS <u>1</u> ELECTRICAL ENGINEERS <u>17</u> ENVIRONMENTALISTS <u>1</u> ESTIMATORS <u>14</u> GEOLOGIST — HISTORIANS <u>4</u> HYDROLOGISTS	— LANDSCAPE — ARCHITECTS <u>3</u> MECHANICAL ENGINEERS <u>2</u> MINING ENGINEERS — PHOTOGRAMMETRISTS — PLANNERS: — URBAN/REGIONAL — SANITARY — ENGINEERS <u>2</u> SOILS ENGINEERS <u>2</u> SPECIFICATION WRITERS	— STRUCTURAL — ENGINEERS * SURVEYORS (Handled by Triad) <u>40</u> OTHER <u>191</u> TOTAL PERSONNEL
TOTAL NUMBER OF WV REGISTERED PROFESSIONAL ENGINEERS IN PRIMARY OFFICE: <u>4</u>			
*RPEs other than Civil must provide supporting documentation that qualifies them to supervise and perform this type of work.			
10. If submittal is by joint venture, list participating firms & outline specific areas of responsibility (including administrative, technical, & financial) for each firm. Each participating firm must complete a "Consultant Confidential Qualification Questionnaire".			
10a. HAS THIS JOINT-VENTURE WORKED TOGETHER BEFORE? <input type="checkbox"/> YES <input type="checkbox"/> NO			

11. OUTSIDE KEY CONSULTANTS/ SUB-CONSULTANTS ANTICIPATED TO BE USED.		
Name and Address	Specialty	Work with Before
Triad Engineering 219 Hartman Run Rd Morgantown, WV 26505	Drilling/Surveying	YES
Geotechnics 544 Braddock Avenue Pittsburgh, PA 15112	Geotechnical Laboratory	Team members have previously worked with them while with other firms
Severn Trent Services 1746 Irwin Sportsman Rd. Manor, PA 15665	Analytical Laboratory	YES
Keddal Aerial Mapping 1121 Boyce Rd, Ste. 3100 Pittsburgh, PA 15241	Aerial Mapping	Team members have previously worked with them while with other firms

12. ***Note: Personnel refers to those who will be working directly on the project:

A. Are your firm's personnel experienced in Solid Waste Landfill Closure Design?

YES Description and Number of Projects:

Tetra Tech personnel have been involved in a wide variety of landfills closure projects. Landfill experience is identified by project, staff member, and task on Attachment 1, which identifies **over 50 landfills** (many of which have included site characterizations and leachate management) at which design work was performed for landfill closure. Landfill closure designs have included soil caps, geomembrane caps, evapotranspiration covers, explosion-resistant caps, paved cap areas, phytoremediation, waste consolidation to reduce landfilled area, selective waste removal, groundwater extraction, replacement of wetlands, upgrading of leachate treatment facilities, and cut-off walls. Each Tetra Tech closure design was developed to address site specific needs and regulatory requirements with the best value solution.

NO

B. Are your firm's personnel experienced in Solid Waste landfill site characterization assessment and evaluation?

YES Description and Number of Projects:

Tetra Tech has performed environmental site investigations at **over one hundred landfill sites** throughout the country. Site evaluations have included development of planning documents to collect data; sampling soil, sediment, groundwater, leachate, landfill gas, and LNAPL; evaluation of data; interpretation of the nature and extent of the contamination; ecological and human health risk evaluation (including vapor intrusion) for contaminated media; and implementation of remedial actions necessary to address contaminated soil, sediment, surface water, and groundwater. Evaluation also includes, as necessary, modeling of contaminant fate and transport from the source area to receptor locations and the development of remedial goal options. Biologists often contribute as necessary and required to perform screening level ecological risk assessments (SLERAs), full scale baseline ecological risk assessments (BERAs) and other biological assessments. Geologists often perform media sampling, design and installation of compliance monitoring groundwater networks, and evaluations of contaminant transport through in-depth aquifer characterizations and analyses of various groundwater flow models.

Tetra Tech employs biologists, chemists, field sampling personnel, civil and chemical engineers, geologists and hydrogeologists, risk assessors, and numerous other personnel to scope and perform site investigations, evaluations, and remedial actions. Attachment 1 identifies **over 20 landfills** at which site investigations were performed by Tetra Tech. This attachment also identifies sites where laboratory analyses of soil and water, as well as subsurface investigations to determine the limit of waste, were performed.

NO

C. Are your firm's personnel experienced in landfill closure construction inspection?

YES Description and Number of Projects:

Chris Neumann, Tetra Tech's Construction Manager, has experience with landfill closure construction inspection and will manage this aspect of the project. In addition, team members Bob Mertz, PE, Nina Balsamo, PE, Dan Witt, PE, and Ralph Boedeker, PE, also routinely provide technical review of construction submittals and variance requests in conjunction with landfill closure projects. In addition to Mr. Strassner, who will perform QA/QC services, Mr. Mertz and Mr. Boedeker have also performed landfill cap QA/QC field inspection and will assist in this task. Attachment 1 identifies **over 20 landfill** closures at which QA/QC following design approval was performed.

NO

D. Is your firm experienced in Aerial Photography and the Development of Contour Mapping?

YES Description and Number of Projects:

Tetra Tech routinely hires subcontractors for aerial photography to develop contour maps. In most cases the contour mapping was developed through aerial photography and ground truthing but on some projects land surveyors were used for mapping. Tetra tech employs six GIS/CADD operators in the Pittsburgh office and has all necessary GIS/CADD software for map development. Attachment 1 identifies over 15 landfills at which mapping was developed.

NO

E. Are your firm's personnel experienced in evaluating ground water contamination, such as may be associated with landfills?

YES Description and Number of Projects:

Tetra Tech has performed hundreds of environmental site investigations and has evaluated groundwater contamination at approximately 90% of these sites. Tetra Tech employs chemists who routinely perform validation of groundwater data. Tetra Tech has also performed hydrogeologic modeling, as appropriate, for site evaluation and closure design. In addition, team member William Randall, LRS, PG, has performed hydrogeologic evaluations of groundwater monitoring systems for a portfolio of WVDEP LCAP landfills in West Virginia including the following locations: Clarksburg, Don's Disposal, Fayette Co., Mingo Co., Monongalia Co., Montgomery City, Pine Creek, and South Charleston landfills.

NO

F. Are your firm's personnel experienced in Landfill Closure cost estimating?

YES Description and Number of Projects:

Tetra Tech has performed conceptual design cost estimates including capital costs, operation and maintenance costs, and present worth analyses, for over 50 landfill closure projects to assist in determining the best-value solution. In addition, detailed cost estimates are prepared to serve as the owners engineer's estimate based on the final landfill closure design.

NO

13. Personal History Statement of Principals and Associates RESPONSIBLE FOR LANDFILL CLOSURE DESIGN (describe project) (Furnish Complete data but keep to essentials)			
NAME & TITLE (Last, first, Middle Int.)	YEARS OR EXPERIENCE		
	YEARS OF ENGINEERING EXPERIENCE:	YEARS OF LANDFILL CLOSURE EXPERIENCE:	YEARS OF LANDFILL CONSTRUCTION MONITORING EXPERIENCE:
Mertz, Robert C., PE Project Manager	22	16	5
Brief Explanation of Responsibilities:			
Mr. Mertz has extensive experience with landfill leachate collection and removal systems, landfill closure, and remedial design of municipal, industrial, and hazardous waste landfills. He has worked on more than 30 landfill projects and his related projects include closure designs for the Small Landfill, Former Naval Air Station South Weymouth, and Heavy Equipment Training Area and Golf Course Landfills, both located in Gulfport, MS. Mr. Mertz has personally prepared the designs for several caps including composite caps (RCRA Subtitle C), single barrier caps consisting of a geomembrane or low permeability clay, soil covers (RCRA Subtitle D), and soil covers coupled with phytoremediation.			
EDUCATION (DEGREE, YEAR, SPECIALIZATION)			
ME, 1991, Civil Engineering (Structural Emphasis), Penn State University BS, 1983, Civil Engineering (Geotechnical Emphasis), Penn State University			
MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS:		REGISTRATION (Type, Year, State)	
American Society of Civil Engineers (ASCE), Member		Professional Engineer, 1997, WV Professional Engineer, 1990, PA Professional Engineer, 1997, OH	
13a. Personal History Statement of Principals and Associates RESPONSIBLE FOR LANDFILL CLOSURE DESIGN (name type of design or work) (Furnish complete data but keep to essentials)			
NAME & TITLE (Last, First, Middle Int.)	YEARS OF EXPERIENCE		
	YEARS OF GEOLOGY EXPERIENCE:		
Randall, Bill, PG, LRS Deputy Project Manager	23		
Brief Explanation of Responsibilities:			
Mr. Randall is a Sr. Hydrogeologist/Geophysicist with Tetra Tech and has extensive landfill project experience including geophysical delineation, preparation and analysis of groundwater monitoring networks, remediation via removal, oversight of grading and capping systems, and long term monitoring plans. He worked on the WVDEP LCAP program providing hydrogeologic evaluation of groundwater monitoring systems for nine West Virginia landfills (Clarksburg, Don's Disposal, Fayette Co., Mingo Co., Monongalia Co., Montgomery City, Pine Creek, and South Charleston).			
EDUCATION (Degree, Year, Specialization)			
MS, 1988, Geology, Wright State University BS, 1983, Geology, Northeastern University			
MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS		REGISTRATION (Type, Year, State)	
N/A		Licensed Remediation Specialist #207, 2007, WV Professional Geologist, 1994, PA Professional Geologist, 1991, TN Professional Geologist, 1997, WI	

13a. Personal History Statement of Principals and Associates RESPONSIBLE FOR LANDFILL CLOSURE DESIGN (name type of design or work) (Furnish complete data but keep to essentials)			
NAME & TITLE (Last, First, Middle Int.)	YEARS OF EXPERIENCE		
	YEARS OF ENGINEERING EXPERIENCE:	YEARS OF LANDFILL EXPERIENCE	
Boedeker, Ralph H., PE Technical Advisor	26	19	
Brief Explanation of Responsibilities:			
Mr. Boedeker has worked on more than 15 landfill projects and is experienced in all aspects of landfill characterization including performing topographic surveys, landfill limit delineation, geotechnical and hydrogeologic field investigations, and off-site methane gas migration studies. His landfill closure design experience includes the Kim-Stan Landfill Site; East Zion Landfill Superfund Site; Healthways Site; Gardena Valley Landfills; Vandenberg AFB and McConnell AFB. He also provided QA/QC, oversight during closure construction, and 5-year reviews on several landfill closure projects and projects including; The WV Ordnance Works Superfund Site in Point Peasant, WV and others.			
EDUCATION (Degree, Year, Specialization)			
ME, 1988, Civil Engineering (Geotechnical Emphasis), University of Delaware BS, 1982, Construction Engineering, Iowa State University			
MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS		REGISTRATION (Type, Year, State)	
N/A		Professional Engineer, 1989, DE Professional Engineer, 2001, MD Professional Engineer, 2001, PA Professional Engineer, 2001, VA	
13a. Personal History Statement of Principals and Associates RESPONSIBLE FOR LANDFILL CLOSURE DESIGN (name type of design or work) (Furnish complete data but keep to essentials)			
NAME & TITLE (Last, First, Middle Int.)	YEARS OF EXPERIENCE		
	YEARS OF ENGINEERING EXPERIENCE:	YEARS OF ENVIRONMENTAL EXPERIENCE:	YEARS OF LANDFILL EXPERIENCE:
Balsamo, Nina J., PE Project Engineer	23	13	9
Brief Explanation of Responsibilities:			
Ms. Balsamo is an engineer with over 23 years of experience and has worked on more than 20 landfill projects . Her landfill project experience includes design and other activities for the Apple Orchard Landfill and she has also coordinated landfill expansion designs, including geotechnical and geologic subsurface investigation, laboratory testing, landfill liner and leachate collection layers, evaluation of capping alternatives, sedimentation/leachate collection pond upgrades, and permitting. She has performed hydrologic analyses to determine the quantity of leachate generated during each stage of landfill construction. Ms. Balsamo also performed cap design calculations for several landfills closures.			
EDUCATION (Degree, Year, Specialization)			
MS, 1987, Civil Engineering, University of Pittsburgh BS, 1979, Civil Engineering, University of Pittsburgh			
MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS		REGISTRATION (Type, Year, State)	
N/A		Professional Engineer, 1984, PA NCEES, 2006	

