ACKENHEIL
ENGINEERS
GEOLOGISTS

Ackenheil Engineers and Geologists, Inc.
P.O. Box 416
Hub Industrial Park
Nitro, West Virginia 25143
Phone (304) 755-8228
Fax (304) 755-8229
www.ackenheilwv.com

September 18, 2008

Department of Administration
Purchasing Division
2019 Washington Street, East
P.O. Box 50130
Charleston, WV 25305-0130

Attention: Mr. Chuck Bowman

Subject: RFQ DEP14390
Island Creek #18 Mine Complex Design

Ladies and Gentlemen:

The attached document is Ackenheil Engineers and Geologists' response to the Department of Environmental Protection, Office of Abandoned Mine Lands and Reclamation's request for proposals to provide services relative to the subject project arising from abandoned mine lands in West Virginia.

In accordance with Section 1.9.2 we are submitting one original, plus one copy, which present the qualifications of Ackenheil Engineers and Geologists, Inc. Contained with our proposal are the required forms of R.F.Q. Requisition No. DEP14390. The name, signature, telephone number and title of the person authorized to conduct negotiations and contractually sign for our organization appears in this introductory letter.

We will be pleased to answer any questions which you may have regarding our proposal, and will meet with you at your convenience. We are looking forward to working with the West Virginia Department of Environmental Protection, Office of Abandoned Mine Lands and Reclamation.

Very truly yours,

ACKENHEIL ENGINEERS & GEOLOGISTS, INC.

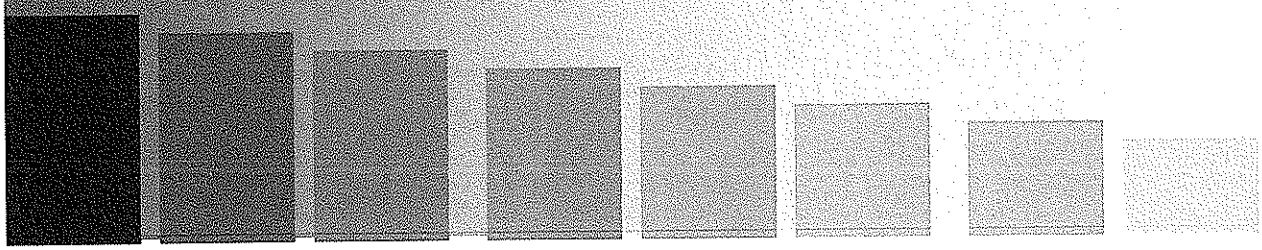
Edward L. Robinson, P.E., P.S.
Principal Engineer
(304) 755-8228

TABLE OF CONTENTS

A

Island Creek #18 Mine Complex

- Request for Quotation Form



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	PAGE
DEP14390	1

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

VENDOR
RFQ COPY
TYPE NAME/ADDRESS HERE
Ackenheil Engineers and Geologists, Inc.
Hub Industrial Park
P.O. Box 416
Nitro, WV 25143

SHIP TO
ENVIRONMENTAL PROTECTION
DEPARTMENT OF
OFFICE OF AML&R
601 57TH STREET SE
CHARLESTON, WV
25304 304-926-0499

DATE PRINTED	TERMS OF SALE	SHIP VIA	F.O.B.	FREIGHT TERMS
08/21/2008				

BID OPENING DATE: 09/23/2008 BID OPENING TIME 01:30PM

LINE	QUANTITY	UOP	CAT NO.	ITEM NUMBER	UNIT PRICE	AMOUNT
0001	1	JB		906-29		

ISLAND CREEK #18 MINE COMPLEX DESIGN

EXPRESSION OF INTEREST

THE WEST VIRGINIA PURCHASING DIVISION, FOR THE AGENCY, THE WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION, IS SOLICITING EXPRESSIONS OF INTEREST FOR PROFESSIONAL ENGINEERING DESIGN SERVICES AND CONSTRUCTION MONITORING SERVICES AT THE ISLAND CREEK #18 MINE COMPLEX PROJECT IN LOGAN CO, WEST VIRGINIA, PER THE FOLLOWING BID REQUIREMENTS AND ATTACHED SPECIFICATIONS.

BANKRUPTCY: IN THE EVENT THE VENDOR/CONTRACTOR FILES FOR BANKRUPTCY PROTECTION, THIS CONTRACT IS AUTOMATICALLY NULL AND VOID AND IS TERMINATED WITHOUT FURTHER ORDER.

SEE REVERSE SIDE FOR TERMS AND CONDITIONS

SIGNATURE	TELEPHONE	DATE
	(304)755-8228	9-23-08

TITLE	FEIN	ADDRESS CHANGES TO BE NOTED ABOVE
Principal Engineer	55-0518043	

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

Island Creek #18 Mine Complex

- Affidavit

B

RFQ No. DEP14390

028

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:
West Virginia Code §21-1D-5 provides that: Any solicitation for a public improvement construction contract shall require each vendor that submits a bid for the work to submit at the same time an affidavit that the vendor has a written plan for a drug-free workplace policy in compliance with Article 1D, Chapter 21 of the West Virginia Code. A 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. Vendors should visit **www.state.wv.us/admin/purchase/privacy** for the Notice of Agency Confidentiality Policies.

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

Vendor's Name: Ackenheil Engineers and Geologists, Inc.

Authorized Signature: _____ Date: 9-23-08

Island Creek #1
Mine Complex

- Signature Page

RFQ #DEP14391

Island Creek #18 Mine Complex

ACKENHEIL ENGINEERS AND GEOLOGISTS, INC.
P.O. BOX 416
HUB INDUSTRIAL PARK
NITRO, WEST VIRGINIA 25143

PERSON AUTHORIZED TO CONDUCT NEGOTIATIONS AND CONTRACTUALLY BIND OUR FIRM:

NAME: EDWARD L. ROBINSON, PRINCIPAL ENGINEER

SIGNATURE:

TELEPHONE NUMBER: (304) 755-8228

Island Creek #1
Mine Complex

- AML Consultant Confid
Qualification Questionn
Attachment "B"

D

WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION
AML CONSULTANT CONFIDENTIAL QUALIFICATION QUESTIONNAIRE

Attachment "B"

PROJECT NAME	DATE (DAY, MONTH, YEAR)	FEIN
Island Creek #18 Mine Complex	18, September, 2008	55-0518043

1. FIRM NAME	2. HOME OFFICE BUSINESS ADDRESS	3. FORMER FIRM NAME
Ackenheil Engineers and Geologists, Inc.	P.O. Box 416, HUB Industrial Park Nitro, WV 25143	Ackenheil and Associates West Virginia, Inc.

4. HOME OFFICE TELEPHONE	5. ESTABLISHED (YEAR)	6. TYPE OWNERSHIP	6a. WV REGISTERED DBE (Disadvantaged Business Enterprise)
(304) 755-8228	1969	Individual — Corporation X Partnership — Joint-Venture	YES — NO X

7. PRIMARY AML DESIGN OFFICE: ADDRESS/ TELEPHONE/ PERSON IN CHARGE/ NO. AML DESIGN PERSONNEL EACH OFFICE

P.O. Box 416, HUB Industrial Park / (303) 755-8228 / Edward L. Robinson, P.E., P.S. / 8
Nitro, West Virginia 25143

8. NAMES OF PRINCIPAL OFFICERS OR MEMBERS OF FIRM	8a. NAME, TITLE, & TELEPHONE NUMBER - OTHER PRINCIPALS
Edward L. Robinson, P.E., P.S. - Principal Engineer Richard W. Watts, P.G. - Vice President	

9. PERSONNEL BY DISCIPLINE

1 ADMINISTRATIVE	— ECOLOGISTS	— LANDSCAPE ARCHITECTS	— STRUCTURAL ENGINEERS
— ARCHITECTS	— ECONOMISTS	— MECHANICAL ENGINEERS	— **SURVEYORS**
— **BIOLOGIST**	— ELECTRICAL ENGINEERS	1 **MINING ENGINEERS**	— TRAFFIC ENGINEERS
1 **CADD OPERATORS**	— ENVIRONMENTALISTS	— PHOTOGRAMMETRISTS	1 OTHER (Drillers)
— CHEMICAL ENGINEERS	— ESTIMATORS	— PLANNERS: URBAN/REGIONAL	
2 **CIVIL ENGINEERS**	2 **GEOLOGISTS**	— SANITARY ENGINEERS	
— CONSTRUCTION INSPECTORS	— HISTORIANS	— SOILS ENGINEERS	
— DESIGNERS	— HYDROLOGISTS	— SPECIFICATION WRITERS	8 TOTAL PERSONNELL
— DRAFTSMEN			

TOTAL NUMBER OF WV REGISTERED PROFESSIONAL ENGINEERS IN PRIMARY OFFICE: 2 .
***RPEs other than Civil and Mining must provide supporting documentation that qualifies them to supervise and perform this type of work.**

10. HAS THIS JOINT-VENTURE WORKED TOGETHER BEFORE? ☐ YES ☐ NO

11. OUTSIDE KEY CONSULTANTS/SUB-CONSULTANTS ANTICIPATED TO BE USED. Attach "AML Consultant Confidential Qualification Questionnaire".

NAME AND ADDRESS:	SPECIALTY:	WORKED WITH BEFORE _____ Yes _____ No
NAME AND ADDRESS:	SPECIALTY:	WORKED WITH BEFORE _____ Yes _____ No
NAME AND ADDRESS:	SPECIALTY:	WORKED WITH BEFORE _____ Yes _____ No
NAME AND ADDRESS:	SPECIALTY:	WORKED WITH BEFORE _____ Yes _____ No
NAME AND ADDRESS:	SPECIALTY:	WORKED WITH BEFORE _____ Yes _____ No
NAME AND ADDRESS:	SPECIALTY:	WORKED WITH BEFORE _____ Yes _____ No
NAME AND ADDRESS:	SPECIALTY:	WORKED WITH BEFORE _____ Yes _____ No
NAME AND ADDRESS:	SPECIALTY:	WORKED WITH BEFORE _____ Yes _____ No

12. A. Is your firm experienced in Abandoned Mine Lands Remediation/Mine Reclamation Engineering?

(YES) Description and Number of Projects: Since 1983 - 66 Projects for WVDEP & OAML &R

NO

B. Is your firm experienced in Soil Analysis?

(YES) Description and Number of Projects: Since 1974 - Over 2600 Projects

NO

C. Is your firm experienced in hydrology and hydraulics?

(YES) Description and Number of Projects: Since 1983 - 56 Projects for WVDEP & OAML &R

NO

D. Does your firm produce its own Aerial Photography and Develop Contour Mapping?

YES Description and Number of Projects:

(NO) We subcontract aerial mapping but perform in-house field survey mapping.

E. Is your firm experienced in domestic waterline design? (Include any experience your firm has in evaluation of aquifer degradation as a result of mining.)

(YES) Description and Number of Projects: Since 1996 - 7 Projects for WVDEP & OAML &R

NO

F. Is your firm experienced in Acid Mine Drainage Evaluation and Abatement Design?

(YES) Description and Number of Projects: Since 1983 - 43 Projects for WVDEP & OAML &R

NO

13. PERSONAL HISTORY STATEMENT OF PRINCIPALS AND ASSOCIATES **RESPONSIBLE FOR AML PROJECT DESIGN** (Furnish complete data but keep to essentials)

NAME & TITLE (Last, First, Middle Int.)	YEARS OF EXPERIENCE		
	YEARS OF AML DESIGN EXPERIENCE:	YEARS OF AML RELATED DESIGN EXPERIENCE:	YEARS OF DOMESTIC WATERLINE DESIGN EXPERIENCE:
Edward L. Robinson Principal Engineer	39	39	

Brief Explanation of Responsibilities

Mr. Robinson has provided multi-disciplined professional services utilizing the latest technology in the design of highways, bridges, structures, environmental, civil, and geotechnical projects as well as global position satellite surveying, right-of-way, construction inspection and architectural services.