13a. Personal History Statement of Principals and Associates RESPONSIBLE FOR LANDFILL CLOSURE DESIGN (name type of design or work) (Furnish complete data but keep to essentials)			
NAME & TITLE (Last, First, Middle Int.)	YEARS OF EXPERIENCE		
	YEARS OF ENGINEERING EXPERIENCE:	YEARS OF LANDFILL EXPERIENCE:	
Smith, Timothy S., PE Project Engineer	15	15	
Brief Explanation of Responsibilities:			
Mr. Smith has worked on more than 15 landfill projects and his pre-design responsibilities have included landfill delineation and the determination of flood plains, wetlands, and data needs for landfill closure design. During the design phase, Mr. Smith's responsibilities have included review of regulations, development of appropriate cap profiles, grading, preparation of erosion and sediment control plans and storm water pollution prevention plans, surface and subsurface water management, and the preparation of construction drawings, construction specifications, and cost estimates.			
EDUCATION (Degree, Year, Specialization)			
BS, Civil Engineering Technology, 1990, University of Pittsburgh			
MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS		REGISTRATION (Type, Year, State)	
N/A		Professional Engineer, 1997, PA NCEES, 2005	
13a. Personal History Statement of Principals and Associates RESPONSIBLE FOR LANDFILL CLOSURE DESIGN (name type of design or work) (Furnish complete data but keep to essentials)			
NAME & TITLE (Last, First, Middle Int.)	YEARS OF EXPERIENCE		
	YEARS OF ENGINEERING EXPERIENCE:	YEARS OF LANDFILL CLOSURE EXPERIENCE:	YEARS OF LANDFILL CONSTRUCTION MONITORING EXPERIENCE:
Gray, Thomas A., PE Technical Advisor	35	17	9
Brief Explanation of Responsibilities:			
Mr. Gray has been involved with landfill design, closure and construction management. He previously worked at GAI Consultants and managed their Charleston, WV office. His landfill project experience includes the S&S Landfill near Jane Lew, WV, the design of the Fayette County Landfill closure under the WVDEP Landfill Closure Assistance Program, the Capels Landfill in McDowell County, WV, and a variety of other municipal landfills.			
EDUCATION (Degree, Year, Specialization)			
BS, 1973, Mining Engineering, Penn State University MBA, 1977, Business Administration, University of Pittsburgh			
MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS		REGISTRATION (Type, Year, State)	
Society of Mining Engineers – Distinguished Member Society of American Military Engineers Engineering Society of Western Pennsylvania		Professional Engineer, 1988, WV Professional Engineer, 1978, PA Professional Engineer, 1980, VA Professional Engineer, 1989, MD	

13a. Personal History Statement of Principals and Associates **RESPONSIBLE FOR LANDFILL CLOSURE DESIGN** (name type of design or work) (Furnish complete data but keep to essentials)

NAME & TITLE (Last, First, Middle Int.)	YEARS OF EXPERIENCE		
	YEARS OF ENGINEERING EXPERIENCE:	YEARS OF LANDFILL CLOSURE/DESIGN EXPERIENCE	YEARS OF STORMWATER / E&S MANAGEMENT DESIGN EXPERIENCE
Cummings, Biff D., PE Technical Advisor	30	20	29

Brief Explanation of Responsibilities:

Mr. Cummings worked on **more than 15 landfill projects** and has performed landfill closure designs in numerous states including West Virginia. His experience also includes design, permitting, and closure of waste disposal areas such as lagoons, landfills, and coal refuse dams. He has particular expertise with remedial design and remedial actions that include closure plans, geosynthetic and clay caps, leachate collection, slurry and sheet pile walls, groundwater collection systems, and waste removal. He recently completed a design for a 3-acre, multi-layer landfill cap in AL, for which he was responsible for investigation, design, drawings, and bid specifications.

EDUCATION (Degree, Year, Specialization)

BS, 1978, Civil Engineering, Penn State University

MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS

American Society of Civil Engineers

REGISTRATION (Type, Year, State)

Professional Engineer, 2004, WV
Professional Engineer, 1984, PA
Professional Engineer, 1994, OH
Professional Engineer, 2006, IL
Professional Engineer, 2005, AL
Professional Engineer, 2004, IN

13a. Personal History Statement of Principals and Associates **RESPONSIBLE FOR LANDFILL CLOSURE DESIGN** (name type of design or work) (Furnish complete data but keep to essentials)

NAME & TITLE (Last, First, Middle Int.)	YEARS OF EXPERIENCE		
	YEARS OF ENGINEERING EXPERIENCE:	YEARS OF ENVIRONMENTAL EXPERIENCE:	YEARS OF LANDFILL CLOSURE EXPERIENCE:
Witt, Daniel C., PE Project Engineer	20	17	13

Brief Explanation of Responsibilities:

Mr. Witt has worked on **more than 15 landfill projects** and is experienced in closure designs for landfills. He served as the project manager, project engineer, and design engineer on landfill closure designs in PA, VA, NJ, and CT. Mr. Witt was responsible for all aspects of the design including pre-design investigation; final design; coordination with the client, regulatory agencies, and the public; budgets; and schedules. Mr. Witt has also developed and implemented investigations to delineate uncontrolled landfills for closure. Mr. Witt has managed two Superfund sites in Pennsylvania for U.S. EPA Region III and provided remedial design/remedial action oversight for the closure of these uncontrolled landfills.

EDUCATION (Degree, Year, Specialization)

BS, 1987, Civil Engineering, Penn State University

MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS

N/A

REGISTRATION (Type, Year, State)

Professional Engineer, 1993, PA

13a. Personal History Statement of Principals and Associates **RESPONSIBLE FOR LANDFILL CLOSURE DESIGN** (name type of design or work) (Furnish complete data but keep to essentials)

NAME & TITLE (Last, First, Middle Int.)	YEARS OF EXPERIENCE		
	YEARS OF GEOLOGY EXPERIENCE:	YEARS OF ENVIRONMENTAL EXPERIENCE:	
Evans, Timothy S., PG Project Geologist	16	16	

Brief Explanation of Responsibilities:

Mr. Evans is a Senior Geologist at Tetra Tech with over 16 years of professional experience. He provides geologic and hydrogeologic technical support principally for environmental investigation and remediation projects. He has managed a variety of projects including Environmental Site Assessments and geologic / hydrogeologic projects. His landfill experience includes the Portsmouth Navy Shipyard Landfill OM&M Plan, RCRA investigations for a military landfill and waste sites, NSWC Dahlgren Remediation for a Landfill Cap, and drilling/installing monitoring wells adjacent to landfills.

EDUCATION (Degree, Year, Specialization)

BS, 1991, Geology, Ohio University

MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS	REGISTRATION (Type, Year, State)
Pittsburgh Geological Society National Groundwater Association	Licensed Remediation Specialist, 2007, WV Professional Geologist, 1999, PA Professional Geologist, 2000, SC Professional Geologist, 2001, ID Certified Geologist, 2008, ME

13b. Personal History Statement of Principals and Associates **RESPONSIBLE FOR LANDFILL CLOSURE QA/QC** (Furnish complete data but keep to essentials)

NAME & TITLE (last, first, middle Int.)	YEARS OF EXPERIENCE		
	YEARS OF ENGINEERING EXPERIENCE:	YEARS OF CONSTRUCTION QA/QC EXPERIENCE:	
Strassner, Andrew, L., PE Project Engineer	5	4	

Brief Explanation of Responsibilities:

Mr. Strassner has performed design, construction inspection/management, and quality control activities for various projects involving industrial site remediation and landfill cell construction and soil cover placement. Construction management responsibilities include work plan preparation, permit acquisition, construction scheduling, coordination and direction of subcontractors, oversight of daily operations, health and safety monitoring, investigative derived waste management, technical report preparation, permit-compliance report preparation, and client and regulatory interface.

EDUCATION (Degree, Year, Specialization)

BS, 2003, Environmental Systems Engineering, Pennsylvania State University

MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS	REGISTRATION (Type, Year, State)
National Ground Water Association	Professional Engineer, 2008, PA Wastewater System Operator, 2007, PA Stormwater Management Inspector, 2007, FL

13c. Personal History Statement of Principals and Associates RESPONSIBLE FOR HEAVY EARTH WORK CONSTRUCTION PROJECTS (Furnish complete data but keep to essentials)			
NAME & TITLE (last, first, middle int.)	YEARS OF EXPERIENCE		
	YEARS OF ENGINEERING EXPERIENCE	YEARS OF HEAVY EARTHWORK EXPERIENCE	
Neumann, Christopher Construction Manager	16	16	
Brief Explanation of Responsibilities			
<p>Mr. Neumann's construction management responsibilities include work plan preparation, applicable permit acquisition, construction scheduling, hiring and supervision of craft labor, coordination and direction of subcontractors, erosion and sediment control installation and inspection, management of daily operations, onsite safety for construction, heavy equipment operation, remediation derived waste (RDW) management, investigative derived waste (IDW) management, technical report preparation and presentation, and client and regulatory interface. His landfill project experience includes the design and construction of a landfill in Fernald, OH for the DOE and the design of a cover for an inactive landfill in Quantico, VA.</p>			
EDUCATION (Degree, Year, Specialization)			
BS, 1993, Civil Engineering Technology, University of Pittsburgh			
MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS		REGISTRATION (Type, Year, State)	
N/A		N/A	

14. PROVIDE A LIST OF SOFTWARE AND EQUIPMENT AVAILABLE IN THE PRIMARY OFFICE WHICH WILL BE USED TO COMPLETE THIS PROJECT (City of Kingwood Landfill Closure Project)
Microsoft Office Professional (includes Excel and Word)
Microsoft Project
AutoCAD Map 3D 2008 / AutoCAD 2008
AutoDesk Civil 3D 2007
ESRI ArcGIS 9.2
ESRI ArcView 3.3
Bentley PondPack (Haestad Methods) Version 9.0
Bentley Flow Master (Haestad Methods)
Bentley HEC-Pack
STABL5M
Hydrologic Evaluation of Landfill Performance (HELP)
Groundwater Vistas Version 3.5 (MODFLOW based 3D finite difference model, including MT3D, RT3D, MODPATH, MODFLOWT, and SWIFT components)
GMS (MODFLOW based 3D finite difference model, including MT3D, RT3D, MODPATH and 3-D spatial analysis components)
Visual MODFLOW (MODFLOW based 3D finite difference model, including MODPATH)
SWANFLOW (3D finite difference model specializing in 3-phase fluid flow in porous media – water, NAPL, air)
Several analytical-based software packages including BIOCHLOR, BIOSCREEN, and SESOIL
Adobe Photoshop
Adobe Acrobat Version 8.0

15. CURRENT ACTIVITIES ON WHICH YOUR FIRM IS THE DESIGNATED ENGINEER OF RECORD ASSOCIATED WITH OR RELATING TO LANDFILL CLOSURE OR CONSTRUCTION.				
PROJECT NAME, TYPE AND LOCATION	NAME AND ADDRESS OF OWNER	NATURE OF YOUR FIRM'S RESPONSIBILITY	ESTIMATED CONSTRUCTION COST	PERCENT COMPLETE
Small Landfill Corrective Action Design (Cap/Closure) Former Naval Air Station South Weymouth Weymouth, Massachusetts	Mr. Brian Helland Remedial Project Manager Naval Facilities Engineering Command – MidAtlantic BRAC Program Management Office, Northeast 4911 South Broad Street Philadelphia, PA 19112-1303	Engineering & design	\$1.1 million	90% Engineering & design
Heavy Equipment Training Area Remedial Design (Cap/Closure) Naval Construction Battalion Center Gulfport, Gulfport, Mississippi	Mr. Art Conrad Remedial Project Manager Naval Facilities Engineering Command, Southeast 2155 Eagle Drive North Charleston, South Carolina 29419-9010	Engineering & design	\$3.7 million	60% Engineering & design
Naval Support Activity Mechanicsburg – Site 5 Golf Course Landfill	Jeffrey Henning Department of the Navy NAVFAC Mid-Atlantic 9742 Maryland Ave Norfolk, VA 23511	Remedial Investigation Remedial Design Construction Oversight	\$200,000	95% Engineering & design

TOTAL NUMBER OF PROJECTS:
#3

TOTAL ESTIMATED CONSTRUCTION COSTS:
\$ 5 Million

16. CURRENT ACTIVITIES ON WHICH YOUR FIRM IS SERVING AS A SUB-CONSULTANT TO OTHERS RELATING TO LANDFILL CLOSURE AND CONSTRUCTION.

PROJECT NAME, TYPE, AND LOCATION	NATURE OF FIRMS RESPONSIBILITY	NAME AND ADDRESS OF OWNER	ESTIMATED COMPLETION DATE	ESTIMATED CONSTRUCTION COST:	
				ENTIRE PROJECT	YOUR FIRMS RESPONSIBILITY
NA					

17. COMPLETED WORK WITHIN LAST 5 YEARS ON WHICH YOUR FIRM WAS THE DESIGNATED ENGINEER OF RECORD (List 5 to 7)				
PROJECT NAME, TYPE AND LOCATION	NAME AND ADDRESS OF OWNER	ESTIMATED CONSTRUCTION COST	YEAR	CONSTRUCTED (YES OR NO)
Herbicide Orange Storage Area Roller Compacted Concrete Cap Naval Construction Battalion Center Gulfport, Gulfport, Mississippi	Mr. Art Conrad Remedial Project Manager Naval Facilities Engineering Command, Southeast 2155 Eagle Drive North Charleston, South Carolina 29419-9010	\$8.0 million	2006	Yes
Olsen Road Landfill (Multilayer Cap/Closure) Indian Head Naval Surface Warfare Center Indian Head, Maryland	Mr. Joseph Rail Remedial Project Manager Naval Facilities Engineering Command, Washington 1314 Howard Street, SE Washington Navy Yard, D.C. 20374-5018	\$3.7 million	2006	Yes
Defense Property Disposal Office Yard Landfill Closure Naval Weapons Station Earle, Colts Neck, New Jersey	United States Navy Naval Weapons Station Earle, 201 Highway 34 South, Colts Neck NJ 07722.	\$820,000	2005	Yes
Jacks Creek Disposal Site, Maitland, PA	Rashmi Mathur U.S. Environmental Protection Agency Region III 1650 Arch Street Philadelphia, PA 19103-2029	\$250,000	2005	Yes
SWMU 68 LF06 – Landfill Closure Design, Charleston AFB, Charleston, SC	Al Urrutia Charleston AFB 437 CES/CEVP 100 W. Stewart Ave Charleston AFB, SC 29404	\$1 million	2005	Yes
Cove 1 Landfill Removal Action – Naval Recreation Center Solomons, Solomons, Maryland	Margaret Wright NAVFAC Washington 1314 Harwood Street, SE Washington Navy Yard, DC 20374-5018	\$200,000	2008	Yes

18. COMPLETED WORK WITHIN LAST 5 YEARS IN WHICH YOUR FIRM HAS BEEN A SUBCONSULTANT TO OTHER FIRMS (INDICATE PHASE OF WORK WHICH YOUR FIRM WAS RESPONSIBLE) LIST 5 TO 7.

PROJECT NAME, TYPE AND LOCATION	NAME AND ADDRESS OF OWNER	ESTIMATED CONSTRUCTION COST OF YOUR FIRM'S PORTION	YEAR	CONSTRUCTED (YES OR NO)	FIRM ASSOCIATED WITH
N/A					

19. Use this space to provide any additional information or description of resources supporting your firm's qualifications to perform work for the WV Department of Environmental Protection.

Tetra Tech is a recognized engineering company with an extensive pool of resources. In addition to the approximately 200 people in our Pittsburgh office, our firm has the ability to utilize the skills of over 10,000 Tetra Tech employees across more than 275 offices worldwide in the United States, France, Germany, India, South Korea, Philippines, Republic of Panama, and United Arab Emirates. Tetra Tech has over 750 registered Professional Engineers and Professional Geologists and in 2008, had sales totaling over \$2 billion. The firm's federal government clients have included the US Environmental Protection Agency, the Army, Navy, Air Force, US Department of Homeland Security, NASA, US Department of Energy, and the US Postal Service.

While this project would be managed out of our Pittsburgh office, Tetra Tech also has an office location in Charleston, West Virginia, which can support this project. Tetra Tech has been dedicated to the state of West Virginia and The WV Department of Environmental Protection is our Charleston office's largest client. In addition, our major subconsultant, Triad Engineering, is located in Morgantown, West Virginia.

The skill of Tetra Tech is evidenced by our 2008 Engineering News Record rankings, which include **#1 rankings** in water supply and treatment and desalination. The firm is also ranked in the **top ten companies** for site assessment and compliance, chemical and soil remediation, environmental science, environmental management, and consulting/studies. Tetra Tech is ranked as the **6th largest** environmental firm and the 8th largest design firm. The U.S. Navy has noted our quality work with landfills. For our work on the White Oak Sites 1 & 2 Landfill projects, the Navy commented "*Tetra Tech exhibited knowledge, good experience and professionalism throughout the design stages*" while offering 'Outstanding' ratings on various aspects of the project.

Tetra Tech specializes in landfill closure design as demonstrated by our project descriptions and matrix (Attachment 1). Tetra Tech's landfill-related services include:

- **Landfill Engineering & Design** – Landfill closure and post-closure planning and engineering, liner and final cover design, leachate management systems, leachate treatment plant design, master plans, fill sequencing plans, and regulatory permitting and compliance
- **Construction Services** – Trenching, piping/plumbing, welding, drilling, grading, instrumentation, building pads, groundwater extraction and treatment system construction, landfill gas extraction, leachate conveyance system construction, and landfill gas/groundwater well installation
- **Construction Management** – Construction engineering support, project administration, preparation of bid packages, including drawings and specifications, development of bid evaluation procedures, procurement and contracting strategies during bid review/award process, field inspection, contract negotiations, construction documentation and scheduling, and construction certification
- **Landfill Gas Engineering** – Gas migration investigations, estimates of landfill gas generation, health risk screening analysis, collection system design, processing and treatment design, landfill gas/air monitoring, flare station design, landfill gas system construction and start-up, landfill gas-to-energy development
- **Landfill Gas System Operation, Maintenance, and Monitoring (OM&M)**– Probe monitoring, condensate system O&M maintenance, inspection of piping/valving/fittings, treatment system OM&M, blower inspection, remote telemetry system monitoring, control system monitoring and header adjustment, engineering analysis, and source testing.

20. The foregoing is a statement of facts

Signature: Mark P. Speranza (for Mark Speranza)

Title: Pittsburgh Operations Manager

Printed: Name: Mark P. Speranza, PE

Date: August 10, 2009



Client Name
Confidential Industrial Client

Project Highlights

- Landfill closure work plan including drawings and specifications
- Evaluation of remedial alternatives
 - Permitting
- Design of erosion and sedimentation controls
- Annual Groundwater Monitoring Report

Project Cost
\$200,000

Tetra Tech was retained by a confidential client to perform an evaluation and prepare a design and Remedial Action Work Plan for the closure of a landfill located along the Ohio River in West Virginia. The 5-acre landfill contained wastes from past disposal operations at the client's plant that, based on previous investigation, were impacting groundwater.

Tetra Tech:

- Performed a site characterization
- Prepared technical and economic evaluations of various options and recommended a preferred solution
- Designed a landfill cap consisting of a multi-layer system that included a geomembrane and geocomposite drainage layer
- Prepared a Remedial Action Work Plan for submittal to USEPA and the West Virginia Department of Environmental Protection (WVDEP)
- Designed stormwater management and sedimentation and erosion control facilities, including a basin to serve both functions
- Prepared a work plan for the installation of a recovery well and conveyance system for groundwater extraction and containment
- Prepared design drawings and technical specifications for bidding and construction of the closure system
- Prepared and submitted a Site Registration Application Form - Construction Storm Water - WV/NPDES General Permit
- Ongoing annual reporting of groundwater monitoring



Client Name
U.S. EPA Region 3

Project Highlights
▪ Design for an impermeable cap for the landfill

▪ Landfill closure activities

▪ Technical support to the EPA and regulatory compliance

Tetra Tech was authorized by the U.S. EPA to perform Remedial Design for an impermeable cap for a 10-acre landfill in central Pennsylvania. The design services included evaluation and selection of suitable construction materials for a flexible membrane liner. Landfill closure activities included deed restrictions, collection and venting of landfill gases, and stormwater management. Trichlorethylene, benzene, and dichlorobenzene were causes of contamination on the site. Tetra Tech provided technical support to the EPA for all of the following tasks:

- Site survey
-
- Wetlands study
-
- Groundwater sampling and analysis
-
- Preparation of Quality Assurance, Health and Safety, and Field Sampling Plans
-
- Design plans and specifications for:
 - a multi-layer, impermeable cap
 - a passive gas vent system with capability for odor control
 - an appropriate contour for surface water control/site drainage;
 - access roads for movement of construction vehicles, and
 - a groundwater monitoring program to evaluate the effectiveness of the remedy through the post closure period
- Detailed operation and maintenance plan
-
- Bid and contract documents for remedial construction
-
- Compliance with all applicable requirements and regulations



Client Name

Lexington-Fayette Urban County Government

Project Highlights

- Largest landfill closure to-date in the state of Kentucky
- Use of synthetic materials in the closure cap reduces the client's cost by 25%
- Provided construction quality assurance and certification services
 - Leachate management

Project Cost

\$9.4 Million

This innovative closure plan is for a 105-acre landfill, making it the largest landfill closure to-date in Kentucky. The closure design met the newest and most stringent landfill regulations for municipal solid waste landfills. Although the landfill had operated historically as a municipal solid waste landfill, a portion of the area on top of the fill remains in use as a construction debris (CD/D) landfill.

Key features of the proposed closure are:

- Use of synthetic materials in the closure cap eliminates the need to purchase and transport large volumes of expensive gravel and clay and reduces cost by about 25%.
- Design of an equalization basin and man-made wetlands to treat large quantities of leachate during the post-closure life of the facility. This system replaces the practice of pumping leachate from 30 manholes and hauling it 20 miles to LFUCG's treatment plant, resulting in significant savings over the post-closure life of the facility.
- Development of an incremental closure approach, allowing the continued operation of the CD/D disposal cell for four additional years. The incremental closure spreads costs over a five-year period and provides a continuing revenue stream from the CD/D operation.
- Initial Tier I calculations indicated that the landfill would require an active methane collection system. Tetra Tech performed Tier II testing, which showed that gas generation has peaked and is at a level that allows the use of a passive versus active methane collection system.

Tetra Tech provided construction quality assurance and certification services for constructing nearly 42 acres of closure cap, as well as the leachate handling and treatment system.





Wetland Leachate Treatment for Haley Pike Solid Waste Landfill Closure

Fayette County, KY

Tetra Tech provided engineering and environmental science consulting services for the largest landfill closure to date in the Commonwealth of Kentucky. This project is the multi-phase closure of Lexington's 105-acre Haley Pike Solid Waste Landfill.

Tetra Tech prepared engineering plans and specifications suitable for bidding and in addition to managing the large size of the project. Tetra Tech's regulatory specialists guided the incremental closure concept through the state's regulatory program. The concept is to close the landfill in roughly equal increments over a five-year period, spreading the closure expense over time, while continuing to operate the construction/demolition debris (C/DD) landfill located on a portion of the closure site.

Closure planning and design addressed the various environmental requirements of the Kentucky Division of Waste Management and Air Quality, including:

- Leachate collection and treatment
- Tier 2 gas monitoring
- Methane gas collection system
- Groundwater assessment and monitoring plan

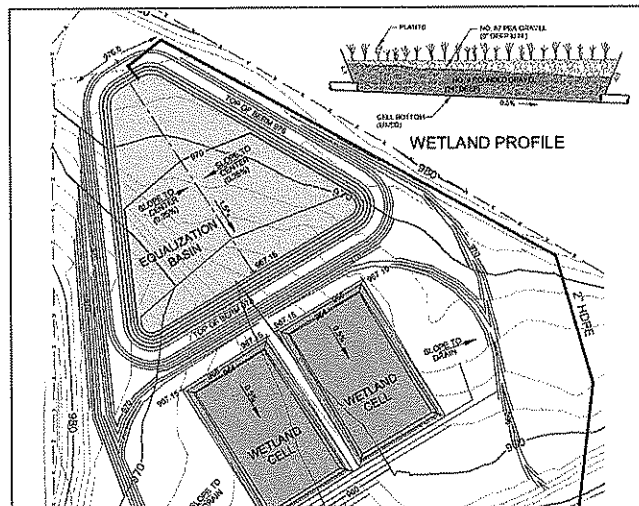
Because of the long term cost consequences of transporting and treating leachate, Tetra Tech conducted a further investigation into the use of constructed wetlands for wastewater treatment. Use of a natural system to treat landfill leachate reduces disposal and treatment costs and reduces conventional pollutants in the landfill property. The investigation concluded that this technique could be used and would result in significant savings.

Client Name
Lexington-Fayette Urban County
Government

Project Highlights

- Largest landfill closure to-date in the state of Kentucky
- Use of a natural system to treat landfill leachate reduced disposal and treatment costs and conventional pollutants - this technique could be used and result in significant savings
- Provided construction quality assurance and certification services

Project Cost
\$900,000





Client Name

U. S. EPA Region III

Project Highlights

- *Investigation, study, design, permitting, and construction of landfill closure*
- *Remedial design includes a landfill cap, leachate collection trench, leachate pipeline, sanitary sewer line upgrades, new pump stations and treatment plant upgrades*
- *Managed 10 subcontractors who all met schedule, cost and technical requirements*
- *Interfaced with federal, state, and county officials, utility companies, a local organization, and residents*

Project Cost

\$1.3 Million

Tetra Tech performed the site investigation, feasibility study, remedial design, and remedial action at the Kim-Stan Landfill. This National Priorities List site in southwestern Virginia operated as a sanitary/industrial waste landfill and reportedly received 865,000 tons of waste between 1972 and 1990. Waste included PCB-contaminated oils, medical waste, and aluminum sludges.

Tetra Tech developed a cost-effective solution, including:

- A 26.5-acre, multi-layer landfill cap
- 45,250 square feet of leachate collection trench, installed using an innovative biopolymer slurry
- A comprehensive stormwater management system
- Native plant landscaping to blend the cap with surrounding terrain
- Engineered subsurface wetlands system for leachate pre-treatment
- Over 4,600 feet of force main sewers and upgrading over 3,000 feet of sanitary sewer
- Three new major pump stations and upgrading an existing pump station
- Upgrading 250,000-gallon sequence batch reactor at the Publicly Owned Treatment Works

The management approach of dividing the work into three separate designs (landfill; leachate pipeline/sewer upgrade; POTW upgrade) contributed to meeting technical requirements on an accelerated schedule.

EPA noted that the remedial design was *“an overwhelming success ... this was a very critical project that was accomplished in an extremely expedited time frame, 6 months, that led to a final design being submitted on-time and under budget.”*



Client Name

Naval Facilities Engineering Command

Project Highlights

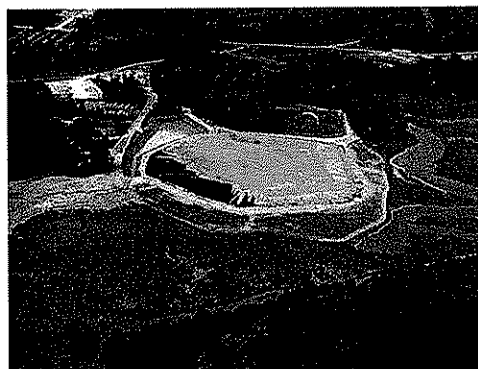
- 3-D groundwater and contaminant transport modeling to optimize remedy and achieve remediation goals
- Minimized potential for migration of contamination to adjacent tributary
- Remedy used cost-effective passive approach

Project Cost
\$2.7 Million

Tetra Tech provided groundwater and contaminant transport modeling, remedial design, and engineering support and oversight for closure of an uncontrolled landfill located at a naval facility. The Disposal/Burn Area is a 12 acre inactive landfill located adjacent to a tidally influenced tributary of the Potomac River and wetlands. Historic information indicated that the area was used as a sanitary landfill from the early 1940s until 1984 for disposal of approximately 100,000 cubic yards of chemical, municipal, and miscellaneous waste.