EDUCATION (Degree, Year, Specialization)

B.S./1969/Civil Engineering M.S./1981/Civil Engineering

MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS	REGISTRATION (Type, Year, State)
ASCE, NSPE	P.E. Civil Engineer/1978/West Virginia, Kentucky, Ohio, Pennsylvania, North Carolina, South Carolina, Virginia, Georgia, Maryland, Colorado P.S. Surveying/West Virginia

13. PERSONAL HISTORY STATEMENT OF PRINCIPALS AND ASSOCIATES **RESPONSIBLE FOR AML PROJECT DESIGN** (Furnish complete data but keep to essentials)

NAME & TITLE (Last, First, Middle Int.)	YEARS OF EXPERIENCE		
	YEARS OF AML DESIGN EXPERIENCE:	YEARS OF AML RELATED DESIGN EXPERIENCE:	YEARS OF DOMESTIC WATERLINE DESIGN EXPERIENCE:
Watts, Richard W. Vice President, Project Geologist	25	31	5

Brief Explanation of Responsibilities

Mr. Watts has served as project geologist on more than fifty abandoned mine lands projects. His experience has included many aspects of these projects ranging from field reconnaissance to drilling coordination, from laboratory testing to technical analysis, from specification writing to quantity determinations, and from making cost estimates to conducting prebid meetings. He has served as Project Geologist on 7 AML waterline feasibility studies.

EDUCATION (Degree, Year, Specialization)

B.S./1977/Geology
M.S./1994/Geography

MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS	REGISTRATION (Type, Year, State)
GSA, AEG	P.G. Geology/1992/Virginia P.G. Geology/1993/Kentucky

13. PERSONAL HISTORY STATEMENT OF PRINCIPALS AND ASSOCIATES **RESPONSIBLE FOR AML PROJECT DESIGN** (Furnish complete data but keep to essentials)

NAME & TITLE (Last, First, Middle Int.)	YEARS OF EXPERIENCE		
	YEARS OF AML DESIGN EXPERIENCE:	YEARS OF AML RELATED DESIGN EXPERIENCE:	YEARS OF DOMESTIC WATERLINE DESIGN EXPERIENCE:
Pratt, Scott A. Geologist	9	9	4

Brief Explanation of Responsibilities

His primary responsibility has been serving as Field Geologist, which includes drilling supervision and coordination, soil and rock core identification, property owner coordination, geologic reconnaissance, preparing drilling geologic logs. He has worked on 21 AML projects including six (6) Waterline extension feasibility projects. He has a very good knowledge of drilling operations having served both as driller and driller assistant.

EDUCATION (Degree, Year, Specialization)

B.S./1999/Geology

MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS	REGISTRATION (Type, Year, State)
	WVDOH Certified Compaction Inspector WVDOH Certified Aggregate Sampler

13. PERSONAL HISTORY STATEMENT OF PRINCIPALS AND ASSOCIATES **RESPONSIBLE FOR AML PROJECT DESIGN** (Furnish complete data but keep to essentials)

NAME & TITLE (Last, First, Middle Int.)	YEARS OF EXPERIENCE		
	YEARS OF AML DESIGN EXPERIENCE:	YEARS OF AML RELATED DESIGN EXPERIENCE:	YEARS OF DOMESTIC WATERLINE DESIGN EXPERIENCE:
Workman, Gary A. Computer Aided Draftsman Senior Technician, Surveyor Assistant	19	19	5

Brief Explanation of Responsibilities

Mr. Workmans primary duty is serving as a computer aided draftsman. Additionally he serves as a senior technician performing and supervising laboratory and field testing services. In combination with his computer aided drafting, he generally served as surveyor assistant. He has worked on 44 WVDEP AML projects of which 27 involved computer aided drafting and 7 were waterline feasibility studies.

EDUCATION (Degree, Year, Specialization)

Technical School/1987/CADD

MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS	REGISTRATION (Type, Year, State)
	WVDOH Certified Compaction, Aggregate and Portland Inspector

13. PERSONAL HISTORY STATEMENT OF PRINCIPALS AND ASSOCIATES **RESPONSIBLE FOR AML PROJECT DESIGN** (Furnish complete data but keep to essentials)

NAME & TITLE (Last, First, Middle Int.)	YEARS OF EXPERIENCE		
	YEARS OF AML DESIGN EXPERIENCE:	YEARS OF AML RELATED DESIGN EXPERIENCE:	YEARS OF DOMESTIC WATERLINE DESIGN EXPERIENCE:
Begley, Richard D. Mining Engineer	5	5+	0

Brief Explanation of Responsibilities

He has worked with Ackenheil Engineers and Geologists, Inc. on thirteen (13) mining related projects. This work included mine subsidence prediction and remediation, landslides, rock slope stability, mine opening reclamation, and landslide computer simulation.

EDUCATION (Degree, Year, Specialization)

B.S./1980/Mining Engineering M.S./1984/Mining Engineering Ph.D/1990/Mining Engineering

MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS	REGISTRATION (Type, Year, State)
Society of Mining Engineers WV Coal Mining Institute	E.I./1996/West Virginia

13. PERSONAL HISTORY STATEMENT OF PRINCIPALS AND ASSOCIATES **RESPONSIBLE FOR AML PROJECT DESIGN** (Furnish complete data but keep to essentials)

NAME & TITLE (Last, First, Middle Int.)	YEARS OF EXPERIENCE		
	YEARS OF AML DESIGN EXPERIENCE:	YEARS OF AML RELATED DESIGN EXPERIENCE:	YEARS OF DOMESTIC WATERLINE DESIGN EXPERIENCE:
Lyle, Seth C. Civil Engineer	<1	4+	0

Brief Explanation of Responsibilities

Mr. Lyle's primary task will be to provide civil engineering support in regard to geotechnical, hydrology, and hydraulics. He has obtained relatively extensive experience in slope stability analysis serving with U.S. Army Corps of Engineers Geotechnical Branch. His AML experience came with part-time employment with Ackenheil Engineers and Geologists, Inc. during undergraduate educational recesses.

EDUCATION (Degree, Year, Specialization)

B.S./2001/ Geology with Engineering Emphasis
B.S./2002/Civil Engineering

MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS	REGISTRATION (Type, Year, State)
	P.E. Civil Engineer/2007/West Virginia

14. PROVIDE A LIST OF SOFTWARE AND EQUIPMENT AVAILABLE IN THE PRIMARY OFFICE WHICH WILL BE USED TO COMPLETE AML DESIGN SERVICES		
Software:		
1. AutoCAD 2007	19. StormCad	37. Ruvolum 7.0 – TECCO System Design
2. AutoCAD Lt 2002	20. WaterCad	
3. MicroStation SE	21. North American Green 4.3	
4. Eagle Point Civil Engineering Software (2 licenses)	22. Aquachem	
5. Microsoft Word 2002 and 2003	23. HeliCAP, Soil Screw Retention System	
6. Microsoft Excel 2000	24. SNAILZWIN, Soil Nail Reinforcement	
7. WordPerfect 9.0	25. Anchor Wall, Segmental Wall Design	
8. Quattro Pro 9.0	26. MagMap 2000	
9. Microsoft Publisher	27. Spile, Ultimate Static Capacity of Piles	
10. Microsoft PowerPoint 2002	28. FTGBC, Bearing Capacity of Spread Footings	
11. PCSTABL Slope Stability Program	29. FTGSETT, Settlement Analysis	
12. HydroFlow Hydrographs 6.02	30. RETWALL, Cantilever Retaining Walls	
13. Flowmaster	31. SCHMERT, Settlement of Spread Footings	
14. StormCad	32. SHAFT, Drilled Shaft Foundations	
15. HEC-HMS 3.1.0	33. WEAP87, Wave Analysis of Pile Foundations	
16. HEC-RAS, Channel Analysis	34. COMP624P, Piles and Drilled Shafts	
17. HEC-1, Flood Hydrograph	35. SF254/255 Reporter	
18. HEC-2, Water Surface	36. Accounting Program (QuickBooks)	

14. PROVIDE A LIST OF SOFTWARE AND EQUIPMENT AVAILABLE IN THE PRIMARY OFFICE WHICH WILL BE USED TO COMPLETE AML DESIGN SERVICES

Geotechnical Laboratory & Field Equipment:

Equipment to perform the following tests:

- Mechanical Analysis, Sieve Analysis, Hydrometer Analysis
- Liquid and Plastic Limits
- Unconfined Rock and Soil Compression Tests
- Direct Shear Test
- Consolidation Test
- Moisture Content
- Density of Shelby Tube Samples
- Specific Gravity
- Permeability
- Standard and Modified Proctors
- California Bearing Ratio
- Rock Sodium Sulfate Test
- L.A. Abrasion
- Sliding Rock Core Friction
- Shrinkage Limits
- Triaxial Compression
- Rock Splitting Tensile Strength
- Aggregate Gradation

Field Equipment:

- Two (2) 3440 Troxler Nuclear Densometers
- Hand Auger & Dynamic Cone Penetrometer
- Monitoring Well Sampler
- Water Level Indicator
- Brunton Compass
- Altimeter
- HACH Colorimeter
- pH Meter
- Total Dissolved Solids Meter
- Hygrometer/Temperature Meter

Concrete Laboratory & Field Equipment:

Concrete Compression Test Machine - 300,000 lb. capacity
Concrete Core Drilling Machine
Lapidary Saw
Slump Test Equipment
Air Entrainment Test Equipment
Cylinder Molds and Caps

Surveying Equipment:

Leica TC305 Total Station
Tripods, Rods, Etc.

Office Technical and Clerical Equipment:

Five (5) IBM Compatible Computers
HP Laser Jet 1200 Series Printer
Two (2) HP Deskjet 5150 Printers
HP Deskjet 9650 Printer
HP Deskjet 6940 Printer
HP Designjet 800 Color Plotter
Toshiba 2540 Copy Machine
Canon Faxphone B95 Fax Machine
Planix Digital Planimeter
Light Table

Library:

Company and personal libraries containing several hundred volumes
Nearly complete set of West Virginia Geological Survey County Reports and Maps

14. PROVIDE A LIST OF SOFTWARE AND EQUIPMENT AVAILABLE IN THE PRIMARY OFFICE WHICH WILL BE USED TO COMPLETE AML DESIGN SERVICES

Drilling Equipment:

Mobile B-30 mounted on a Ford Super Duty 2wd truck
Acker AD-2 of F-600 2wd truck
F-250 Heavy Duty 4 x 4 pickup support truck w/ pipe rack and extra fuel tank
Mobile TriLoc and Diedrich 3 ¼" hollow stem augers
CME 2 ¼" hollow stem augers
NX and NQ2 wireline core barrels (5' and 10') w/ rods
3" split spoon
2" split spoon
AW drill rods
Tri-cone roller bit
Split-spoon samplers
Shelby tube samplers
Bean skid-mounted EO4 Series Quadraplex water pump
Tremie pipe
1000+ ft ¾" waterline
210 gallon water tank
500 gallon water tank
Assorted hand tools
Miscellaneous drilling supplies (hoisting plugs, adapters, etc.)