Tetra Tech performed modeling to simulate pre-remediation and post-remediation scenarios, including capping the landfill, covering the marsh and back channel area, and installing an upgradient cut-off wall. The goal of the modeling was to determine the remedy that minimized long-term groundwater impacts to the tributary, protected ecological receptors, and achieved remediation goals. Tetra Tech:

- Completed a remedial investigation, feasibility study, pre-design investigation, and remedial design and provided continuous oversight during remediation.
- Designed a 6-acre multilayered cap over the landfill. The multilayered cap consisted of vegetative soil cover, separation geotextile, gravel drainage layer, cushion geotextile, 60-mil LLDPE geomembrane, geosynthetic clay liner, and bedding/gas venting layer.
- Designed a soil cover for the contiguous marsh (2 acres) and tributary back channel area (1 acre), and shoreline protection. The design incorporated geogrid, high strength stabilization geotextile, riprap, and gabions.
- Designed a passive gas management system.
- Designed a large basin as a borrow source for the landfill cap materials, as a sediment pond for erosion control during construction, and finally as a high marsh wetland to offset wetland losses from capping.
- Dug a continuous test pit to determine the limit of waste adjacent to the cut-off wall alignment.
- Planned and supervised the drilling of soil borings to determine the location and depth of a 640-foot long soil-bentonite cut-off wall.





Client Name
City of Manistique

Project Highlights

- Use of state-of-the-art multi-port wells and dedicated sampling equipment to analyze groundwater samples from various depths from single monitoring wells
- Work Plans developed for each phase of hydrogeological investigation received MDEQ approval
- Design of cost-effective closure cap

The Manistique Landfill is a Type II landfill that was used by local townships, industry and the City of Manistique.

Tetra Tech performed initial hydrogeological studies and identified environmental contamination consisting of groundwater impacted by volatile and semivolatile organic compounds and metals. The contaminants percolated as dissolved phase leachate to the groundwater surface and appear to have migrated to the bedrock surface below the permeable sand. Bedrock depth varies from 110 to 150 feet below grade.

As an unlined landfill, Tetra Tech's initial tasks included determining whether any leachate was leaving the site. The hydrogeological investigation indicated that leachate had migrated off-site and was impacting local, private property. Tetra Tech completed a Work Plan for each subsequent phase of the hydrogeological investigation. Each received MDEQ review and approval.

Because the chlorinated organic compounds, dissolved metals and volatile organic compounds are near bedrock, Tetra Tech used state-of-the-art multi-port wells and dedicated sampling equipment to collect and analyze groundwater samples from various depths from single monitoring wells. Soil sampling and lithological evaluation was conducted during well installation.

Tetra Tech also excavated around the perimeter of the landfill to determine the outer limits of the buried waste. Using a backhoe, the debris limits were delineated through excavation and visual confirmation, then flagged for later surveying and mapping. This information was used to develop a design to cap the landfill. Tetra Tech sought to design the most cost-effective closure cap possible. Tetra Tech evaluated three options: imported clay, a PVC cap, and a cap constructed of a composite liner.



Landfill Closure Design Using Soil Cover with Phytoremediation

Naval Support Facility, Dahlgren, VA

Client Name
Naval Facilities Engineering Command

Project Highlights

- *Soil cover coupled with phytoremediation was functionally equivalent to State closure standards at a lower cost*
- *Created 1 acre of additional wetland*
- *Consolidated the landfill footprint and made 1.5 acres available for future development*

Project Cost
\$1.7 Million

Tetra Tech provided site investigation, feasibility study, pre-design investigation, remedial design, and consulting services during construction for the 1400 Area Landfill. This site was a sand and gravel borrow pit, bordered on two sides by wetlands, that was filled with municipal waste during the 1970s. This 5-acre landfill is underlain by a sand layer and a laterally persistent clay layer.

The design addressed risks associated with semi-volatile organic compounds, PCBs, pesticides, and metals at concentrations that were generally below industrial screening levels. Contaminated wetland area sediments were excavated and disposed offsite due to unacceptable ecological risk. Based on client preference, landfill waste was consolidated into a smaller area, providing 1.5 acres for future development. The waste was capped with a 2-foot thick soil cover which was planted with hybrid poplar trees. The soil cover, coupled with phytoremediation, was designed to provide the functional equivalence of a Virginia sanitary landfill cap. The trees on and around the soil cover also serve to reduce off-site migration of mercury in groundwater by reducing the hydraulic gradient and associated discharge of groundwater to surface water.

Tetra Tech prepared calculations to: 1) demonstrate that the 2-foot soil cover with phytoremediation would be hydraulically equivalent to a Virginia sanitary landfill cap; 2) determine the number and spacing of trees to achieve hydraulic equivalence to a Virginia sanitary landfill cap; and 3) determine the number and spacing of trees required to reduce the hydraulic gradient beneath the site and associated groundwater-to-surface water flow.





Client Name
U.S. EPA Region 7

Project Highlights

- Oversight of closure activities of the landfill
 - Project fulfilled all of the RCRA closure requirements
 - Regular site visits to deal with complications caused by weather

Project Cost
\$26,000

The Black Hawk County Landfill is a municipal landfill, which is managed by the Black Hawk County Solid Waste Management Commission. This landfill previously accepted RCRA hazardous waste among its municipal and industrial refuse.

Tetra Tech was assigned to oversee closure activities at this landfill. Those activities included:

- placing 2 feet of compacted clay over the graded landfill
- installation of a PVC liner, Geonet, and Geotextile fabric over the compacted clay
- placing 3 feet of select fill on the synthetic liner
- placing a 6-inch layer of topsoil over the select fill.

During the closure, Tetra Tech sent personnel to the site 11 times to oversee closure activities. Several complications occurred during installation of the landfill cap. Wind, rain, cold temperatures and difficulties with compaction of the clay resulted in delays in completion of the project and in the need for daily coordination between Tetra Tech personnel and the EPA work assignment manager.

Also, when the cap was nearly completed, several Shelby tube samples of the clay cap failed the permeability tests. The liner in those areas then had to be removed, and the clay in those portions of the landfill had to be recompacted.

Tetra Tech's inspections, which were documented with photographs and trip reports, ultimately determined that the cap met all of the RCRA closure requirements.



Client Name
Naval Facilities Engineering
Command

Project Highlights

- Negotiated variance to State landfill closure regulations
- Effective cap at a substantial cost savings
- Restored 0.4 acre wetland

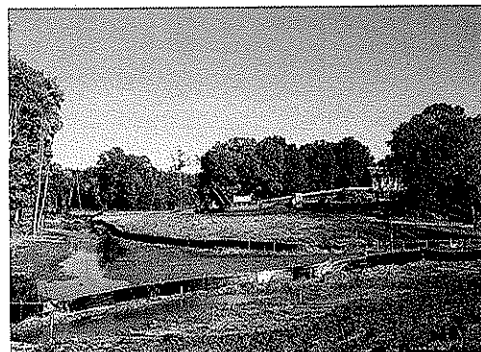
Project Cost
\$938,600

Tetra Tech completed a site investigation, evaluation, and remedial design for the Town Gut Landfill. This 4-acre site was operated between 1968 and 1980 for the disposal of approximately 70,000 cubic yards of landscaping waste, fill material, and rubble. Unauthorized items reportedly dumped at the site included paints, varnishes, and other chemical wastes.

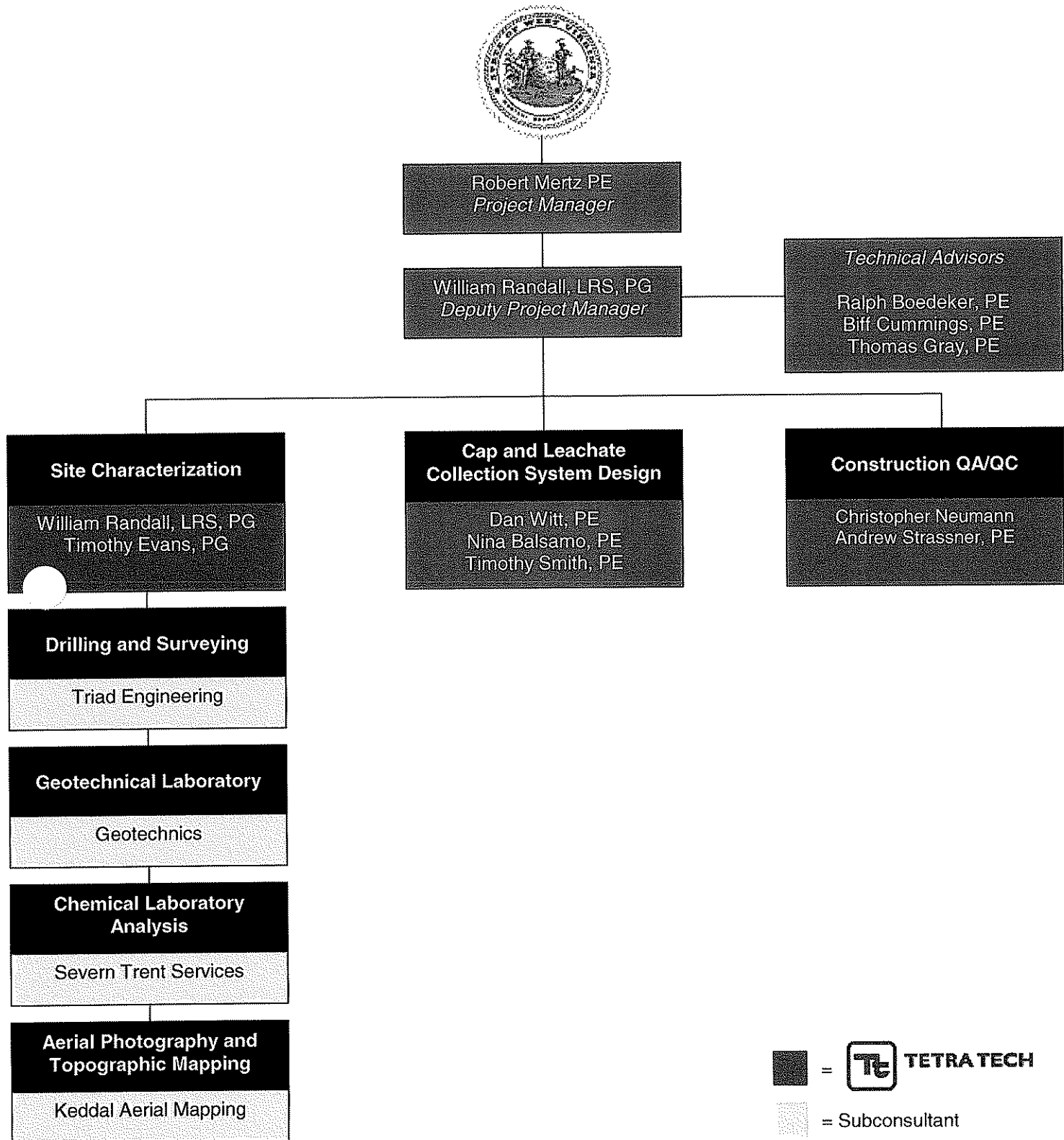
A pond bisects the northern and southern portions of the site, and a tidally-affected pond adjacent to the southern portion of the site governed the groundwater table at the landfill. The adjacent ponds were not affected by groundwater contamination from the landfill.

A variance to Maryland landfill closure regulations was successfully negotiated. The variance allowed the landfill to be closed with a 2-foot thick soil cover in lieu of an impervious cap. Construction of the soil cover greatly reduced the capital cost while conforming to State requirements. Contaminated soil and accumulated debris were removed from 0.4 acres of wetlands to allow the installation of the 2-foot thick soil cover. The original shoreline contours were maintained and the pre-existing habitat was restored.

Tetra Tech also provided general consulting services throughout construction, including reviewing contractor submittals and variance requests. Deed restrictions were prepared to prohibit residential development on the landfill and use of site groundwater as a source of drinking water.



Tetra Tech Proposed Organizational Chart



ROBERT C. MERTZ, PE
PROJECT MANAGER
PITTSBURGH, PENNSYLVANIA

EDUCATION: M.E., Civil Engineering, The Pennsylvania State University, 1991
B.S., Civil Engineering, The Pennsylvania State University, 1983

REGISTRATIONS: Professional Engineer, West Virginia, 1997 (#013519)
Professional Engineer, Ohio, 1997 (E-61986)
Professional Engineer, Pennsylvania, 1990 (PE-040659-E)

TRAINING: 29 CFR 1910.120 OSHA 40-Hour Hazardous Waste Operations and Emergency Response Standard (1990), 8-Hour Annual General Site Worker Refresher Training (2007), Management and Supervisor Training (1992), 8-Hour Annual Supervisor Refresher Training (2007)

PROJECT EXPERIENCE:

Project Manager; Landfill Closure Design at Site 17 1400 Area Landfill, NSWC Dahlgren; Dahlgren, VA. Responsible for the management and preparation of a remedial design scope of work, basis of design report, erosion and sediment control plan report, stormwater pollution prevention plan, construction drawings, specifications, cost estimate, and supporting calculations.