15. CURRENT ACTIVITIES ON WHICH YOUR FIRM IS THE DESIGNATED ENGINEER OF RECORD

PROJECT NAME, TYPE AND LOCATION	NAME AND ADDRESS OF OWNER	NATURE OF YOUR FIRM'S RESPONSIBILITY	ESTIMATED CONSTRUCTION COST	PERCENT COMPLETE
Crane Creek Refuse Piles Mercer County, WV	West Virginia DEP 601 57th St., SE Charleston, WV 25304	Prepare plans and Specifications for reclamation. Attend and document prebid and pre-construction meetings.	$732,115	99%

TOTAL NUMBER OF PROJECTS: 1

TOTAL ESTIMATED CONSTRUCTION COSTS: $732,115

16. CURRENT ACTIVITIES ON WHICH YOUR FIRM IS SERVING AS A SUB-CONSULTANT TO OTHERS

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

17. COMPLETED WORK WITHIN LAST 5 YEARS ON WHICH YOUR FIRM WAS THE DESIGNATED ENGINEER OF RECORD				
PROJECT NAME, TYPE AND LOCATION	NAME AND ADDRESS OF OWNER	ESTIMATED CONSTRUCTION COST	YEAR	CONSTRUCTED (YES OR NO)
Access Road Remediation Landslide Movement Huntington, West Virginia	VA Medical Center 1540 Spring Valley Drive Huntington, West Virginia 25704	$377,410	2006	Yes
WVDEP Carswell Eroding Refuse Carswell, West Virginia	West Virginia DEP 601 57th St., SE Charleston, WV 25304	$3,048,044	2006	Yes
WVDEP Craigmoor (Strader) Landslide Emergency Craigmoor, West Virginia	West Virginia DEP 601 57th St., SE Charleston, WV 25304	$609,031	2004	Yes
WVDEP Ames (Clare) Landslide U.S. Parks Landslide Emergency New River Gorge Ames, West Virginia	West Virginia DEP 601 57th St., SE Charleston, WV 25304	$127,729	2007	Yes
WVDEP Skin Creek Phase II Wyoming County, West Virginia	West Virginia DEP 601 57th St., SE Charleston, WV 25304	$721,000	2003	Yes
WVDEP Witcher Creek Belle, West Virginia	West Virginia DEP 601 57th St., SE Charleston, WV 25304	$956,000	2005	Yes
WVDEP Nutter Fort Mine Drainage Nutter Fort, West Virginia	West Virginia DEP 601 57th St., SE Charleston, WV 25304	$437,000	2004	Yes
Praxair, Inc. Proposed Railcar Saf-T System Pedestal Foundation Design Marmet, West Virginia	Praxair, Inc. 175 East Park Drive Tonawanda, NY 14156	$90,000 (Foundation System Only)	2005	Yes

18. COMPLETED WORK WITHIN LAST 5 YEARS ON WHICH YOUR FIRM HAS BEEN A SUB-CONSULTANT TO OTHER FIRMS (INDICATE PHASE OF WORK FOR WHICH YOUR FIRM WAS RESPONSIBLE)

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
Air Shaft Sealing BPB Facility WV Route 2 at Fish Creek Rd Marshall County, WV	McElroy Coal Co. RD 4 Box 425 Moundsville, WV 26041	$50,000	2006	Yes	S&ME Spartansburg, SC
AEP Caretta Substation Geotechnical Engineering Caretta, WV	American Electric Power 1281 N. Electric Avenue Roanoke, VA 24019	$100,000	2006	No	Pentree, Inc. Princeton, WV
AEP McGraws Substation Geotechnical Engineering McGraws, WV	American Electric Power 1281 N. Electric Avenue Roanoke, VA 24019	$200,000	2006	Yes	Pentree, Inc. Princeton, WV
Landslide Remediation Gauley River PSD Little Elk Water Tank Nicholas County, WV	Gauley River PSD P.O. Box 47 Swiss, WV 26690	$120,000	2006	Yes	Pentree, Inc. Princeton, WV
Water Treatment Plant Geotechnical Engineering Services WYCO Water Project Wyoming County, WV	Eastern Wyoming PSD P.O. Box 506 Logan, WV 25601	$500,000	2005	Yes	Pentree, Inc. Princeton, WV
Elevated Water Storage Geotechnical Engineering Services Weirton, WV	Weirton Water Board 200 Municipal Plaza Weirton, WV 26062	$150,000	2005	Yes	Thrasher Engineering, Inc. Charleston, WV

19. Use this space to provide any additional information or description of resources supporting your firm's qualifications to perform work for the West Virginia Abandoned Mine Lands Program.

We propose to subcontract aerial mapping to Photo Science. If bat studies have not been previously performed, we propose to subcontract that investigation to Biologist Teresa Sydney Burke of Alliance Consulting, Inc. If environmentally hazardous materials are part of the project, we propose to subcontract their evaluation to Enviroprobe Integrated Solutions, Inc. We also propose to supplement our drilling capabilities by using Enviroprobe, if necessary. Information regarding these potential subcontractors, whom we have worked with before, follows.

20. The foregoing is a ~~statement of facts~~.

Signature: _____ Title: Principal Engineer Date: 9-23-08

Printed Name: Edward L. Robinson, P.E., P.S.

Island Creek #18 Mine Complex

- AML and Related Project Experience Matrix
Attachment "C"

AML and RELATED PROJECT EXPERIENCE MATRIX

WVDEP PROJECT	Exp. Basis C= Corp P=Personal *	Additional Info Provided in Section (s) **	PROJECT EXPERIENCE																PRIMARY STAFF PARTICIPATION/CAPACITY *** M=Management P=Professional						
			Abandoned Surface Mine Reclamation	Abandoned Deep Mine Reclamation	Portal/Shaft Closure	Hydrologic/Hydraulic Design/Eval.	Remining Evaluation	Mine/Refuse Fire Abatement	Subsidence Investigation Mitigation	Hazardous Waste Disposal	Project Specifications	Water Quality Evaluation/Mitigation/ Replacement	Construction Inspection/ Management	Water Treatment	Equipment/Structure Removal	Stream Restoration	Geotechnical Stability	Craig A. Lyte	Richard W. Watts	Jim P. Smiley	Christoper D. Mays	Scott A. Pratt	Richard D. Begley	Gary A. Workman
Little Fork	C,P	1983	X	X	X	X	X	X			X					X	X	M,P	P					
Elkridge Refuse	C,P	1984	X	X	X	X	X	X			X				X		X	M,P	P					
Lando Mines	C,P	1984	X	X	X	X					X						X	M,P	P					
West Varney	C,P	1984		X	X	X					X						X	M,P	P					
Bethel Portals	C,P	1985		X	X	X					X	X					X	M,P	P					
Mammoth Landslide	C,P	1985				X					X			X	X		X	M,P	P					
Cheyenne	C,P	1985	X			X					X	X		X	X		X	M,P	P					
Mudlick A Landslide	C,P	1985	X		X	X					X	X				X	X	M,P	P					
Nelson Landslide	C,P	1985	X	X							X						X	M,P	P					
Mudlick B Refuse	C,P	1985	X	X	X	X	X				X				X	X	X	M,P	P					
Bluff Mountain	C,P	1985	X	X	X	X	X				X	X			X	X	X	M,P	P					
Montgomery Drainage	C,P	1986		X	X	X					X			X			X	M,P	P					
Mayoros Drainage	C,P	1986		X	X	X					X	X		X				M,P	P					
Ridgeview A & B	C,P	1987	X	X	X	X	X	X			X	X		X	X		X	M,P	P					
Tupper Valley	C,P	1987	X	X	X	X					X	X		X			X	M,P	P					
Airport Bottom	C,P	1987		X	X	X					X	X						M,P	P					
Manilla Creek	C,P	1987	X	X	X	X	X				X	X		X	X		X	M,P	P					

* List whether project experience is corporate or personnel based or both.

** Use this area to provide specific sections or pages if needed for reference.

*** List Primary Design personnel and their functional capacity for the projects listed.

Attachment "C"

AML and RELATED PROJECT EXPERIENCE MATRIX

WVDEP PROJECT	Exp. Basis C= Corp P=Personal *	Additional Info Provided in Section (s) **	PROJECT EXPERIENCE																PRIMARY STAFF PARTICIPATION/CAPACITY *** M=Management P=Professional						
			Abandoned Surface Mine Reclamation	Abandoned Deep Mine Reclamation	Portal/Shaft Closure	Hydrologic/Hydraulic Design/Eval.	Remining Evaluation	Mine/Refuse Fire Abatement	Subsidence Investigation Mitigation	Hazardous Waste Disposal	Project Specifications	Water Quality Evaluation/Mitigation/ Replacement	Construction Inspection/ Management	Water Treatment	Equipment/Structure Removal	Stream Restoration	Geotechnical Stability	Craig A. Lyle	Richard W. Watts	Jim P. Smiley	Christoper D. Mays	Scott A. Pratt	Richard D. Begley	Gary A. Workman
Big Sandy	C,P	1987	X			X		X			X				X			M,P	P					
Marfrance	C,P	1988	X	X	X	X					X	X						M,P	P					
New Hill Ballpark	C,P	1988	X	X	X	X	X				X	X						M,P	P					
Jones Run	C,P	1988	X	X	X	X			X		X	X			X		X	M,P	P					
Chapmanville Landslide	C,P	1989		X	X	X					X						X	M,P	P					P
Wharncliff Landslide	C,P	1989		X	X	X					X						X	M,P	P					P
Joyce Sturm	C,P	1990		X	X	X					X	X		X				M,P	P				P	P
Marianna Refuse	C,P	1991	X			X	X				X						X	M,P	P	P			P	P
Cedar Grove	C,P	1991		X	X	X					X	X		X			X	M,P	P	P			P	P
Eskdale	C,P	1991		X	X	X					X			X	X			M,P	P	P			P	P
Hodgesville	C,P	1991	X	X	X	X					X	X		X			X	M,P	P	P				P
Newsome Branch	C,P	1992	X	X	X	X	X				X				X		X	M,P	P	P			P	P
Morrison	C,P	1992		X	X	X					X	X					X	M,P	P	P				P
Snake Island	C,P	1993	X			X	X	X			X				X	X		M,P		P				
Orchard Branch	C,P	1994	X	X	X	X	X				X	X		X			X	M,P	P	P	P			P
Beckley Layne	C,P	1994		X	X	X					X	X					X	M,P	P	P	P			P
Quinwood Booth	C,P	1994		X	X	X			X		X	X						M,P	P	P	P			P

* List whether project experience is corporate or personnel based or both.

** Use this area to provide specific sections or pages if needed for reference.

*** List Primary Design personnel and their functional capacity for the projects listed.

AML and RELATED PROJECT EXPERIENCE MATRIX

WVDEP PROJECT	Exp. Basis C= Corp P=Personal *	Additional Info Provided in Section (s) **	PROJECT EXPERIENCE															PRIMARY STAFF PARTICIPATION/CAPACITY *** M=Management P=Professional						
			Abandoned Surface Mine Reclamation	Abandoned Deep Mine Reclamation	Portal/Shaft Closure	Hydrologic/Hydraulic Design/Eval.	Remining Evaluation	Mine/Refuse Fire Abatement	Subsidence Investigation Mitigation	Hazardous Waste Disposal	Project Specifications	Water Quality Evaluation/Mitigation/ Replacement	Construction Inspection/ Management	Water Treatment	Equipment/Structure Removal	Stream Restoration	Geotechnical Stability	Craig A. Lyle	Richard W. Watts	Jim P. Smiley	Christoper D. Mays	Scott A. Pratt	Richard D. Begley	Gary A. Workman
Lorado	C,P	1995	X	X	X	X					X	X			X		X	M,P	P	P	P			P
Madeline Refuse	C,P	1995	X	X	X	X	X			X	X				X	X	X	M,P	P	P	P			P
Rocklick	C,P	1995	X	X	X	X					X						X	M,P	P	P	P			P
Wahoo	C,P	1996	X			X	X	X			X				X		X	M,P	P	P	P			P
Meadowbrook	C,P	1996	X	X	X	X	X				X	X			X		X	M,P	P	P	P			P
Jumping Branch	C,P	1996										X						M,P	P		P			P
Beard's Fork	C,P	1997	X	X	X	X	X	X		X	X				X			M,P	P	P	P			P
Turkey Wallow	C,P	1997	X	X	X	X	X	X			X						X	M,P	P	P	P			P
Otsego	C,P	1997	X	X	X	X	X				X				X		X	M,P	P	P	P			P
Miller	C,P	1997	X	X	X	X					X	X						M,P	P	P	P			P
Whitby	C,P	1998	X	X	X	X					X	X		X	X	X	X	M,P	P	P	P			P
Barker	C,P	1999	X	X	X	X					X	X						M,P	P	P	P	P		P
Gauley River Road	C,P	1999										X						M,P	P	P	P	P		P
Skin Creek	C,P	2000	X	X	X	X	X				X	X			X	X	X	M,P	P	P	P	P		P
Jolo	C,P	2001										X						M,P	P	P	P	P		P
Tioga	C,P	2001										X						M,P	P	P	P	P		P
Turkey Gap	C,P	2001	X	X	X	X					X				X	X		M,P		P	P	P		P

* List whether project experience is corporate or personnel based or both.

** Use this area to provide specific sections or pages if needed for reference.

*** List Primary Design personnel and their functional capacity for the projects listed.

Attachment "C"

AML and RELATED PROJECT EXPERIENCE MATRIX																									
			PROJECT EXPERIENCE																PRIMARY STAFF PARTICIPATION/CAPACITY *** M=Management P=Professional						
WVDEP PROJECT	Exp. Basis C= Corp P=Personal *	Additional Info Provided in Section (s) **	Abandoned Surface Mine Reclamation	Abandoned Deep Mine Reclamation	Portal/Shaft Closure	Hydrologic/Hydraulic Design/Eval.	Remining Evaluation	Mine/Refuse Fire Abatement	Subsidence Investigation Mitigation	Hazardous Waste Disposal	Project Specifications	Water Quality Evaluation/Mitigation/ Replacement	Construction Inspection/ Management	Water Treatment	Equipment/Structure Removal	Stream Restoration	Geotechnical Stability	Craig A. Lyle	Richard W. Watts	Jim P. Smiley	Christoper D. Mays	Scott A. Pratt	Richard D. Begley	Gary A. Workman
Leslie(Nelson)	C,P	2002	X	X	X	X	X				X	X	X					M,P	P	P	P	P		P
Swiss Drennan	C,P	2002										X						M,P	P	P	P	P		P
Minden C	C,P	2002	X	X	X	X	X			X	X				X			M,P	P	P	P	P		P
Weston	C,P	2002										X						M,P	P	P	P	P		P
Parkette	C,P	2002							X			X					X	M,P	P	P	P	P		P
East Dupont Avenue Landslide	C,P	2003		X	X	X					X						X	M,P	P	P	P	P		P
Skin Creek Phase II	C,P	2003	X			X					X				X	X	X	M,P	P	P	P	P		P
Witcher Creek	C,P	2001		X	X	X					X		X				X	M,P	P	P	P	P		P
Crane Creek	C,P	2004	X		X	X	X				X	X				X	X	M,P	P	P	P	P		P
Yoursco	C,P	2004	X	X	X							X						M,P	P	P	P	P		P
Carswell	C,P	2004	X			X	X				X		X		X	X	X	M,P	P	P	P	P		P
Craigmoor	C,P	2004				X					X		X				X	M,P	P	P	P	P		P
Downey Pierpont	C,P	2006							X								X	M,P	P			P		P
Ames (Clare) Landslide	C,P	2007		X							X						X	M,P	P			P		P
Prenter Road/Route	C,P	2008										X						M,P	P			P		P

* List whether project experience is corporate or personnel based or both.

** Use this area to provide specific sections or pages if needed for reference.

*** List Primary Design personnel and their functional capacity for the projects listed.

Island Creek #18 Mine Complex

- Executive Summary

EXECUTIVE SUMMARY

ACKENHEIL ORIGINALLY ESTABLISHED - 1958

OUR NITRO OFFICE HAS BEEN UNDER PRESENT LEADERSHIP SINCE 1974

ANNUAL CONSULTANT TO WVDEP SINCE 1983

COMPLETED 66 ABANDONED MINE LAND PROJECTS FOR WVDEP

EXPERTISE IN SOILS, ROCK, GEOTECHNICAL, CIVIL ENGINEERING, GEOLOGY, MINING, HYDROGEOLOGY, HYDROLOGY, RECLAMATION, GEOGRAPHY, LAND USE, TESTING, SUBSIDENCE, SURVEYING AND MAPPING, DRILLING, ECOLOGY

EQUIPPED SOIL, ROCK, AGGREGATE, AND CONCRETE LABS

EQUIPPED DRILLING RIGS AND SUPPORT VEHICLE

Island Creek #18 Mine Complex

- Introduction and Company History

INTRODUCTION
AND
COMPANY HISTORY

Ackenheil and Associates was established in Pittsburgh, Pennsylvania by Dr. Alfred C. Ackenheil in 1958 for the purpose of offering services in civil engineering, soil mechanics, and geology.

Continued growth of the firm throughout the 1960's and 1970's resulted in the establishment of branch offices in the Appalachian and East Coast regions. What is now Ackenheil Engineers and Geologists, Inc. was established in 1969.

Our principal fields of expertise include geotechnical and civil engineering, geologic and mining studies, hydrology and hydrogeology, land use, environmental science, soil mechanics, and construction testing services. We have extensive experience in projects dealing with foundation systems, landslides, construction quality control, site feasibility and development, and geotechnical aspects of the mining and chemical industries. The technical capabilities of our personnel are supported by our well-equipped soil, rock, and concrete testing laboratory facilities.

We have been blessed to have been involved with the West Virginia Department of Environmental Protection Abandoned Mine Land Program since its inception in 1983, working on 66 projects. We have also accomplished a number of emergency reclamation projects for the Federal Office of Surface Mining, Reclamation and Enforcement. In addition, we have continued to act as a consultant to the private sectors on mining related issues such as subsidence, landslides, blasting, highwall design, and slope stability, and various aspects of rock and coal mechanics for mining purposes.

It is our goal to continue to serve the West Virginia Department of Environmental Protection, and to provide professional, innovative solutions to West Virginia's Abandoned Mine Land problems.

Island Creek #18 Mine Complex

- Key Personnel Resumes

H

Edward L. Robinson, P.E., P.S.
President

Education

M.S. Civil Engineering
University of West Virginia, (COGS), 1981

B.S. Civil Engineering
West Virginia Institute of Technology, 1969

Registrations

Registered Professional Engineer in West Virginia, Kentucky, Ohio, Pennsylvania, North Carolina, South Carolina, Virginia, Georgia, Maryland and Colorado.

Registered Professional Surveyor in West Virginia.

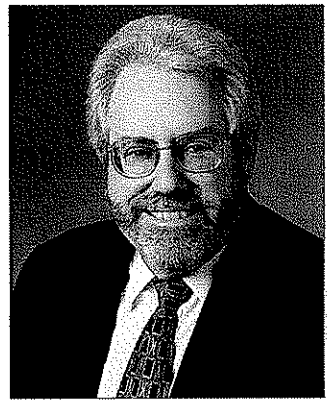
Professional Memberships

- American Society of Civil Engineers
- National Society of Professional Engineers

Professional Experience

Mr. Robinson founded E. L. Robinson Engineering Co. in 1978 with four employees. Initially the firm provided land surveying and land development services.

Under his leadership, E. L. Robinson has entered the new millennium as a multi-disciplined professional services firm that



utilizes the latest technology in the design of highways, bridges, structures, environmental, civil, and geotechnical projects as well as global position satellite surveying, right-of-way, construction inspection and architectural services.

The firm now employs more than 90 engineers, architects, surveyors and support personnel and has been converted to an employee owned company through an Employee Stock Ownership Plan (ESOP).

Representative Projects

Engineering Review of the following projects:

- **US Route 52 – Kermit Bypass:** This project consisted of 2.5 miles of four-lane divided highway, 3,000 LF of four-lane access road design, two 4-ramp intersections, one set of twin structures, one single bridge, and 2,900 LF of stream relocation, all of which resulted in 10 million cubic yards of excavation and an estimated total construction cost of $88 million.

- **Corridor H – Davis to Bismark:** This project consisted of 1.75 miles of four-lane divided highway, one bridge, two at-

grade intersections, and a 6′ x 6′ concrete box culvert. This project has an estimated total construction cost of $9 million.

- **Corridor H – Foreman to Moorefield:** This project consisted of 5 miles of four-lane divided highway, almost 3 miles of access road design, a truck escape ramp, one set of twin structures, one single bridge, a box culvert, and naturalized stream design. This project resulted in 10 million cubic yards of excavation and an estimated construction cost of $75 million.

- **CAMC 33rd Street Relocation:** Engineering design and construction management for the relocation of 33rd street and site development for a five story clinical teaching facility in Charleston, WV.

Offices Held

- Current Member of West Virginia University Board of Governors
- Current Chairman of WVUIT Advisory Board
- President of West Virginia Council of Engineering Companies
- Chairman Transportation Committee – WV Association of Consulting Engineers
- State Director of West Virginia Society of Professional Engineers
- President of West Virginia Society of Professional Engineers
- Assistant Treasurer of the American Society of Civil Engineers
- National Director of the ASCE representing WV, NC, SC and VA
- President of West Virginia Section of ASCE

Honors Awarded

- Honorary PhD, *Doctor of Science* – West Virginia Institute of Technology 2002
- Engineering Entrepreneur of the Year – Ernst & Young, 2001
- National Entrepreneur of the Year Finalist – Ernst & Young, 2001
- Engineer of the Year – American Society of Civil Engineers, 1998
- Engineer of the Year – West Virginia Society of Professional Engineers, 1997
- Alumnus of the Year – West Virginia University Institute of Technology, 1992

RICHARD W. WATTS

Education:

B.S. Geology, Marshall University, 1977

M.S. Geography, Marshall University, 1994

Registration:

Registered Professional Geologist in Virginia and Kentucky

Professional Organizations:

Association of Engineering Geologists
Geological Society of America

Teaching Experience:

Instructor, 1998 - Marshall University
Engineering Geology Program
Soil and Rock Mechanics

Background:

Mr. Watts joined Ackenheil in 1977 and presently serves as Senior Geologist. He is vice-president of the firm and assists in the general operation and administration. He has worked on hundred of projects involving geology, civil and geotechnical engineering, mining, and construction.

Mr. Watts is primarily an engineering geologist whose range of project experience has encompassed numerous projects concerning geologic investigation, rock and soils engineering, landslides, land reclamation, forensic damage investigations, hydrogeology, hydrology and hydraulics, and the coal industry.

He has had extensive field experience involving geologic site reconnaissance, test boring drilling and oversight, core evaluation, field instrumentation, soil and water sample collection and testing, magnetometer surveys, and construction inspection.

He is also instrumental in literature research, proposal preparation, design computations, and report writing, including conclusions, recommendations, specifications and design drawings.

Experience as Related to AML Work:

(1) **Hydrogeology**: Mr. Watts has experience on various types of projects involving hydrogeologic studies, including a number of AML water line studies. Other AML related projects have included over forty-eight inundated mines which posed blow-out threats to local residences. He has also installed groundwater monitoring wells and pneumatic piezometers in coal refuse embankments. In addition, he has performed in-situ permeability tests using wellpoints placed in coarse and fine coal refuse. Mr. Watts has also used dye tracing to determine subsurface flow conditions. One interesting project involved a groundwater and surface water study to determine whether AML drainage was impacting a lake used as a drinking water reservoir.

(2) **Environment, Ecology and Natural Resources**: Mr. Watts has performed extensive research on environmental and ecological issues relating to human-induced impacts on the natural environment. He is knowledgeable about ecological principles, and ecosystem development and processes. Mr. Watts is familiar with the genesis and continuing transformation of environmental law, with particular emphasis on the National Environmental Policy Act and its application. He has reviewed numerous environmental impact statements, and many of the documents from the Council on Environmental Quality. Other environmental projects have included landfill permitting, NPDES permitting, underground storage tank removal, and water and waste treatment facilities.

(3) **Land Use and Resource Planning**: Mr. Watts has traveled extensively examining land use and natural resource planning. He has examined post reclamation land use in West Virginia, Kentucky, and Colorado. He has performed land use and environmental assessments which entailed examination of existing and past land use, including recreational, historical, and archeological facets, as well as critical habitats for endangered or threatened species. Mr. Watts' graduate work entailed over two years of land use investigation, resulting in the production of the first detailed land use maps of the forty square mile Teays Valley area in West Virginia.

(4) **Geology and Coal Resources**: Geologically oriented projects have included geologic reconnaissance of many kinds of sites such as coal refuse piles, collapsed mine openings and potential and existing landslide areas. In addition, he was the project geologist on a coal resource study for which he was responsible for the test boring layout over a 60,000 acre area, coordination of drilling activities, and collection, organization and interpretation of all field data. Other mining related work includes coal seam mineability studies, mine permitting, highwall stability analyses, roof and floor analyses, and slurry pond design.