Project Engineer; Closure Design at Sayreville Landfill III Superfund Site; Sayreville, NJ. Designed closure plan for a 22-acre Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) landfill located in a tidally influenced wetland and floodplain. Designed the cap, passive gas venting system and soil erosion and sediment control system; prepared the design report, Operation and Maintenance manual and closure and post-closure cost estimates; established and successfully negotiated approval of the sedimentation and erosion control plan; prepared construction bid documents; provided contractor procurement assistance; and provided engineering support during construction of the \$4 million closure.

Project Engineer; Geotechnical Investigation, Landfill Closure Design and Permitting for Municipal Waste Landfill; Cape May County, NJ. Prepared closure plan documentation for both \$2.3 million 16-acre and \$1.3 million 14-acre landfills. Designed cap, surface water management system, and passive gas venting system; prepared design/construction drawings, calculation brief, specifications and QA plan; and provided engineering support during construction activities.

Lead Engineer; Closure Design Alternatives at Site 3 Small Landfill at Former NAS South Weymouth; Weymouth, MA. Reviewed available site characterization data and subsequently reevaluated closure design alternatives presented in the Corrective Action Alternatives Analysis performed by others. Prepared detailed cost estimates and was responsible for the preparation of the draft corrective action design.

Lead Engineer; Landfill Closure Design of Site 4 Golf Course Landfill; NCBC Gulfport, MS and North Charleston, SC. Responsible for the management and preparation of draft and final remedial design submittals for a landfill operated from 1966 until 1972. Waste material was disposed in trenches, burned daily, and then the trenches were backfilled. As much as 200,000 gallons of waste liquids may have been disposed at the site including fuels, oils, solvents (methyl ethyl ketone, toluene, xylene), paints, and paint thinners.

Project Engineer; Landfill Closure Design at Site 42 Olsen Road Landfill at Indian Head Division, NSWC; Indian Head, MD. Responsible for the management and preparation of remedial design basis of design report, erosion and sediment control plan report, stormwater pollution prevention plan, construction drawings, specifications, cost estimate, and supporting calculations for a remedy that consisted of construction of an engineered cap to address contaminated surface soil and landfilled materials.

Project Engineer; Landfill Closure Design Oversight for Welsh Road Landfill Superfund Site; Honey Brook Township and Caernarvon Township, PA. Provided senior review of remedial design submittals that included an evaporation/transpiration (E/T) cover system and associated performance monitoring for a 5.2 acre landfill.

Project Engineer; Landfill Closure Design/Build RFP for Site 1 West Gate Landfill and Site 2 Rubble Disposal Area at NAS South Weymouth; Weymouth, MA. Responsible for assessing the need for a pre-design investigation in support of a remedial design, and for scoping and preparation of a Design/Build RFP package for use by the Navy in procuring a contractor to provide remedial design and remedial action services for two landfills. The remedy for Site 1 consists of excavation and consolidation of landfill material from wetlands, low permeability soil cap, land use controls, and monitoring. The remedy for Site 2 consists of excavation and consolidation of polychlorinated biphenyl (PCB) contaminated sediments from wetlands, permeable soil cap, land use controls, and monitoring.

Design Engineer; Remedial Design at Site 46 Landfill A, Stump Dump Road, NSWC Dahlgren; Dahlgren, VA. Assisted in the preparation of and peer reviewed remedial design documents and prepared post-removal action report following the remedial action.

Project Engineer; Landfill Closure Design at Site 12 Town Gut Landfill, Indian Head Division, NSWC; Indian Head, MD. Responsible for the management and preparation of a landfill closure design basis of design report, erosion and sediment control plan report, stormwater pollution prevention plan, construction drawings, specifications, cost estimate, and supporting calculations.

Resident Engineer; Landfill Closure Quality Assurance, Construction Management, Field Engineering at Forest Waste Site; Otisville, MI. Provided field engineering, QA, and contract management assistance services to a Potentially Responsible Party committee at a CERCLA site for construction of a \$1.6 million, 10-acre composite barrier landfill cap (soil/geotextile/geonet/60 mil textured high density polyethylene (HDPE)/geosynthetic clay liner (GCL)/sand).

Project Manager; Landfill Closure QA/QC and Construction Management for Interim/Bypass Landfill, Doughty Road Site; Atlantic County, NJ. Provided contract management assistance services for construction of an 8.5-acre double-composite lined landfill cell and leachate storage facility.

Project Engineer; Facility Design and Permitting at Various Landfill Facilities; NJ, NY, OH, PA, VA and Puerto Rico. Prepared design and permit application documentation for several municipal solid/hazardous waste landfills located in five states and Puerto Rico. Performed geotechnical and sedimentation and erosion control analyses, prepared design narratives, specifications, cost estimates, CQA plans, and O&M manuals.

Project Engineer; Engineering Evaluation/Cost Analysis (EE/CA) for New England Landfill Superfund Site; Bennington, VT. Prepared an EE/CA within the Superfund Accelerated Clean-up Model for a non-time critical removal action at a municipal solid waste landfill. Specific alternatives evaluated for the Site consisted of capping of the landfill, polychlorinated biphenyls (PCB)-impacted soil removal, upgradient shallow groundwater diversion, leachate collection and treatment, gas management, and institutional controls.

**WILLIAM RANDALL, PG, LRS
DEPUTY PROJECT MANAGER
PITTSBURGH, PENNSYLVANIA**

EDUCATION: M.S.; Geology (Hydrogeology and Geophysics Options); Wright State University, 1988
B.S.; Geology; Northeastern University, 1983

REGISTRATIONS: Professional Geologist; Pennsylvania, No. PG-000725-G, 1994
Professional Geologist; Tennessee, No. 2171, 1991
Professional Geologist; Wisconsin No. 1111, 1997
Licensed Remediation Specialist: West Virginia, No. 207, 2007

TRAINING: OSHA 1910.120 40-Hour HAZWOPER Training (1987), 8-Hour Annual Refresher Training; (2009), 8-Hour Supervisory Training (1994)

PROJECT EXPERIENCE:

Geologist; Hydrogeologic Evaluation Under WVDEP LCAP Program; Clarksburg, Fayette County, Mingo County, Monongalia County, Montgomery City, Pine Creek, South Charleston Landfills, WV. Evaluated the groundwater monitoring systems associated with a portfolio of sites in West Virginia under the WVDEP Landfill Closure Assistance Program. The evaluations consisted of reviewing historical records, site visits, geophysical well log interpretation, downhole video logging, and hydrogeologic evaluation to determine if the existing wells and monitoring well network met the regulatory requirements. He worked on the following LCAP landfills: Clarksburg, Don's Disposal, Fayette Co., Mingo Co., Monongalia Co., Montgomery City, Pine Creek, and South Charleston.

Geologist; Landfill Delineation of Moundsville Landfill Closure Under WVDEP LCAP Program, WV. Performed an electromagnetic survey to delineate the boundaries of the landfill. Survey confirmed landfill boundaries extended beyond the known boundaries. By locating this waste before the final cap was constructed, the size of the cap could be reduced by relocating a minimal amount of waste, reducing the size and cost of the final landfill cap.

Geologist; Residual Waste Landfill Groundwater Monitoring Program; WV. Assisted the facility in negotiating groundwater issues associated with the facility's flyash landfill permit. His review of site conditions identified several wells which were poorly installed by a previous consultant, resulting in unrepresentative samples. Issues associated with the groundwater monitoring program were addressed in the revised permit and the suspect wells were replaced.

Geologist; Landfill Remediation and Closure with PADEP Negotiation; PA. Performed site investigation and waste characterization of historical municipal waste dumps in conjunction with a property transaction. Wrote work plan and health and safety plan for site investigation and remediation activities. Performed technical and health and safety oversight during site investigation and remediation of the identified waste disposal areas. Negotiated closure of the landfill with both the Waste Management and Water Quality Units of PADEP. Site has been officially closed.

Geologist; Landfill Remediation for a Confidential Client; Pottstown, PA. Provided technical and health and safety oversight for removal of 600+ drums from an illegal landfill. Site clean-up started as a PADEP enforcement action to remove surface drums. During the removal, evidence lead to the suspicion that some buried drums might be present. Performed and interpreted a magnetometer survey isolating potential disposal areas. Test pits discovered the presence of drums in these areas, and the drums were then removed. The waste in the drums was then characterized and disposed of in an approved facility.

Geologist; Waste Landfill Capping for a Confidential Client; Ohio River Valley. Managed, performed inspections, and completed Remedial Construction Report for river bank stabilization and waste disposal landfill area cap installation. Project received regulatory approval.

Geologist; RCRA Corrective Action for a Confidential Chemical Manufacturer, WV. The final RFI report, for which Mr. Randall was the principal author, was successfully completed on a tight schedule. The report included summaries of soil gas analysis, geophysical surveys, groundwater characterization, and soil sampling activities. Analytical data was incorporated into site-specific risk assessment scenarios to determine which units should be included in a corrective measure study and those which require no further action. The closure of all SWMUs at this facility were negotiated without the need for a corrective measure study. A presumptive remedy of an engineered soil cover was recommended for one SWMU group. Groundwater is addressed separately from the SWMUs and concerns associated with site wide groundwater quality are being addressed via a corrective measure study.

Geologist; Mayers Landfill Excavation and Capping; Delaware County, PA. Provided technical oversight to PA Department of Transportation and acted as liaison with the PA Department of Environmental Protection during the excavation and capping of this CERCLA site as part of the Blue Route construction project.

Geologist; Landfill Permitting for Inland Steel; East Chicago, IN. Co-authored the landfill permit application for a Class II landfill. Provided narrative for all aspects of the landfill design, geotechnical design, and hydrogeologic interpretation of this landfill permitted for construction on made-land within Lake Michigan.

Geologist; IRP Investigation for Three Landfills; Andersen AFB, Guam. Mr. Randall was the principal author of the waste characterization report and the no further response action planned decision document for Operable Unit 1. Served as co-author for the remedial investigation report. The reports evaluated three landfills located on the base.

Geologist; Experimental Flyash Landfill; PA. Performed sampling and prepared annual reports for an experimental flyash landfill. Instituted a quality control and quality assurance program into the groundwater sampling program. These QA/QC procedures reduced the occurrence of erratic analytical results. The preparation of the annual reports submitted to PADEP included the statistical analysis of 10 years of groundwater monitoring data.

Geologist; Resistivity Imaging, Migration Pathway Evaluation for PPL; Martins Creek, PA: As part of the response action and investigation of a fly ash release from several impoundments and a landfill to the Delaware River, Mr. Randall performed resistivity imaging to locate suitable well locations to intercept groundwater perceived to be a potential pathway for fly ash to enter the river.

Geologist; EPA Geophysical Surveys for Landfill Delineation at Numerous Sites; WV, PA, DE, MD, VA. Mr. Randall worked as a dedicated contractor on the EPA Region III - Field Investigation Team Contract. Designed, performed, and interpreted first geophysical surveys under this contract, which included total field magnetic, gradiometer, and electromagnetic conductivity surveys. The geophysics was performed primarily for landfill delineation and drum burial locations. Acquired training in EPA protocol for sampling, field methodologies, and the Hazardous Ranking System. Wrote over 100 geologic, hydrogeologic, and soil characterizations for CERCLA/SARA sites for preliminary assessments, site investigations, target population studies, extended site investigations, and screening site investigations. Field work included well installation, video and geophysical well logging, soil and rock boring, site reconnaissance, surface geophysics (magnetics and electromagnetics), and soil and water sampling. All work was performed in accordance with strict EPA protocol.

NINA J. BALSAMO, PE
PROJECT ENGINEER
PITTSBURGH, PENNSYLVANIA

EDUCATION: M. S., Civil Engineering; University of Pittsburgh; 1987
B. S., Civil Engineering; University of Pittsburgh; 1979

REGISTRATIONS: Professional Engineer, Pennsylvania; #033633; 1984
National Council of Examiners for Engineering and Surveying (NCEES); Certificate
Number 28026; 2006

TRAINING: OSHA 1910.120 40-Hour HAZWOPER Training (1990), 8-Hour Annual Refresher (1993)

PROJECT EXPERIENCE:

Designer; Conceptual Cap Designs for Closure of Industrial Waste Landfill; IN. Analyzed conceptual cap design for closure of an industrial waste landfill. Incorporated on-site and waste materials as low cost cap components. Performed veneer stability and HELP analysis. Cap incorporated double screened limestone, geocomposite drainage layer, geomembrane, and furnace dust cushion layer.

Civil Engineer; Olsen Road Landfill Post-Closure Long-Term Monitoring and Inspection Plan at NSF Indian Head; Indian Head, MD. Prepared plan for the periodic inspection of the engineered cap and for surface water and groundwater sampling, analysis, and data evaluation following closure of the landfill.

Civil Engineer; Erosion and Sedimentation Control for Four Waste Landfills Various Landfills; WV and PA. Performed calculations for erosion and sedimentation control at four residual waste landfills.

Lead Engineer; Capped Landfills O&M Manual for NSB New London; Groton, CT. Updated O&M manual for three capped landfills and updated the groundwater monitoring program for four monitored sites. Updated site histories, well tables, drawings, and inspection forms to reflect site changes, incorporated recommendations from landfill inspection reports and second 5-year review, and addressed regulator comments.