(5) **Backfilling and Grading**: Mr. Watts has extensive field experience with backfilling and grading operations. He has performed testing using both nuclear and sand cone density methods on numerous projects encompassing a variety of backfilling materials such as soil, shale, and flyash. In addition, he is experienced in the design phase of earthwork operations, and total site cut and fill balancing. He also serves as our Nuclear Radiation Safety Officer in charge of our nuclear density equipment.

(6) **Engineering Geology**: Mr. Watts' engineering geology experience has included numerous projects involving soils, foundations, landfills and landslides. Many landslides have been AML related in origin for which he has been responsible for installing field monitoring instrumentation such as slope indicators and wellpoints. Mr. Watts has performed hundreds of slope stability analyses for landslide reclamation and other slopes. He has served as project geologist on numerous and varied foundation projects involving pile driving, caisson installation, earth fill placement, subsurface exploration, site reconnaissance, grout and concrete placement and quality control. He has also been responsible for designer/contractor liaison, checking for conformance to specifications, estimates for contractor payments, and maintaining documentation including photographic records.

(7) **Subsidence**: Mr. Watts has been project geologist on numerous mine subsidence projects involving both existing and potential subsidence. These projects included both damage investigations and proposed construction projects. His duties have included direction of the exploratory drilling program, logging of samples, ground water monitoring, roof-rock analysis, and structure analysis. He has also participated in the laboratory testing of the strata overlying the coal seam, and has been instrumental in the design of the subsidence abatement measures. This included numerous flow cone tests for grout mix design.

Publications:

Development on Marginal Land-Implications for Land Use Planning,
6th Biennial Conference on Appalachian Geography Conference Proceedings, 1992.

Land Use in the Teays Valley Growth Corridor, Marshall University, Masters Thesis, 1994.

Land Use in the Teays Valley Growth Corridor, Home Builder News, Putnam County Home Builders Association, 1996.

RICHARD D. BEGLEY

Education:

A.S., Mining Engineering Technology, West Virginia Institute of Technology, 1978.

B.S., Mining Engineering Technology, West Virginia Institute of Technology, 1980.

M.S., Engineering of Mines, West Virginia University, 1984.

Ph.D., Mining Engineering, West Virginia University, 1990.
Specialization: Ground Control/Rock Mechanics.

Certifications:

West Virginia Underground Mine Foreman

Engineer Intern, The State Board of Registration for Professional Engineers of West Virginia #6730;1996.

Instructor, Underground and Surface Mine Safety and Health Administration and WV Office of Miners' Health, Safety & Training

Dust Sampler Underground and Surface Mine Safety and Health Administration

Professional Organizations:

(1)Society of Mining Engineers (National Education Committee Member 1990 - Present)

(2)Engineers Club of Huntington (Board Member)

(3)Kanawha Valley Mining Institute (Board Member)

(4)WV Coal Mining Institute (Vice President)

Awards:

Faculty Achievement Award - Fairmont State College (Fall 1989)

Background:

Dr. Begley joined Ackenheil in April 1990 and has worked on thirteen different projects. His primary responsibility is to serve as a consultant as a Mining Engineer on subsidence design projects. He also serves as Associate Director of Research and Development at the Transportation Center at Marshall University and as Professor in Engineering at Marshall University.

Dr. Begley was an Assistant Professor of Technology at Fairmont State College for five years. His responsibilities were primarily with the Mining Engineering Technology Program (A.S. and B.S.). Classes included: Mining Methods Safety and laws, Coal Mine Environment and Ground Control, Advanced Mining, Coal Preparation, Energy Processes (Clean Coal Technology), and Mine Mapping and Surveying. Other classes were taught in: Electronics, Safety (OSHA) and Graphics.

Experience as Related to AML Work:

(1) **Geotechnical**: Dr. Begley has attended and/or presented papers at national and international conferences related to geotechnical areas. He is also experienced in computer modeling of underground excavations. Conferences attended include:

1) MINexpo - International Coal Show (1992)
2) Coal Focus (1991, 1992, 1993, 1994)
3) U.S. Symposium on Rock Mechanics (1984, 1989)
4) International Conference on Ground Control in Mining (1982 - 1995)
5)Annual meeting of the Society of Mining Engineers (1989, 1991)
6) Workshop on Surface Subsidence due to Mining (1981, 1986, 1992)
7) Use of Computers in the Coal Industry (1986, 1995)

Dr. Begley has worked on eight projects for Ackenheil which included: landslide remediation, rock slope stabilities, abandoned mine opening reclamation, and landslide computer simulation.

(2) **Coal Wastes - Backfilling and Grading**: Dr. Begley taught undergraduate courses dealing with coal preparation and disposal and has worked on 3 different projects for Ackenheil related to reclamation of coal refuse piles.

(3) **Surface Water Hydrology**: Dr. Begley has taught an undergraduate course which involved the prediction of surface run off and design of channels and storage ponds.

(4) **Subsidence**: Dr. Begley worked with subsidence for eleven years with the Department of Mining Engineering at West Virginia University. His graduate work involved both physical and analytical modeling of subsidence for both room and pillar and longwall mining which offers much more flexibility than other techniques. He worked on a three year case study in northern West Virginia which involved 3 separate mine sites and both surface and subsurface instrumentation. He has worked on 2 different projects for Ackenheil related to mine subsidence prediction and has over 10 papers published in peer reviewed proceedings related to mine subsidence and mine subsidence prediction.

(5) **Ground Water Hydrology**: Dr. Begley's experience with this topic is related to the effect of mining on ground water through the case study mentioned above, and another 3 year case study related to prediction of ground water flow with computer models.

(6) **Geology and Coal Resources**: Dr. Begley has been exposed to the Appalachian Geology and Coal Reserves through several different undergraduate and graduate level courses. These courses included extensive field work in Kentucky, West Virginia, and Virginia. He also has performed several coal reserve analyses for both academic and professional considerations.

SCOTT A. PRATT

Education:

B.S. Geology, Marshall University, 1999.

Certification:

WVDOH Certified Compaction Inspector
WVDOH Certified Aggregate Sampler

Background:

Mr. Pratt joined Ackenheil Engineers and Geologists, Inc. in July 1999. Since joining the firm he has worked on a variety of projects, including twenty (20) AML projects. His primary responsibility is serving as Project Field Geologist. Mr. Pratt has also been involved in test boring inspection, hydrogeology, construction monitoring, and geotechnical field and laboratory testing.

Experience as Related to AML Work:

(1) **Test Boring Inspector**: Mr. Pratt has served as a test boring inspector for two major highway construction projects. His duties included drilling supervision, soil and rock core identification, field reconnaissance and coordination with property owners. He was also responsible for the preparation of geologic logs. He has served as a test boring inspector on seven (7) West Virginia Department of Environmental Protection AML projects. The drilling program involved installation of piezometers to determine how much water was in the abandoned mine.

(2) **Hydrogeology:** Mr. Pratt has worked on six (6) waterline extension feasibility studies for the West Virginia Department of Environmental Protection Office of Abandoned Mine Lands and Reclamation. The projects investigated whether or not past coal mining (pre-1977) has affected the quality or quantity of drinking water. His involvement in these projects included geologic reconnaissance, interviewing the residents of the study area, water sampling, and field water testing. Other responsibilities included the development of project site maps, general geology maps, mining information maps, and geologic cross sections of the study area.

(3) **Construction Inspection**: Mr. Pratt has served as a construction inspector for two projects. One of the projects involved the remediation of a landslide and construction of drainage improvements. His duties included construction monitoring and coordination with property owners. Documentation of the construction work was performed by him using photographic and video cameras. Daily field reports were prepared by him of the construction work performed. A final report was prepared by him pertaining to the remediation construction which included preconstruction and as-built cross-section

drawings, chronological photographs, comparison of preconstruction bid and as-built construction pay quantities, and narrative. Another project which he served as a construction inspector was on a landfill project. The project involved construction of a sediment pond, a sediment pond embankment, the principal and emergency spillway for the sediment pond embankment, installation of a sewer line, and underdrains. He also monitored the in-place density testing performed by an independent testing firm. Daily field reports were also prepared by him.

(4) **Construction and Laboratory Testing:** Mr. Pratt has experience performing soil in-place density testing on a landfill closure project, in which in-place density tests were required on all underdrain and pipe backfills, the soil cover over the landfill, and the sedimentation pond embankment. He has also performed in-place density testing on asphalt pavement. He has experience performing various geotechnical laboratory tests such as, sieve analyses, hydrometer tests, Atterberg limits tests, Proctor tests, and rock core and concrete compression tests. His field experience includes concrete coring, and hand auger/cone penetrometer testing.

(5) **Geotechnical Drilling:** Mr. Pratt also has experience as a driller and drill helper. He has considerable drilling experience on geotechnical and AML related projects. He has overseen many aspects of a drilling program such as, determining location of test borings, soil sampling, rock coring, and preparation of drilling logs and geologic logs.

Island Creek #1
Mine Complex

- Potential Subcontractors

features. Our experience includes CADD and GIS projects like nationwide wetlands mapping, forest mapping, cultural features in foreign countries, and storm drain inventories.

Database Design. The hub of a modern enterprise GIS lies in the database, and its design and development is critical to a successful GIS implementation. Photo Science is experienced with ArcGIS and the new geodatabase data model. Modular, scalable, and extensible in nature, this new object-relational data model and enabling ESRI-based technology (ArcSDE and ArcIMS) allows the construction and deployment of true enterprise GIS solutions. We also have extensive experience implementing enterprise GIS solutions utilizing a variety of relational databases such as Oracle, Sybase, and MS Access.

Application Software Development. In addition, Photo Science has extensive computer programming and application development expertise, including developing decision-making tools for transportation, water resources, emergency management, environmental science, and planning disciplines; and developing graphical user interfaces (GUIs) to enhance data conversion, softcopy functions, and integration of different systems. Our GIS software expertise includes, but is not limited to, ArcGIS, ArcInfo, ArcView, Intergraph MGE, MicroStation, and AutoCAD Map. Photo Science's programmers routinely provide AML, Avenue, Visual Basic, and C code for ESRI products; and MDL, UCM, C, C++, and Micro CSL code for Intergraph products. These programmers also have experience providing database programming for Oracle, Microsoft SQL, dBase, Informix, Access, or INFO. GUIs, side-bar menus, and buttons have been developed for our MicroStation and MGE clients; and GUIs and decision support and web-based applications have been developed using ArcGIS.

Training. Photo Science is a nationally recognized provider of customized, on-site GIS training, specializing in ESRI, AutoCAD, and Intergraph software. Since 1990, more than 400 students have been trained by our staff. We have also developed many custom data-specific course instructions. In fact, one of Photo Science's GIS Experts authored **Inside ArcView GIS 8.3**. This 500-page published user manual is considered in the industry to be one of the most comprehensive ArcView guides available today.

3-D Visualization. Photo Science offers 3-D visualization products and services to a variety of federal and non-federal clients. Our team uses a variety 3-D modeling and simulation tools, including use of the latest in high-end graphics rendering technologies. Additionally, we employ a number of methods to build visual representations, utilizing both CADD- and geospatial information-based software solutions. Some successful example applications of these techniques include military planning and simulation; law enforcement and emergency management; planning and design for transportation engineering; and community outreach.

Remote Sensing

Since the early 1990's, Photo Science has been a recognized leader in the remote sensing industry and provides an unmatched ability to acquire and analyze remotely sensed imagery. We possess the specialized software tools and successful past project experience with all types of remotely sensed data including multispectral, hyperspectral, and radar.

Photointerpretation. Our team is highly experienced in photointerpretation and feature extraction, having more than 30 years of experience providing these services to a variety of federal, state, and local government customers. Although our roots stem from the conventional photointerpretation world, Photo Science has provided extensive softcopy interpretation and feature extraction services for a wide range of applications since 1997. Our team

utilizes the latest in 3-D softcopy feature extraction technology to provide greater speed, accuracy, and integration of collected feature information.