Civil Engineer; OU3 Former Landfill OM&M Manual Evaluation for Portsmouth Naval Shipyard; Kittery, ME. OU3 is a landfill that has been capped and converted to parking and recreation areas. In accordance with the site OM&M, the requirements were re-evaluated following the first four rounds of monitoring and inspections. Organized and summarized the inspection results and made recommendations for the future site maintenance program.

Civil Engineer; South Weymouth Small Landfill Cap Design; Weymouth MA. Assisted in landfill cap design and performed a HELP analysis.

Project Engineer; Determination of Area A Landfill Allowable Load; NSB New London; Groton, CT. Researched historic subsurface geotechnical investigations and evaluations to determine allowable loading on landfill over dredged spoil.

Project Engineer; Record of Decision for Operable Unit 2 – Site 6 Asphalt-capped Landfill Soil and Groundwater; NSB New London, Groton, CT. Prepared Record of Decision for Defense Reutilization and Marketing Office site. Seven years of groundwater monitoring were assessed in selecting the remedy for this

asphalt-capped landfill. Remedy includes institutional controls and monitoring.

Project Engineer; Second Five-Year Review of Three Asphalt-Capped Landfills for NSB New London; Groton, CT. Prepared Second Five-Year Review Report under CERCLA for 21 Installation Restoration Program sites to determine whether the remedies remain protective of human health and the environment. Developed site-specific inspection checklist for three asphalt-capped landfills and conducted site inspection. Evaluated up to five years of operation and maintenance and groundwater monitoring at three landfills.

Project Engineer; Landfill Remediation Cost Estimate for Operable Unit 10 (Site 7); NWS Earle; Colts Neck, NJ. Prepared cost estimate for remediation of a landfill. Alternatives included No Action; Limited Action; Single Barrier Cap, Institutional Controls and Long-Term Monitoring; Removal and Off-Site Disposal.

Design Engineer; Olsen Road Landfill Remedial Action Design Submittal at NDW Indian Head; Indian Head, MD. Assisted in the design of a multi-layer geosynthetic landfill cap, which includes topsoil, cover soil, geocomposite drainage layer (bonded geotextile and geonet), linear low density polyethylene geomembrane, and a gabion wall toe.

Project Engineer; Olsen Road Landfill Verification Sampling and Analysis Plan at NDW Indian Head; Indian Head, MD. This is a 2-acre landfill site used for disposal of construction and demolition debris and other solid wastes. Determined current testing requirements, optimized sampling plan, and planned field activities and sampling and analysis of soil for RCRA hazardous waste characteristics. Coordinated QA Project Plan and Health and Safety Plan.

Project Engineer; Landfill Capping for Former NSWC White Oak; Silver Spring, MD. The remedial action consisted of capping the site with a multi-layer low-permeability cover system and installing surface water controls. Interpreted groundwater and surface monitoring results to evaluate migration of chemicals of concern from the landfill to the surrounding areas and the effectiveness of the remedial action.

Design Engineer; Landfill Capping Design/Build RFP / Engineering Field Activity Northeast for NAS South Weymouth; Weymouth, MA. Preparation of cost estimates for a Design Build RFP package for use by the Navy to procure a contractor for remedial design and remediation services. Evaluated Pre-Design Investigation requirements, prepared settlement and stability analyses and cost estimates for capping of two landfills.

Project Engineer; EPA Landfill Consolidation and Capping Remedial Action Report for Berkley Products Site; Denver, PA. Assisted in preparation of a report documenting the consolidation and capping of a landfill.

Lead Design Engineer; 65%, 100%, and Final Landfill Design Submission, Contractor Submittals, and Post-Construction Long-Term Monitoring Plan for Former NSWC White Oak; Silver Spring, MD. Remedial design to regrade and cap areas containing contaminated soil, sediment, and waste, including PCBs and possible UXO. Investigated state-of-practice design methods for landfill covers, contacted geosynthetic manufacturers/suppliers, and incorporated state-of-practice materials and methods into design.

Project Engineer/Designer; Landfill Residual Waste Major Permit Modification, Liner System for a Confidential Utility Company; Western PA. Designed the liner system for a 112-acre, 270-foot high expansion area for residual waste disposal. Planned and supervised a geotechnical testing program; performed hydrologic evaluation of landfill performance (HELP) analyses and slope stability analyses (SLOPE/W); designed leachate collection, leak detection, and liner systems; and prepared the permit application and specifications.

RALPH H. BOEDEKER, PE
TECHNICAL ADVISOR
NEWARK, DELAWARE

EDUCATION: ME, Civil Engineering, University of Delaware, 1988
BS, Construction Engineering, Iowa State University, 1982

REGISTRATIONS: Registered Professional Engineer, Delaware (7789, 1989)
Registered Professional Engineer, Maryland (26156, 2001)
Registered Professional Engineer, Pennsylvania (PE-058805-E, 2001)
Registered Professional Engineer, Virginia (0402-36303, 2001).

TRAINING: OSHA 1910.120 40-Hour HAZWOPER Training (1989); 8-Hour Annual Refresher (2008)

PROJECT EXPERIENCE:

Project Manager; Kim Stan Landfill Closure Design; Selma, VA. Performed a remedial design for a 24-acre landfill, including the design of a multilayer soil and geosynthetic cap, methane gas management system and 1,250 feet long leachate collection trench. Design included engineering analysis of cap, cap reinforcing analysis on steep slopes, slope stability analysis, passive gas vent design, evaluation of bio-slurry construction techniques of leachate collection trench, and development of engineered wetlands to pretreat collected leachate. Currently managing remedial action construction of the leachate collection trench and landfill closure.

Project Engineer; Industrial Solid Waste Landfill Closure Design for a Confidential Pharmaceutical Manufacturing Facility. Planned and designed landfill cap system providing engineering analysis, details, and specifications for each of the cap's soil and geosynthetic constituents, as well as the gas collection/venting system. Performed global and cap slope stability analysis. The project work also included planning and field investigation work.

Project Manager; EPA Bush Valley Landfill Closure Design; Abington, MD. The project included capping of a 45-acre landfill, stormwater controls, perimeter and landfill gas collection and venting. Work included preparation of oversight health and safety plan, sampling and analysis plan, and technical oversight during pre-design field investigations including split-sampling, technical review of design submittals including a Remedial Design Work plan, and Preliminary, 30%, Prefinal and Final Design Documents, and the review of an O&M Plan. Tasked to perform technical oversight during construction of the landfill closure. Also performed construction field oversight and technical review submittals during construction.

Lead Project Engineer; East Mount Zion Landfill Closure Design; Springettsbury Township, PA. Responsibilities included closure of a 10+-acre landfill. Planned and designed the landfill cap system providing engineering analysis, slope design, settlement analysis and preparation of details and specifications for each of the cap's soil and geosynthetic constituents. Prepared project Design Analysis Report.

Project Engineer; Vandenberg AFB Solid Waste Landfill Closure Design; Vandenberg AFB. Responsibilities included preliminary design for closure of this solid waste landfill. Performed extensive slope stability analyses of large fill embankments and cut slopes. Designed gravity retaining walls and reinforced embankments to maximize landfill space, thereby extending the operating life of the landfill.

Program Manager; State of Delaware Landfill Capping as Part of Remediation Contract; New Castle, DE. Performed landfill capping services under the State of Delaware Hazardous Substance Control Act (HSCA) Remedial Management Services Contract.

Project Manager; Landfill Cap Design for the Healthways Site, State of Delaware Department of Natural Resources and Environmental Control, Healthways HSCA Site (Odessa, Delaware), 2000. Remedial design for this site included the planning and designing of a landfill cap system.

Lead Project Engineer; Russell Road Landfill Field Investigation and Design; MCCDC Quantico, VA. Responsibilities included field investigation, assessment and remedial design for off-site methane gas migration. Work also included field screening of vents and gas monitoring wells; geotechnical borings and laboratory testing of subsurface soils to characterize subsurface conditions; a soil gas field survey to determine the source, extent of migration, concentration, and direction of methane migration; an assessment of available landfill as built conditions; and recommendations/details for corrective action.

Project Geotechnical Engineer; Gardena Valley Landfills Closure Design; Carson, CA. Responsibilities included design of the landfill soil/geosynthetic cap system including slope stability analyses, settlement analyses, engineering analysis of various cap components and the preparation of design details and technical specifications.

Project Geotechnical Engineer; Design of 30-Acre Landfill Cap; McConnell AFB, KS. Responsible for the design of a 30 acre Subtitle D landfill cover system utilizing clay borrow excavated from an ongoing drainage improvement project.

Project Manager; Construction QA at Army Creek Landfill; New Castle, DE. Planned, directed, and managed construction, survey, and H&S QA services for the installation of a 45(+) acre landfill cap. Services included providing multi-disciplinary technical support on an as-needed basis and construction management support.

Project Manager, Construction QA at Tybout's Corner Landfill Superfund Site; New Castle, DE. Planned, directed, and managed construction, survey, and health and safety QA services for the installation of a 45(+) acre landfill cap, 3,125 feet long slurry trench, and the construction of a wastewater treatment facility.

Project Manager; Watson Johnson Landfill Remedial Investigation/Feasibility Study; Quakertown, PA. The project entailed management of 5 subcontractors as part of a field program consisting of the installation of over 35 monitoring wells, landfill delineation activities, landfill drum investigation, site surveying, landfill soil gas investigation, surface soil and surface water/sediment characterization of over 60 locations, groundwater sampling, ecological assessment, human health risk assessment and a comprehensive hydrogeologic assessment (including packer testing, geophysical logging and down hole flow measurements).

Project Manager; Lackawanna Refuse 5-Year Review of Landfill Site; Old Forge, PA. Performed an inspection and evaluation of a 40+-acre superfund landfill site to determine if the environmental remedy (landfill cap) continues to be protective of human health and the environment.

BIFF D. CUMMINGS, PE
TECHNICAL ADVISOR
PITTSBURGH, PENNSYLVANIA

EDUCATION: B.S., Civil Engineering, Pennsylvania State University 1978

REGISTRATIONS: Professional Engineer: West Virginia, 015871, 2004
Professional Engineer: Pennsylvania, PE 033238 E, 1984
Professional Engineer: Ohio, E-57675, 1994
Professional Engineer: Indiana, PE 10403586, 2004
Professional Engineer: Illinois, 062.059306, 2006
Professional Engineer: Alabama, 21197-E, 2005
National Council of Examiners for Engineers and Surveyors, 11655, 1993

TRAINING: OSHA 1910.120 40-Hour HAZWOPER Training (1983), 8-Hour Annual Refresher Training (2008), 8-Hour Supervisory Training, (1985)

PROJECT EXPERIENCE:

Project Manager/Engineer; Bayer Corporation South Landfill Closure Design and Remedial Action Work Plan; New Martinsville, WV. Prepared the design and Remedial Action Work Plan (RAWP) for the closure of the South Landfill (SWMU Group A) at Bayer Corporation's New Martinville, West Virginia Facility. Prepared a landfill cap design; designed a stormwater management and sedimentation and erosion control facilities, and; prepared the RAWP for submission to U.S. EPA and the West Virginia Division of Environmental Protection (WVDEP). The approximately 5-acre landfill contained wastes from past disposal operations at the plant system that, based on previous investigation, were impacting groundwater. Provided a cap design consisting of a multi-layer system utilizing a geomembrane, and geocomposite drainage materials.

Senior Project Manager; Edgewater Plant Solid Waste Landfill Design and Closure Requirements; Lorain, OH. Provided design and preparation of construction documents for the project which involved the design for the expansion of a 50-acre ash landfill. Performed evaluations to maximize disposal life, hydrologic and hydraulic analysis, geotechnical investigations and stability analyses, stormwater control through development of wetlands, and development of closure requirements. The final submittal for the project included drawings, specifications, operational requirements and construction cost estimates.

Senior Project Manager; Alcoa Rockdale Works Landfill Closure Design Caps; Rockdale, TX. Provided design of a 9-acre RCRA cap covering two spent potliner landfills. The design incorporated the use of bottom ash from the facilities coal-fired power plant as permeable material in the cap drainage layer.

Senior Project Manager; Anderson AFB Landfill 2 Cell Closure Design Plan; Guam. Responsible for the preliminary design and feasibility study of the project which involved the delineation of waste containment cells, preparation of preliminary plans and construction details, and a technical and economic feasibility analysis of several capping alternatives.

Task Manager; Vicon Sunderland Landfill Operational Plan and Closure. Prepared the Operational Plan for a 25-acre municipal waste incinerator ash landfill. Elements of the plan included waste handling and placement, surface water and leachate management, monitoring, contingency plans, and closure activities.

Project Manager/Engineer; Howmet Castings Landfill Closure Report; LaPorte, IN. Evaluated and Prepared a closure certification for the foundry waste landfill at the Howmet Castings Facility in LaPorte, Indiana. Provided subsurface investigation of the site consisting of 19 test borings, prepared a survey map, and a report for submission and approval to the Indiana Department of Environmental Management (IDEM).

Task Manager; Feasibility Study, NS Great Lakes, Sites 1 and 4 for U.S. Navy; Great Lakes, IL. Prepared a Feasibility Study for Site 1 – Golf Course Landfill and Site 4 – Fire Training Area at the Naval Station Great Lakes. The sites evaluated were at the location of a historic Base landfill which was closed in 1969. Wastes reported disposed in the landfill were typical of military landfills. Evaluated solutions including “No Action” along with waste removal, and a presumptive remedy in the form of a landfill cover system. Also evaluated as part of the feasibility study where options to relocate piping and open channels associated with the Skokie Ditch that traversed the property.