Image Processing / Change Detection. Photo Science offers full-service image processing and analysis services utilizing a host of commercial satellite imagery sensors such as Landsat, SPOT, AVHRR, RADARSAT, and IRS, as well as remotely sensed data collected from aircraft equipped with multispectral and hyperspectral sensors. Additionally, Photo Science also has more than 25 years of specialized experience working with sensitive U.S. government sources of data, and routinely provides imagery processing and analysis services for a host of Department of Defense and U.S. Intelligence community customers. Photo Science utilizes a host of commercially available image processing software solutions such as Leica Geosystems ERDAS Imagine software to provide geocoding, image mosaicking, radiometric enhancing, histogram matching, color balancing, and 3-D visualization services.

Thematic Mapping. Photo Science offers an unmatched ability to acquire and analyze remotely sensed imagery; our subject matter experts offer the skills, background, and in-depth specialized experience to analyze virtually any type of remotely sensed information including multispectral, hyperspectral, and radar data. Utilizing a combination of visual recognition and/or spectral analysis techniques, our analysts identify homogenous areas within an image, and then group and classify these areas into regions that are used to represent specific themes on a map. Making this possible, Photo Science employs a variety of traditional image interpretation and automated softcopy image processing methods and techniques to generate thematic mapping products for applications such as land use/land cover, wetlands mapping, and terrain analysis.

Surveys

Photo Science has a wealth of knowledge and experience in performing aerial photogrammetric control surveying. Beginning more than 30 years ago with conventional surveying methods, our services have expanded through the years to include ground-based GPS control surveying, airborne GPS, and inertial techniques. Our team is an industry leader in the procurement of airborne GPS technology. To date, Photo Science has successfully completed thousands of airborne GPS missions nationwide, utilizing the Leica Geosystems software for precise photo event determinations. All of Photo Science's aircraft are equipped with navigational GPS receivers, as well as airborne GPS technologies. Additionally, Photo Science has robust ground survey capabilities, and provides substantial support of aerial data acquisition and photogrammetric survey operations. We currently provide the full spectrum of professional surveying services, utilizing the latest in survey equipment, software, and techniques including the use of advanced dual frequency GPS receivers.

PHOTO SCIENCE
Geospatial Solutions

Photo Science Headquarters
2670 Wilhite Drive ✦ Lexington, Kentucky 40503
Phone: 859-277-8700 ✦ Fax: 859-277-8901
www.photoscience.com

LiDAR Data Acquisition. Photo Science is an industry leader in the collection and processing of airborne Light Detection and Ranging (LiDAR) information. LiDAR is an active remote sensing system that uses airborne laser scanning technology to emit pulses of light to illuminate the terrain. Photo Science utilizes the latest in LiDAR technology, employing the Leica Geosystems ALS50-II sensor. In addition to acquisition, Photo Science utilizes a variety of technologies to process the acquired, raw LiDAR information—converting ASCII point samplings to finished digital elevation models, surface terrain models, and digital contour products.

Photogrammetric Mapping

Since 1974, Photo Science has provided a wide range of photogrammetric mapping services including aerotriangulation, stereocompilation for planimetric and topographic mapping, orthophoto generation, and complete photographic laboratory services in support of photogrammetry programs.

Aerotriangulation. Our team has performed in-house aerotriangulation to support photogrammetric compilation and orthophoto production for many years. Intergraph ISAT aerotriangulation software is the software package most often utilized by our staff to determine the position and rotation angles of each of the acquired aerial photos and to establish their relationship to the ground.

Stereo Compilation. Our stereo compilation experts are highly experienced providing both large scale (1"=20') and small scale (1"=2,000') planimetric and terrain feature extraction in support of topographic mapping. The scope of our project experience ranges from small, engineering level survey and mapping projects to comprehensive and extensive statewide mapping initiatives.

Digital Orthophotography. Over the years, Photo Science has compiled and delivered tens of thousands of black-and-white, color, and CIR orthophotos. A considerable amount of our experience stems from our two consecutive USGS contracts where we developed the digital orthophoto production process used by USGS for the National Mapping Program, as well as the USGS-accepted, second-generation production process (using new aerial photography and previous aerotriangulation and control to update existing orthophotos).

Photographic Laboratory / Scanning. In addition to our traditional photographic laboratory services, Photo Science provides high resolution, photogrammetric quality scanning capable for digitizing color, CIR, and black-and-white photos. Photo Science owns and operates the most state-of-the-art scanners in the photogrammetric marketplace today. They are capable of bearing multiple resolutions from 7.5 to 20 microns.

Geographic Information Systems

Since 1985, Photo Science has offered the full spectrum of GIS services from data conversion to application development and implementation. During this timeframe, we have developed proven work flow, management, and QA/QC plans that allow us to effectively provide these "end-to-end" GIS services for our clients with large and complex data needs.

Data Capture / Conversion. Our large CADD and GIS projects have all required the conversion of digital data, the digitizing of paper maps and manuscripts, working in different projections and datums, and setting up an automated QC program. This experience has established Photo Science as an industry leader in data conversion of complex data needs. We perform these services for a variety of natural resources, cadastral, infrastructure, and cultural

PHOTO SCIENCE
Geospatial Solutions

COMPANY QUALIFICATIONS

Founded in 1974, Photo Science is a full-service Geospatial Solutions firm, specializing in aerial imaging and data collection, photogrammetric mapping, GIS, remote sensing, and surveying services. Headquartered in Lexington, Kentucky, we employ more than 180 professional and technical staff in seven production facilities who are devoted exclusively to providing geospatial services to federal, state, and local agencies, as well as private sector customers. We have a strong group of professionals, including registered Certified Photogrammetrists (15), Professional Land Surveyors (16), Professional Surveyor and Mappers (3), and Professional Engineers (2), with many years of experience in all facets of geospatial solutions.

Additionally, Photo Science has invested millions of dollars in state-of-the-art equipment to stay current with the ever changing geospatial industry. Photo Science owns and operates three Z/I Imaging Digital Mapping Cameras (DMCs), an Applanix Digital Sensor System (DSS) 322 medium-format digital mapping camera, and two Leica Airborne Laser Scanners (ALS) 50-II LiDAR sensors, nine airworthy aircraft, four precision analog cameras, as well as softcopy photogrammetric and GIS workstations and software, and surveying equipment.

PHOTO SCIENCE CORE SERVICES

Aerial Imaging and Data Collection
- Aerial Photography
- Digital Aerial Imaging
- LiDAR Terrain Mapping

Photogrammetric Mapping
- Aerotriangulation
- Stereocompilation / Feature Extraction
- Digital Orthophotography
- Photographic Laboratory / Scanning

Geographic Information Systems
- Data Capture / Conversion
- Database Design
- Application Software Development
- Training
- 3-D Visualization

Remote Sensing
- Thematic Mapping
- Image Processing / Analysis
- Photointerpretation
- Change Detection

Surveys
- Airborne GPS / IMU
- GPS Surveys / Geodetic Control
- Conventional Surveys

Aerial Imaging and Data Collection

Precision aerial photography is a critical component of accurate surveys and mapping. Photo Science offers a fleet of aircraft equipped with precision cameras and state-of-the-art navigation equipment that enables the capturing of a wide range of aerial photography and digital imagery products. Our experienced crews have completed thousands of photo missions using both analog and digital cameras, providing imagery products in support of utilities, transportation, floodplain mapping, engineering design, and environmental mapping.

Airworthy Aircraft. Photo Science owns and operates nine FAA-certified aircraft to provide aerial photo missions. Each aircraft is capable of supporting virtually any type of traditional and digital aerial photogrammetric mission and are equipped with airborne Global Positioning Systems (GPS) receivers, Inertial Measurement Units (IMU), forward-motion compensation (FMC), and gyro-stabilized camera mounts.

Traditional and Digital Aerial Photography Acquisition. In support of traditional aerial photo missions, Photo Science offers four USGS tested and calibrated analog photogrammetric cameras. Additionally, Photo Science's two state-of-the-art Z/I DMCs provides for the direct capture of high resolution, large format, multispectral (R,G,B, NIR) aerial imagery. The DMC is the industry's most innovative and precise turnkey digital camera system supporting aerial photogrammetric missions for the broadest range of GIS and remote sensing applications. Photo Science is only one of five firms in the country to own this high-end large-format digital imaging capability.

Photo Science utilizes the latest in aerial imaging – the Applanix DSS 322. The DSS 322 system is technology engineered to maximize the system's capability in generating high-quality color and color infrared (CIR) digital geospatial imaging products. The DSS is a ready-to-use, directly georeferenced, medium-format, airborne digital camera system.

PHOTO SCIENCE
Geospatial Solutions

AIRCRAFT AND CAMERAS

PHOTO SCIENCE Aircraft

	1. 840 Turbine Commander	2. 690B Turbine Commander	3. PA-31 Navajo	4. Cessna T-310R	5. Cessna T-210N	6. Cessna U-206G	7. Cessna U-206G	8. Cessna U-206H	9. Cessna U-206H
Tail Number	N910FC	N167R	N101UF	N2737U	N6479Y	N7320G	N9471R	N2448G	N7266Z
Manufacturer	Gulfstream	Rockwell International	Piper	Cessna	Cessna	Cessna	Cessna	Cessna	Cessna
Year	1981	1978	1977	1980	1981	1977	1985	2000	1999
Serial Number	11682	11437	31-7712102	310R1826	21064399	U20603763	U20606870	20608096	20608060
Engine Configuration	Twin	Twin	Twin	Twin	Single	Single	Single	Single	Single
Turbo Charged	Turbine	Turbine	Yes	Yes	Yes	No	No	No	No
Cruise Speed (knots)	300	270	180	185	160	130	130	140	140
Airborne GPS Equipped	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Flight-Management System	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Service Ceiling (feet)	34,500	31,000	26,300	27,400	28,500	16,700	16,700	15,700	15,700

PHOTO SCIENCE Cameras

	Aerial Cameras				Digital Cameras		
	1. Zeiss RMK-TOP 15	2. Zeiss RMK-TOP 15	3. Zeiss LMK-2000	4. Zeiss LMK-1000D	6. Z/I Imaging DMC	7. Z/I Imaging DMC	8. Applanix DSS 322
Serial Number	144117	145843	272302C	269155D	13	33	78
IMU Unit	No	Yes	Yes	Yes	Yes	Yes	Yes
Forward-Motion Compensation	Yes	Yes	Yes	Yes	Yes	Yes	N/A
Gyro-Stabilized Mount	Yes	Yes	Yes	Yes	Yes	Yes	Azimuth Mount
Dual Magazine	Yes	Yes	Yes	Yes	N/A	N/A	N/A
Calibration Date	08/28/07	09/30/06	06/21/06	01/03/07	12/04	03/06	01/06
AWAR	107	100	97	97	N/A	N/A	N/A
Format	Large	Large	Large	Large	Large	Large	Medium

Jack L. Mitchell, PLS, CP

Project Manager

Mr. Mitchell serves as a Project Manager for the firm. He offers more than 30 years of experience relating to photogrammetry, mapping, and surveying. He has a strong technical background in engineering related drafting and design services as well as cost estimating for photogrammetric projects. His work experience includes the supervision of surveying, drafting, and digital map compilation. He supervises the daily operation of first-order analytical stereo plotters including Kern DSR-11s, Kern DSR-14s, International Imaging Systems Alpha 2000s, QASCOs, and Intergraph IMAs, KDMS, Softplotters, and ImageStation SSKs by Zeiss.

As a Project Manager, Mr. Mitchell serves as 'point-of-contact' to many of the firm's clients. For many projects, he guides and coordinates all work disciplines to meet the individual specifications of each project. He is responsible for coordinating all disciplines for schedules, meetings, deadlines, etc.; maintaining correspondence, contracts, etc.; managing any changes in scope and requesting additional fees; coordinating quality control. Mr. Mitchell assists in preparation of coordination standards within the firm and participates in the selection, training, and development of new personnel.

Office Location
Lexington, Kentucky

Education
Drafting and Surveying Coursework
U.S. Navy Surveying School

Licensure / Certification
Professional Land Surveyor NC
Photogrammetric Surveyor SC
Certified Photogrammetrist

Affiliations
ASPRS

Training
PSMJ Project Managers Boot Camp

Years of Experience: >30

Years with PSI: 18

FEDERAL

Aerial Photography, Survey Control, and Digital Topographic Mapping; Hoods Creek, KY. USACE Huntington District. *Project Manager.* This project consisted of obtaining black and white aerial photography at a scale of 1:8000, photo control survey, analytical triangulation, and digital mapping was provided at 1"=100' scale with a 2-foot contour interval.

City and County Mapping, Roanoke County, VA. USACE Wilmington District. *Compilation Manager.* Project consisted of phases to be completed during a five-year period. Phase I consisted of digital mapping and digital orthophotography for 85 sheets at 1"=100' scale in the city and 162 sheets in the county, as well as 247 map sheets for the digital orthophotos. Basic stereo compilation consists of DTM, planimetric, and topographic mapping at a scale of 1"=100' with 2-foot contours in city areas and 1"=200' with 4-foot contours in county areas. End products consists of AutoCAD files for topographic mapping and ASCII files for mass points and breaklines for use in Microstation software and digital orthophotos at 1"=100' scale. All utilities were located using GPS procedures in order to achieve accurate positioning on the maps. All electronic information is delivered on ISO 9660 formatted CDs.

Photogrammetry & Related Services Contract, Flood Study, Knox County, KY. USACE Huntington District. *Compilation Supervisor.* Digital mapping of planimetric features and breaklines at 1"=100' countywide digital orthophotography in TIF format with 1' pixel resolution at ground scale. Mapping products were delivered in MicroStation DGN format.

Photogrammetry & Related Services Contract, IENC Mapping, Cumberland River, KY. USACE Huntington District. *Compilation Manager.* Digital planimetric mapping at 1"=100' scale. Project began at Cumberland River mile 0 and continued to Cumberland River mile 381 near Celina, TN. Mapping used to support the IENC navigation river chart GIS program currently under contract with Photo Science. Mapping products were delivered in MicroStation DGN format.

Photogrammetry & Related Services Contract Shoal Creek, Lawrenceburg, TN. USACE Huntington District. *Compilation Manager.* Planimetric / topographic maps for the 5.6 and 25.9 square mile areas, showing 2' contour

intervals and all features – such as roads (paved and unpaved), parking areas, utility poles, streams, bridges, draining, building (10' x 10' and larger), tree lines and groups of timber, and fences. Mapping products were delivered in MicroStation DGN format.

Inland Electronic Navigation Chart (IENC) Development, Ohio River. US Army Topographic Engineering Center. *Compilation Manager.* New black and white aerial photography at 1"=1000' was acquired covering the Ohio River from Cairo, Illinois to the Smithland Lock and Dam. This project required airborne GPS and IMU data collection with digital mapping at 1"-100' scale and contours at 2' interval. Mapping products were delivered in MicroStation DGN format.

Survey and Mapping Contract (Civil & Military, Mill Creek and East Fork Mill Creek. USACE Louisville District. *Compilation Manager.* Digital topographic mapping performed at 1"=50' scale at selected sites along the stream corridor. Mapping products were delivered in MicroStation DGN format.

STATE

PaMAP Orthophoto Program, Statewide, PA. Pennsylvania Bureau of Topologic and Geologic Survey, DCNR. *Technical Manager.* Recently managed the entire aerial acquisition phase of the 2005 PaMAP orthophoto program. This included logistical management of seven aircraft with cameras and crews that were deployed to secured aerial imagery for 28 Pennsylvania counties, including Erie County, in one flying season. Also providing technical direction and management to Photo Science's photogrammetric technicians who are responsible for stereo digitizing Digital Elevation Model (DEM) data from this PaMAP imagery later this year.

Open-End Photogrammetry Contract (since 1981), Statewide. Kentucky Transportation Cabinet. *Compilation Manager.* Responsible for digital stereo compilation, interactive graphics (Intergraph), digital cross sections, final ink-on-mylar plots and digital files, and digital elevation modes (DEM). Basic photogrammetric services were used to aid in engineering design of heavy highway and bridge projects to support the Cabinet's mission.

Open-End Mapping Services & Related Work Contract and Open-End Aerial Photography for Photogrammetric Mapping Contract (since 1992), Statewide. West Virginia Department of Transportation. *Compilation Manager.* Responsible for digital stereo compilation, interactive graphics (Intergraph), digital cross sections, final ink-on-mylar plots and digital files, and digital elevation modes (DEM). Basic photogrammetric services were used to aid in engineering design of heavy highway and bridge projects to support the Department's mission.

MUNICIPAL

Mapping Of Orange County Drainage Basins, Orange County, FL. Board of County Commissioners. *Compilation Manager.* Photo Science was contracted to create and deliver to Orange County digital terrain models and digital 1-foot contours (with ArcINFO GIS coverages), orthophoto contour maps at a scale of 1"=200', 1"=1000' photo mosaics with accompanying aerial photography and ground control, along with other miscellaneous data for use in preparing a specific basin – planning program consistent with the Master Stormwater Management Plan. Services include: aerial photography acquisition and photogrammetric mapping, GIS (Geographical Information System) and software support services, digital terrain modeling, aerial triangulation, digital orthophotos, topographic surveys, geodetic surveys, quantity surveys, planimetric base mapping, LIDAR, airborne real time GPS, low-altitude mapping photogrammetry, and first- or second- order leveling.

Aerial Photography and Digital Topographic Mapping, Elkins Water Improvement. Chapman Technical Group. *Project Manager.* Photo Science provided new black-and-white aerial photography, film processing, and two sets of contact prints at a negative scale of 1"=500'. In addition, one set of control contact prints, one set of .007" mapping diapositives, and coordination of the flight team with the field survey personnel were also provided. Photo Science provided analytical control extension for all photography covering the project map area. Topographic mapping at 1"=50' scale with a 2-foot contour interval was provided All data was delivered in AutoCAD format. Map detail was illustrated in accordance with standard mapping symbols and in accordance with

the National Map Accuracy Standards.

Aerial Photography and Digital Topographic Mapping, Harman, WV. Chapman Technical Group. *Project Manager.* This project encompassed +/- 500 acres. Photo Science provided new black-and-white aerial photography, film processing, and two sets of contact prints at a negative scale of 1"=400'. Photo Science provided one set of control contact prints, one set of .007" mapping diapositives, and coordination of the flight team with the field survey personnel. Also provided was the analytical control extension for all photography covering the project map area. Photo Science prepared topographic mapping at 1"=50' scale with a 2-foot contour interval. All data was delivered in AutoCAD format. Map detail was illustrated in accordance with standard mapping symbols and in accordance with the National Map Accuracy Standards.

Surveying and Mapping Contract, Hillsborough County, FL. Hillsborough County Purchasing Department. *Compilation Manager.* Digital terrain models were captured from the 1"=400' scale photography using both analytical and softcopy stereoplotters. The quality of the data was carefully checked and initial contours created for internal QC, before the final DTM deliverable was made to Hillsborough County in ESRI ArcGEN files. Planimetric base mapping was captured along with the DTM data. Features included buildings, pavement, water features, railways, and vegetation.

Bartow Countywide Base Map 2005, Bartow County, GA. Bartow County Government. *Compilation Manager.* Responsible for planimetric and topographic mapping. Features were captured by direct stereo digitizing and delivered in ArcGIS 9.0 personal geodatabase format. Two-foot contour mapping was generated from the project's DTM surface. The DTM data was captured exclusively by photogrammetric techniques. Photo Science used softcopy and analytical stereo-plotter workstations to produce the DTM(s) that were used to generate the orthophotos. Because the DTM was sufficient to support digital orthophotos and the generation of 2-foot contours, it contained break lines at all significant terrain breaks, including all of the curb lines and other relevant planimetric features existing at ground level. Enough break line and mass points were collected beyond the project buffer area boundary to ensure project accuracy requirements.

GIS Program, Versailles, KY. Versailles-Midway-Woodford County Planning Commission. *Compilation Manager.* Responsible for digital planimetric and topographic base mapping covering 192 square miles at the following map scales: 1"=100' scale with a 2-foot contour interval covering the cities of Versailles and Midway, Kentucky; and 1"=200' scale with planimetric and DEM mapping of the remainder of Woodford County, Kentucky.

GIS Program, City of Paducah & McCracken County, KY. *Compilation Manager.* Responsible for digital planimetric and topographic base mapping covering 300 square miles. Delivery of all digital mapping files in MicroStation and AutoCAD format and digital imagery in georeferenced TIFF format.

GIS Program, Elizabethtown, KY. *Compilation Manager.* Responsible for mapping performed at 100' scale with 2-foot contour intervals. End products were delivered on 3.5" diskettes in AutoCAD format.

GIS Program, City of Georgetown, KY and Surrounding Area. Georgetown-Scott County Planning Commission. *Compilation Manager.* Responsible for digital planimetric and topographic base mapping covering 260 square miles. Delivery of all digital mapping files in ArcINFO format and digital imagery in georeferenced TIFF and MrSID format.

GIS Program, City of Jasper, IN and Surrounding Area. *Compilation Manager.* Responsible for digital planimetric mapping for a total of 90 square miles located in and around the City.

GIS Program, City of Owensboro, KY and Surrounding Area. Owensboro Information Services. *Compilation Manager.* Responsible for digital base mapping services for development of a GIS Program for areas totaling 10,059 miles. Deliverables in both AutoCAD and ArcINFO.

Forrest E. Godby, PLS

Flight Department Manager

Mr. Godby, PLS is a Project Manager and the Flight Department Manager for Photo Science – he offers more than 30 years of experience. His duties include responsibility for numerous aerial photography, photogrammetric, and digital facility management projects including planning, development, budgets, personnel, equipment allocation, and client contact for federal, local, state, and private clients.

As the firm's Flight Department Manager, he is responsible for evaluating flight priorities and directing the firm's flight crews to ensure completion of all aerial photography; cost estimation on all major projects undertaken by the firm that includes number of flight lines and exposures which has a direct impact on project costs for everything that takes place after the acquisition of photography - extending into photo lab products, scanning, mapping, orthophotography, field control, and other related areas within a project.

Office Location
Lexington, KY

Education
BS Recreation & Parks Administration

Licensure / Certification
Professional Land Surveyor NC
Professional Land Surveyor SC
Professional Certified Pilot

Years of Experience: >30

Years with PSI: 9

FEDERAL

NAIP (National Agricultural Imagery Program), Nationwide. U.S. Department of Agriculture. *Project Manager.* In 2003 Photo Science was awarded an initial one-year contract for providing NAIP Aerial Photography for portions of the states of New York, Pennsylvania, South Carolina, and Arizona. In 2004, an additional base-year contract, with two option years was awarded to Photo Science. 2004 NAIP Aerial Photography included the states of Mississippi, New York, South Carolina, Tennessee, and Virginia. 2005 NAIP Aerial Photography included the state of Indiana. Photo Science was also contracted to provide this same service in 2006 for Indiana, Kentucky, and Ohio. NAIP is comprised of scanned photographs acquired on color positive film leaf-on with mature crops prior to harvest. The imagery is quarter-quadrangle centered to provide consistent and repeatable coverage and delivered as Orthorectified imagery in MrSID format county files. The interim product has been created to provide timely information for the Farm Services Agency's compliance programs. This includes using the NAIP imagery as a base for Farm Service Center GIS applications and is used to administer USDA commodity support programs and conservation planning. The MrSID mosaics are compiled to provide a data format that is highly compressed (20:1) with minimal data loss. Photo Science utilized large format USGS calibrated aerial cameras with Inertial Measurement Units (IMU) on board the aircraft and GPS Continuously Operating Reference Stations (CORS) to control the imagery.

NRI / PSU (National Resources Inventory / Primary Sample Units), Nationwide. U.S. Department of Agriculture. *Project Manager.* Photo Science has worked with the USDA since 2002, performing on North Carolina, South Carolina, Kentucky, and Georgia PSU photography through 2005. Photo Science was also contracted to provide this same service in 2006 for Kentucky and Georgia and will be beginning photography in early April 2006. Results of past contracts should be available from the USDA Contract Manager. Photo Science is proposing to acquire the photography needed in our area of interest utilizing ABGPS / IMU technology as well as AT that will provide the control necessary to produce the Digital Ortho Quarter Quads. This combination will be the most efficient method to produce the imagery, with the accuracies desired in the timeframe required.