Senior Project Engineer; USACE RCRA Landfill Cap at Vint Hill Farms Station; Warrenton, VA. Provided design and construction support for the multi-layered RCRA landfill cap. The contaminants of concern encountered in seeps and groundwater at the site included semi-volatile organics and metals. In addition to the 5-acre geosynthetic cap, an erosional control system consisting of gabion baskets and revetment were designed and installed to protect the toe of the landfill and cap from the high seasonal flows of an adjacent tributary.

Senior Project Engineer; Aberdeen Proving Ground Old "O-Field" Landfill Area Support for USACE; Edgewood, MD. Provided multi-discipline design and construction support for the Permeable Infiltration Unit (PIU) cap and ancillary systems. Old O-Field was a landfill area used by the Army for storage, handling, disposal and destruction of chemical warfare materials, and decontaminating chemicals. It also contained white phosphorous along with exploded and unexploded ordnance. The unique PIU design consists of four components. These components include a blast resistant sand cover, an air monitoring system, a subsurface trickling system for the application of treatment solutions, and a surface sprinkler system including a 500,000 gallon water tank and emergency pump system. The entire system was designed to: mitigate the effects from exploding ordnance; detect the discharge of chemical agents; saturate the sand cover layer in order to suppress discharges from the cap. Due to the extreme hazards at the site, initial construction activities were, and were designed to be performed using radio controlled remotely operated earth moving equipment and onsite monitoring equipment.

Senior Project Manager; Herr's Island Landfill Cell Remediation Project for Urban Redevelopment Authority; Pittsburgh, PA. Provided design and construction management activities involving the construction of a 1.5-acre double-lined landfill cell and the removal and disposal PCB contaminated materials. Managed on-site personnel, project staffing, budgeting, invoicing, and client interface.

Senior Project Manager; Landfill Design Report. Prepared an expert report regarding design and construction of clay lined industrial waste landfill cells, and the appropriateness and effectiveness of remedial actions performed at the site under the NCP. Also investigated the causes of subsidence in a drainage pipe located beneath the cells.

Senior Technical Reviewer; Landfill Siting Study; Becancour, Quebec. Provided technical review for geotechnical investigation and assessment of foundation conditions for the project which included the preliminary geotechnical investigation and evaluation for two 400-acre landfill sites. Performed a subsurface exploration program, chemical and physical testing of soil samples, evaluated bearing capacities, potential settlements, and a report containing conclusions and recommendations for the development of the landfill.

**TIMOTHY S. EVANS, PG
SENIOR GEOLOGIST
PITTSBURGH, PENNSYLVANIA**

EDUCATION: B.S. Geology; Ohio University; 1991

**CERTIFICATIONS/
REGISTRATIONS:** Licensed Remediation Specialist; West Virginia; 211; 2007
Professional Geologist; Pennsylvania; PG-3727-E; 1999
Professional Geologist; South Carolina; 2221; 2000
Professional Geologist; Idaho; PG-1005; 2001
Certified Geologist; Maine; GE505; 2008

TRAINING: OSHA 1910.120 40-Hour HAZWOPER Training (1993), 8-Hour Annual Refresher Training (2008), 8-Hour Supervisory Refresher Training (2008)

PROJECT EXPERIENCE:

Project Manager/Project Geologist; Landfill Post-Remediation Operation, Maintenance and Monitoring Plan Revision for Portsmouth Naval Shipyard, Portsmouth, NH. Directs the revisions to the post-remedial operation, maintenance, and monitoring plan for the capped landfill at Operable Unit 3 at the Portsmouth Naval Shipyard. Also, provides direction for additional field monitoring events, and interprets hydrogeologic data.

Project Manager; Closed Landfill Groundwater Monitoring Activities for Naval Station Great Lakes; Great Lakes, IL. Manages the long-term groundwater monitoring activities at two closed landfills (Site 2-Forrestal Landfill and Site 3 – Supplside Landfill) using low-flow sampling techniques. Project involved quarterly monitoring of groundwater for multiple chemicals, including short-hold (48 hours or less) parameters. Required review of first four quarters of data collected from the previous contractor, and preparation of a summary annual report for first year of groundwater monitoring that interpreted the groundwater results and responded to the regulatory comments from the previous contractor. Groundwater reports (draft and final) are prepared for review by the Navy and regulators following each monitoring event.

Project Manager; RCRA Investigations for a Military Landfill and Waste Sites; NWS Charleston, SC. Managed a RCRA investigation and groundwater monitoring project at four sites, including a military landfill, former maintenance facility; a former underground storage tank and waste sump area; a former hazardous waste storage area; and a military landfill. Principal contaminants included chlorinated volatile organic compounds as well as hazards associated with disposed, unexploded ordinance. Secured regulatory approval for investigation in sensitive ecological habitat (i.e., tidal wetlands).

Hydrogeologist; Remedial Action for Landfill Cap for U.S. Navy; NSWC Dahlgren, VA. Modeled groundwater and contaminant transport for various metals and remedial scenarios for landfill cap design using VisualMODFLOW.

Project Geologist; Drilling and Installation of Monitoring Wells Along Landfills; Naval Subbase-New London, Groton, CT. Supervised drilling and monitoring well installation in unconsolidated soil and metamorphic bedrock, multi-media sampling activities, and aquifer testing for multiple sites in various phases of investigation over a four-year period. Developed a long-term groundwater monitoring plan following the implementation of a landfill remedial design. Supervised drilling and installation of monitoring wells along the edges of landfills in wetlands and along the river for long-term groundwater monitoring programs.

THOMAS A. GRAY, PE
TECHNICAL ADVISOR
PITTSBURGH, PENNSYLVANIA

EDUCATION: BS; Mining Engineering; Pennsylvania State University; 1973
MBA; Business Administration; University of Pittsburgh; 1977

REGISTRATIONS: Professional Engineer—Pennsylvania; 26978-E; 1978
Professional Engineer—Maryland; 17048; 1989
Professional Engineer—Virginia; 11628; 1980
Professional Engineer—West Virginia; 10523; 1988
Professional Engineer—Ohio; 73686; 2009

PROJECT EXPERIENCE:

Senior Technical Advisor; West Virginia DEP Fayette County Landfill; Fayette County, WV. Reviewed the design of a landfill closure project under the landfill closure programs.

Project Engineer; American Electric Power Solid Waste (FGD) Landfill Site Selection; Moundsville, WV. Completed a site selection evaluation of a new solid waste (FGD) landfill at a coal-fired electric generating facility. The site was underlain by coal that had been deep mined using room and pillar mining.

Project Engineer; Capels Resources, Inc. (Subsidiary to Berwind Corporation) Sanitary Landfill Project; McDowell County, WV. Performed a preliminary assessment of a site being proposed as a sanitary landfill.

Project Engineer; Chambers Development Corporation Municipal Waste Landfill Design and Permitting Services for Three Locations; Western PA. Provided design and permitting services for the three municipal waste landfills in western Pennsylvania. These locations included the Southern Alleghenies Landfill (Davidsville, Pennsylvania), the Monroeville Landfill (Monroeville, Pennsylvania), and the Arden Landfill (Washington County, Pennsylvania). Design of the closure of the landfill was included.

Project Manager; West Virginia Department of Environmental Protection, Office of Abandoned Mine Lands and Reclamation Abandoned Mine Portal Closure Projects; Lewis and Preston Counties, WV. Project Manager for the preparation of construction drawings to install wet mine seals and drainage improvements for the closure of abandoned mine portals on private property in Weston and Tunnelton West Virginia. Prepared construction specifications and construction cost estimate for the closure of nine mine portals.

Project Engineer; Inter-Power of New York, Inc. Liability Evaluation Associated with Leachate Collection; Colver, PA. Completed a potential environmental liabilities assessment of a large property. Evaluated the potential environmental liabilities associated with the purchase of a site that has runoff and leachate collection problems. Cost estimates for post-closure were prepared.

Senior Project Manager, Dominion Resources Solid Waste Disposal Site Investigation; St Paul, VA. Performed a siting investigation and a regulatory fatal flaw analysis for a potential solid waste disposal site in southwestern Virginia.

CHRISTOPHER R. NEUMANN
CONSTRUCTION MANAGER
PITTSBURGH, PENNSYLVANIA

EDUCATION: B.S., Civil Engineering Technology, University of Pittsburgh at Johnstown, 1993

TRAINING: OSHA 29 CFR 1910.120 40-Hour Health and Safety Training (1995), 8-Hour Management Supervisor Training (1998), 8-Hour General Site Worker Refresher and Supervisor Refresher Training (2008), OSHA 29 CFR 1926 30-Hour Construction Safety & Health Training (1998), Subpart P Trenching and Excavation Competent Person Training (1999)

PROJECT EXPERIENCE:

Project Engineer; Design & Construction of Above-Ground Landfill; Fernald, OH. As a result of the RI/FS for contaminated soils the chosen remedy for remediation was to design and build an above-ground landfill on site for containment of all low-level radioactive soil, buried debris, and building demolition debris. Prepared planning documents, including work plans for safety, quality assurance, erosion and sediment control, stormwater management, and sampling, cost estimates, technical specifications, and design drawings. Performed quantity takeoffs, engineering calculations and analysis, procurement of subcontractors, and provided construction supervision. Prepared design and construction documents for the site preparation phase of construction for an aboveground, low-level radioactive material landfill, including excavation plan, erosion and sediment control plan, and technical specifications. Also, aided in establishing the design criteria for the second phase of construction. Provided construction inspection services reporting construction progress, compliance with plans and specifications and preparation of design change notices. Integrated multiple projects during design to sequence construction and prevent redundancy between current and future projects.

Project/Field Engineer; Design of Barrier Layer Cover System for Inactive Landfill; MCCDC Quantico, VA. Provided technical support throughout the design of a barrier layer cover system for an inactive, 23-acre landfill. Responsibilities included design of E&S control plan, subcontractor interface, and cost analysis. Prepared technical specifications and assisted in preparation of construction drawings. Design of the barrier layer cover system included excavation and offsite disposal of polychlorinated biphenyl (PCB) contaminated soils, clearing and grubbing, landfill regrading, wetland mitigation/replacement, and an aggregate parking area. Also involved in field reconnaissance to further characterize contamination and delineate extent of landfill.

Project/Field Engineer; Implementation Plan for Remediation of Inactive Landfill Site; MCAS Cherry Point, NC. Acted as draft author of the Implementation Plan for remediation of the MCAS, Cherry Point, Operable Unit 3, Sites 6 and 7, preparing budget and schedule estimates with management oversight. OU3 contained PCB-contaminated soils within an inactive landfill. Performed field investigation to determine extent of contamination by collecting soil samples using hand auger and stainless-steel trowel methods and collecting groundwater samples by installing geoprobe temporary well points.

Construction Manager; NASA; RCRA KARS Park Skeet Range Pilot Scale Study; Kennedy Space Center, FL. Five grids were selected for treatment and an additional four grids containing leachable lead concentrations less than the acceptable TCLP limit were selected for excavation and disposal at a municipal landfill. Following receipt of confirmation sample analysis from treated grids, 4,500 cubic yards was transported for disposal at a landfill. Also responsible for daily operations, scheduling, direction of subcontractors, and heavy equipment operation.

TIMOTHY W. SMITH, PE
PROJECT ENGINEER
PITTSBURGH, PENNSYLVANIA

EDUCATION: BS; Civil Engineering Technology; University of Pittsburgh; 1990

REGISTRATIONS: Professional Engineer, Pennsylvania (Civil), #PE-050626-E, 1997
Professional Engineer, Maine (Civil), 11862, 2009
National Council of Examiners of Engineers and Surveyors (NCEES); 26951; 2005

TRAINING: OSHA 1910.120 40-Hour HAZWOPER Training; June 1991
OSHA 1910.120 8-Hour Annual Refresher Training; December 2008

PROJECT EXPERIENCE:

Project Engineer; 1400 Area Landfill Closure Design; NSWC Dahlgren, VA. Prepared the 100% and Final Closure Design Submittals and wetland mitigation plan. Field work included verification sampling, attending QA/QC meetings, collection of verification samples, and participating in the final walk through meeting. During construction duties included submittal review and change/variance request review. The project involves a landfill soil cap/phyto-remediation system, and excavation of contaminated sediments. Design includes waste consolidation, Terramodel earth work, wetland mitigation, erosion and sedimentation control calculations, storm water runoff calculations, pond storage calculations, wire sizing calculations, facility controls, and planting calculations for wetlands and phyto-remediation process.

Project Engineer; Old South Side Landfill Design; NWS Charleston, SC. Responsible for the preparation of a preliminary design of a hybrid landfill cover system and an evaluation of alternative remedies for a 15 acre landfill area located within the tidal flats of Goose Creek. The hybrid cover was developed to limit the change in tidal flat elevation and to avoid excavation within a landfill known to contain unexploded ordnance. The preliminary landfill cover consists of 7 acres of marine mattresses designed to be placed directly on top of the existing tidal flat to provide stabilization of the existing landfill cover soils and prevent further exposure of landfill material, a 7 acre upland cover that consists of a conventional soil cover, and a 1 acre transition area that is constructed of marine mattresses, conventional soils, and armor stones.

Project Engineer; Design/Build RFP for West Gate Landfill and Rubble Disposal Area; NAS South Weymouth, MA. Prepared a Design Build RFP for two landfill areas. The schematic design included preparation of specifications, summary of Federal and State regulations, cover system design, grading and site restoration. The project involved providing a schematic design that included re-grading of waste material located both within and outside the limits of the existing landfills, and installation of soil caps over the two landfill areas.

Project Engineer; Final Removal Design for Two Landfill Sites; NSWC Dahlgren, VA. Prepared the 60%, 100%, and Final Removal Design submittals including wetland mitigation plans for the removal of two abandoned landfill areas where construction debris have been disposed and covered with soil. Fieldwork has included site condition assessment, determination of lateral extent of contamination, and utility verification. The design includes waste excavation and disposal, earth work, preparation of construction specifications, wetland mitigation, erosion and sedimentation control calculations, facility controls, planting calculations for wetlands, and site restoration.

Project Engineer; Town Gut Landfill Final Remediation Action Design; NSWC Indian Head, MD. Prepared the 65%, 100%, and Final Remedial Action Design Submittals and a Verification Sampling and Analysis Plan. Project

included wetland mitigation plans and the closing a construction debris landfill with a soil cover. Fieldwork included site condition assessment, determination of lateral extent of landfill, and utility location/verification. The project involved the re-grading of existing waste and cover soil and placement of a two-foot thick soil cap over the prepared grade.

Project Engineer; Olson Road Landfill Design; NSWC Indian Head, MD. Prepared the 65%, 100%, Remedial Action Design Submittals including wetland mitigation plans for closing a construction debris landfill with an engineered impermeable landfill cap. Design includes the relocation of water lines used for fire suppression, fire alarm lines, and communications lines. Fieldwork has included site condition assessment, topographic and site feature survey, determination of lateral extent of landfill, and utility location/verification. The project involved the re-grading of existing waste and cover soil and placement of a 2 ½ -foot thick engineered impermeable cap over the prepared grade. Options for complete landfill removal have been incorporated into a revised design document.

Project Engineer; Goss Cove Landfill Cap Design, NSB New London; Groton, CT. Prepared the 100% Remedial Design Submittal and Bidding Document Submission for a landfill cap and culvert relocation design. The project involved designing an engineered cap system consisting of geosynthetics and soils and replacing a series of three 36-inch diameter drainage pipes with one 4 by 10 foot pre-cast concrete box culvert to provide storm water drainage for 1/3 of the Naval Submarine Base. The length of the culvert is approximately 380 feet and the landfill cap is approximately 6 acres. During construction duties included review, reviewing information requests and reviewing variance requests.

Civil Engineer; Feasibility Study for Two Landfill Sites; NSWC Indian Head, MD. Co-authored Feasibility Study for two landfill sites and a facility storage/handling pad. Contaminated media includes surface soils, subsurface soils, sediment, surface water and groundwater. Obstacles include above ground high temperature steam lines and wetlands. Estimated combined size of sites is approximately 10 acres. Remedial alternatives developed included multiple landfill capping options, and excavation with off-site disposal.

Civil Engineer; Soil Landfill Cap Design for a Confidential Client; Hearts Mountain, NJ. Design of soil landfill cap to act as a barrier between potential inhabitants of the site. Cap design included use of impermeable clay layers, certified clean fill layer and a vegetative soil layer.

Civil Engineer; Soil Cap Design for a Military Landfill; Guam. Design of a soil cap for a military landfill classified as a municipal waste landfill. Cap design included grading and placement of geosynthetic materials and a two-foot layer of coral.

Project Engineer; Feasibility Study for the Capping of a Landfill for a Confidential Government Client; VA. Mr. Smith has prepared a feasibility study for the capping of a landfill. Tasks included researching regulations, cost estimating of materials and field work, and scheduling required activities for completion of project.

Civil Engineer; Feasibility Studies for Costing of Alternative Landfill Cap and Excavation Alternatives Picatinny Arsenal; NJ. Provided feasibility study support on three environmental sites located with the property of Picatinny Arsenal. These feasibility studies include costing alternative landfill cap and excavation alternatives for the remediation and closure of two sites, and completing research on natural attenuation for a groundwater plume at a third.

ANDREW L. STRASSNER, PE
CONSTRUCTION QA/QC
PITTSBURGH, PENNSYLVANIA

EDUCATION: B.S., Environmental Systems Engineering, Penn State University, 2003

REGISTRATIONS: Professional Engineer, Pennsylvania, 2008
Wastewater System Operator, Pennsylvania, 2007
Stormwater Management Inspector, Florida, 2007

TRAINING: OSHA 1910.120 40-Hour HAZWOPER Training; (2003), OSHA 1910.120 8-Hour Supervisory Training (2004), OSHA 1910.120 8-Hour Annual Refresher Training (2008)

PROJECT EXPERIENCE:

Environmental Engineer; Feasibility Study for Former Golf Course Landfill; NS Great Lakes, IL. Prepared a Feasibility Study report using presumptive remedy guidance for military landfills, which included capping, monitoring, and institutional control components. Responsible for drafting FS report, determining Applicable or Relevant and Appropriate Requirements and To Be Considered Criteria, and preparing a detailed analysis of remedial alternatives.

Staff Engineer; Evaporation System Monitoring to Treat Landfill Leachate for a Confidential Client; Muscle Shoals, AL. Assisted with the management of a solar evaporation system designed to treat landfill leachate from an industrial landfill in northern Alabama. Responsibilities include weekly correspondence with site operators, preparation of weekly status reports, interpretation of transducer data, modeling of treatment design options, and preparing/modifying standard O&M procedures.

Engineer; Design/Construction of Landfill Cap and Leachate Collection System Installation; Muscle Shoals, AL. Assisted with design and construction of a leachate collection system, gas collection system, and cap for a 55-acre landfill. Was responsible for preparing the site stormwater management plan, preparing *Best Management Practices* (BMP) permit documents, and performing/checking landfill slope-stability calculations. Field responsibilities included working with surveyors to verify sub-grade elevations for landfill liner and drainage layers, performing weekly BMP inspections, and ensuring compliance with site design and permit requirements.

Construction QA/QC Engineer; NASA KARS Park Skeet Range Interim Measures/Closure; Kennedy Space Center, FL. Oversight of Interim Measures (IM) activities conducted to address hazardous soils based on TCLP lead concentrations. Field responsibilities included oversight of daily operations, supervision of subcontractors, preparation of project documents, and operation of heavy equipment. Post-construction responsibilities include the preparation of closure documents, wetland inspection reports, and the IM Completion Report. IM activities included a soil treatment process that was accomplished in four steps: pre-excavation/stockpiling, addition and mixing of a phosphate-based liquid additive, addition and mixing of kiln dust, and confirmation sampling.

QA/QC Construction Engineer; Soil Remediation Project; Utica, NY. Oversight of construction and groundwater treatment activities related to remediation of a former coal tar processing plant. Activities included implementation of erosion control measures, excavation of tar-laden soil and subsequent backfilling with clean material, management and onsite treatment of site groundwater, and off-site disposal of both hazardous and non-hazardous materials. Responsibilities included ensuring compliance with the approved soil remedial design, sampling of soil and treated site groundwater, reviewing contractor cost reports, managing disposal manifests, and supervising in the operation of the onsite water treatment plant.

**DANIEL C. WITT, PE
PROJECT ENGINEER
PITTSBURGH, PENNSYLVANIA**

EDUCATION: B.S., Civil Engineering, The Pennsylvania State University, 1987

REGISTRATIONS: Professional Engineer, Pennsylvania, 1993

TRAINING: OSHA 1910.120 40-Hour Health and Safety Training (1992), 8-Hour Annual Refresher Training; February (2008), 8-Hour Supervisory Training; February (2008)

PROJECT EXPERIENCE:

Project Manager; Final Design for Closure of 7-Acre Landfill, Site 17 at NSWC Dahlgren Site; Dahlgren, VA. Project Manager for the design of the closure of a 7 acre landfill. The design employs phyto-remediation to act as an equivalent hydraulic barrier to a solid waste landfill cap.

Lead Engineer; Landfill Cap Closure Design at NS Annapolis; Annapolis MD. Coordinated development of design packages to close this 38-acre site. Project involves capping and consolidation of an approximately 9 acres of landfill. The project included wetland delineation, geotechnical field investigation, site work.

Project Engineer; Closed Landfill Gas Migration Mitigation Plan at Site 17 NSF; Dahlgren, VA. Prepared a landfill gas migration mitigation plan for this closed landfill. Mitigation plan included compiling and summarizing years of landfill gas investigations results, evaluating gas migration pathways and proposing gas mitigation measures.

Design Engineer; EPA Butz Landfill Superfund Site; Jackson Township, PA. Design of additional groundwater extraction piping and pumps for an existing groundwater pump and treatment system at this landfill site.

Project Manager; Remedial Designs for Landfill and Waste Areas, Sites 6 and 46; NSF Dahlgren, VA. Project manager for this task order which involved the design of two soil removal action at former waste disposal areas.

Project Manager; Landfill Cap Design for Sites 2 and 9 at NSWC Dahlgren; Dahlgren, VA. Project manager for this task order which involved the design of three separate final design packages including design of a landfill cap over a UXO burial area and a landfill cap partially located within a tidal marsh with very soft soil conditions.

Project Manager; EPA Landfill Cap Construction and Remedial Design/Action Oversight; Neville Island, PA. Provided third party oversight assistance for the remedial design, construction, and long-term monitoring of a Superfund site in Pennsylvania. The remedial action included the construction of a multilayer landfill cap at the site.

Project Engineer; NWS Earle Landfill Cap Design for Sites 4 and 5; Colts Neck, NJ. Coordinated final design (included multilayer caps at two sites) of two landfill caps including pre-design investigations, preparation of drawings, specifications, cost estimates, Design Basis report, Environmental Permits report, and E&S Control Plan.

Engineer; Area A Landfill Design at NSB New London; Groton CT. Performed stability analyses for the construction of a low permeability cap on an existing landfill.

Project Engineer; Dominion Power Feasibility Study for CCB Landfill; Clover, VA. Served as the task lead for a feasibility study to relocate permitted storm water outfalls from the CCB landfills at this coal fired power plant.

STATE OF WEST VIRGINIA
Purchasing Division**PURCHASING AFFIDAVIT****VENDOR OWING A DEBT TO THE STATE:**

West Virginia Code §5A-3-10a provides that: No contract or renewal of any contract may be awarded by the state or any of its political subdivisions to any vendor or prospective vendor when the vendor or prospective vendor or a related party to the vendor or prospective vendor is a debtor and the debt owed is an amount greater than one thousand dollars in the aggregate.

PUBLIC IMPROVEMENT CONTRACTS & DRUG-FREE WORKPLACE ACT:

If this is a solicitation for a public improvement construction contract, the vendor, by its signature below, affirms that it has a written plan for a drug-free workplace policy in compliance with Article 1D, Chapter 21 of the **West Virginia Code**. The vendor **must** make said affirmation with its bid submission. Further, public improvement construction contract may not be awarded to a vendor who does not have a written plan for a drug-free workplace policy in compliance with Article 1D, Chapter 21 of the **West Virginia Code** and who has not submitted that plan to the appropriate contracting authority in timely fashion. For a vendor who is a subcontractor, compliance with Section 5, Article 1D, Chapter 21 of the **West Virginia Code** may take place before their work on the public improvement is begun.

ANTITRUST:

In submitting a bid to any agency for the state of West Virginia, the bidder offers and agrees that if the bid is accepted the bidder will convey, sell, assign or transfer to the state of West Virginia all rights, title and interest in and to all causes of action it may now or hereafter acquire under the antitrust laws of the United States and the state of West Virginia for price fixing and/or unreasonable restraints of trade relating to the particular commodities or services purchased or acquired by the state of West Virginia. Such assignment shall be made and become effective at the time the purchasing agency tenders the initial payment to the bidder.

I certify that this bid is made without prior understanding, agreement, or connection with any corporation, firm, limited liability company, partnership or person or entity submitting a bid for the same materials, supplies, equipment or services and is in all respects fair and without collusion or fraud. I further certify that I am authorized to sign the certification on behalf of the bidder or this bid.

LICENSING:

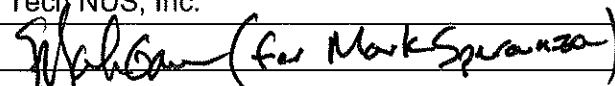
Vendors must be licensed and in good standing in accordance with any and all state and local laws and requirements by any state or local agency of West Virginia, including, but not limited to, the West Virginia Secretary of State's Office, the West Virginia Tax Department, West Virginia Insurance Commission, or any other state agencies or political subdivision. Furthermore, the vendor must provide all necessary releases to obtain information to enable the Director or spending unit to verify that the vendor is licensed and in good standing with the above entities.

CONFIDENTIALITY:

The vendor agrees that he or she will not disclose to anyone, directly or indirectly, any such personally identifiable information or other confidential information gained from the agency, unless the individual who is the subject of the information consents to the disclosure in writing or the disclosure is made pursuant to the agency's policies, procedures and rules. Vendor further agrees to comply with the Confidentiality Policies and Information Security Accountability Requirements, set forth in <http://www.state.wv.us/admin/purchase/privacy/noticeConfidentiality.pdf>.

Under penalty of law for false swearing (**West Virginia Code** §61-5-3), it is hereby certified that the vendor affirms and acknowledges the information in this affidavit and is in compliance with the requirements as stated.

Vendor's Name: Tetra Tech NUS, Inc.

Authorized Signature:  (for Mark Spvanza) Date: August 10, 2009