Digital Aerial Imagery Acquisition, Coastal Southern Louisiana. U.S. Geological Survey. *Flight Department Manager.* Photo Science was tasked to collect digital aerial imagery, using a large format digital sensor, for all of coastal Louisiana, an area comprised of approximately 20,253 square miles or 1,265 DOQQs. Collection occurred within a 30-day window from mid-October through mid-November to produce panchromatic, color, and color infrared digital imagery at a source resolution of 2.5-feet to support wetland change detection along the coast for the USGS National Wetlands Research Center. Imagery was collected at 25,000 AMT providing for a

60% forward overlap and 30% sidelap to generate 2,890 photographic frames from 71 flight lines and 4,402 flight line miles. Imagery was controlled with ABGPS and IMU and available National Geodetic Survey (NGS), continuously operating GPS reference stations (CORS) were incorporated into the horizontal and vertical control management of the over flight coverage. High resolution, pan sharpened, color infrared, one-meter GSD orthophotos were generated along DOQQ boundaries and delivered in a GeoTIFF format. Stereo imagery was also generated (compliant with Socet Set softcopy software) along with an aerotriangulation block for future feature extraction. Metadata, control reports, and flight line data were also provided to the client with the imagery and orthophotos on firewire hard drives. This task was very complicated due to Hurricane Katrina and Hurricane Rita hitting the Louisiana coastline just weeks before this task was scheduled to occur, making travel, aircraft and crew pre-positioning, and the availability reliable control a logistical challenge.

Photogrammetric Mapping and Aerial Photography Contract, Nationwide. U.S. Army Corps of Engineers, St. Louis District. *Flight Department Manager.* Responsible for providing coordination of all aerial photography acquisition for task orders issued by the District. Thirteen (13) task orders were issued under this contract.

Photogrammetry and Related Services Contract, throughout the Huntington District. U.S. Army Corps of Engineers, Huntington District. *Flight Department Manager.* Responsible for providing coordination of all aerial photography acquisition for task orders issued by the District. Sixteen (16) task orders were issued under this contract.

Survey and Mapping Contract, throughout the Louisville District. U.S. Army Corps of Engineers, Louisville District. *Flight Department Manager.* Responsible for providing coordination of all aerial photography acquisition for task orders issued by the District. Twenty-five (25) task orders were issued under this contract.

Developing and Populating a Graphical Interactive Databases, throughout the Memphis District. U.S. Army Corps of Engineers, Memphis District. *Flight Department Manager.* Responsible for providing coordination of all aerial photography acquisition for task orders issued by the District. Ten (10) task orders were issued under this contract.

Cartographic Services Contracts II, Nationwide. U.S. Geological Survey. *Flight Department Manager.* Responsible for providing coordination of all aerial photography acquisition for task orders issued by the District. Twenty-eight (28) task orders were issued under this contract.

Tri-County Topographic Data Acquisition, USACE, St. Louis District, San Antonio, Texas. *Flight Operations Manager.* Responsible for all flight planning and coordination of aircraft and crews to stage the acquisition of LiDAR data over a more than 650 square mile area within the floodplain of the Tri-County Flood Study (Wilson, Karnes, and Golidad counties). Collected in-track and cross-track mass point spacing of less than one meter and provided LiDAR intensity data as a deliverable.

Mapping the Mississippi River, USACE, Memphis District, from Gunnison, MS to Cairo, IL. *Flight Operations Manager* responsible for all flight planning and coordination of aircraft and crews for the acquisition of black-and-white aerial photography to support high-resolution (one-foot pixel) black-and-white orthophotos and to quality control LiDAR data that was also collect over this 1,600 square mile area.

Cibolo Creek Watershed Mapping, USACE, Fort Worth District, San Antonio, TX. *Flight Operations Manager.* Mobilized flight crews and planned flight lines in support of the acquisition of new aerial photography for 400 square miles area in support of a major flood study for the San Antonio River Authority. Acquired photography to produce 1"=1,250' negative scale photographs using AGPS and IMU.

133 Urban Areas Program, USGS Georgia, Alabama, Tennessee, Kentucky and Mississippi. *Flight Operations Manager* responsible for all flight planning and coordination of aircraft and crews to stage the acquisition of color aerial photography (using ABGPS/IMU) of nine urban areas covering more than 7,600 square miles within a three week time frame. This project required mobilization of multiple flight crews and airplanes.

Surveying and Mapping Contract, USACE, Nashville District. *Flight Operations Manger.* Mobilized flight crews and planned flight lines in support of the acquisition of new aerial photography for approximately 2,000 acres at Sewart Air Force Base; 28 miles in seven difference areas around the north impact area in Fort Campbell, KY; and various sub-impoundment sites downstream of Old Hickory Reservoir.

Statewide Orthophoto Program, State of Maine. *Flight Operations Manger* for this comprehensive, multi-year aerial photo acquisition and orthophoto effort. Directed flight planning and aerial photo collection effort, acquiring high-resolution, natural color photography for an area covering more than 23,500 square miles in the State of Maine. This project required the acquisition of aerial photos using ABGPS and IMU and collected at two different flight heights, 6,000' and 12,000', producing 1:12,000 and 1:24,000-scale photography.

Emergency Digital Imagery Acquisition for Hurricane Wilma, USACE, St. Louis District. Across Southern Florida. *Flight Operations Manger.* Project included the rapid-response acquisition of digital natural color imagery using a large-format digital sensor at 12" pixel resolution for an area of 3,200 square miles along the Florida coast, from Fort Pierce to the southern-most portion of the Florida Keys.

STATE

PaMAP Digital Orthophoto Program, Statewide. Pennsylvania Bureau of Topographic & Geologic Survey. *Flight Department Manager.* Responsible for securing aerial photography of 28 counties consisting of 566 flight lines with 15,000 exposures of color aerial photography at a negative scale of 1"=1,600' for 25,000 square miles in a single flight season. Lower altitude aerial photography was also obtained throughout the 28 county project areas for PaMAP stakeholders requiring higher resolution imagery datasets. This included working with Tioga and Lebanon Counties. In 2006, the ortho imagery component for PaMAP includes aerial photography and LiDAR for 21 western Pennsylvania counties including Butler County.

West Virginia Mapping Program, Statewide. *Flight Department Manager.* Responsible for photo acquisition of over 25,000 square miles of true color aerial photography acquisition for the entire state. All photography was captured at a photographic scale of 1"=2,400' at an altitude of 14,400' above ground. Airborne GPS (ABGPS) data to control the project was collected for all flight lines. Planning a project of this magnitude, particularly in a state with such drastic terrain relief as West Virginia, was a considerable task. Weeks were spent preparing a detailed flight plan for the state. Ninety-three (93) north-south flight lines covered the project limits, however most lines had to be broken for elevation change in multiple locations to ensure proper ground coverage and overlap. In all 459 lines were planned for this project.

MUNICIPAL

Photogrammetric Services, Los Angeles County, California. VARGIS. *Flight Department Manager.* Responsible for providing image acquisition of 76 flight lines and 5,000 exposures at an altitude of 3,000 feet Above Mean Terrain (AMT) to support the generation of 0.4-foot pixel resolution orthophotography. LiDAR collection consisted of 108 flight lines at an AMT of 6,600' sufficient to deliver 2-foot contours to National Map Accuracy Standards. All acquisition was controlled using airborne GPS and IMU technology and was supplemented by ground-based GPS base stations.

GIS Program, Cities of Versailles and Midway, and Woodford County, KY. Versailles-Midway-Woodford County Planning Commission. *Flight Department Manager.* Responsible for coordination of black and white aerial photography at 1"=800' and 1"=1500' negative scale covering 192 square miles including the cities of Versailles and Midway, Kentucky; and Woodford County, Kentucky.

GIS Program, McCracken County and Paducah, KY. City of Paducah, KY. *Flight Department Manager.* Responsible for coordination of black and white aerial photography covering 300 square miles.

GIS Program, Elizabethtown, KY. City of Elizabethtown, KY. *Flight Department Manager.* Responsible for coordination of black and white aerial photography at 1"=800' negative scale of approximately 30,000 acres.

GIS Program, Georgetown, KY and Surrounding Area. Georgetown – Scott County Planning Commission. *Flight Department Manager.* Responsible for coordination of black and white aerial photography of 260 square miles.

UTILITY

GIS Program, Dalton – Whitfield County, GA. Dalton Utilities *Flight Department Manager.* Responsible for coordination of black and white aerial photography at 1"=800' negative scale of approximately 190,000 acres. Dalton Utilities service area is composed primarily of Whitfield County, but also includes parts of five surrounding counties. Photo Science continues to provide data to Dalton Utilities on an annual basis.

GIS Program, Statewide, GA. Georgia Transmission Corporation (GTC). *Flight Department Manager.* Responsible for coordination of aerial photography is acquired at a range of photo scales from 1"=500' to 1"=1000' and has been used to produce conventional mapping and digital orthophotography.

Photogrammetry and Mapping Contract, KY. Kentucky Utilities. *Flight Department Manager.* Responsible for coordination of aerial photography that generally includes moderate- to low-altitude black and white film at various negative scales from 1"=300' up to 1"=800'.

Accident / Pipeline and Natural Gas Storage Field, Uniontown Project. Panhandle Eastern Corporation (now Duke Energy). *Flight Department Manager.* Responsible for coordination of aerial photography at a negative scale of 1"=2000'.

Gas Transmission Corridors, KY, WV, VA PA, NY. Columbia Gas Transmission Corporation. *Flight Department Manager.* Responsible for coordination of aerial photography that included high-altitude color and black and white, as well as other various negative scales for design and construction.

ENVIROPROBE
INTEGRATED SOLUTIONS, INC.
DRILLING + ENGINEERING + ENVIRONMENTAL PROFESSIONALS

Roderic E. Moore, P.E., L.R.S.
President
remoore@enviroprobeinc.com

AREAS OF SPECIALIZATION

Roderic E. Moore, P.E., CWD, LRS is president of EnviroProbe Integrated Solutions, Inc. (EnviroProbe), a drilling/direct-push, professional engineering, and environmental consulting firm.

He possesses extensive experience providing solutions to variety of complex environmental projects for various private, retail/commercial, and industrial clients, as well as state and federal government agencies.

ENVIRONMENTAL ENGINEERING AND MANAGEMENT

Mr. Moore offers a combination of project management, technical expertise and leadership experience in the environmental, engineering, regulatory compliance, and health and safety industry. His related experience and expertise is comprised of over 15 years completing engineering and environmental projects which have included:

- Asbestos Inspections
- Solid/Hazardous Waste Management
- Storm/Wastewater Management & Treatment
- Phase I/II Environmental Site Assessments
- "Brownfield" Voluntary Remediation
- Waste Minimization and Management
- Marketing and Technical Presentations
- SPCC Plans and Spill Response
- Expert Testimony
- Health and Safety Planning
- Remediation Design/Implementation
- Risk-based Corrective Action
- Staff Training and Development
- Health and Safety Plan Monitoring
- Soil - Groundwater Remediation
- Environmental Compliance Audits
- Groundwater Protection Plans
- Permitting and Regulatory Liaison

EDUCATION AND REGISTRATION

- **M.S.Civil and Environmental Engineering**, West Virginia University - December 1994
- **B.S. Civil Engineering**, West Virginia University - May 1992

- West Virginia State Board of Registration for Professional Engineers (P.E. Reg. No. 16390)
- Licensed Remediation Specialist (LRS #41), WV Department of Environmental Protection
- West Virginia Certified Well Driller (CWD #0154); WVDEP
- 40 Hour OSHA Hazardous Waste and Emergency Response (Current 8-hour Refresher)
- OSHA Confined Space Entry Training (entrant and attendant)
- ASFE Fundamentals of Professional Practice course
- Actively participate in ongoing professional development

ENVIROPROBE
INTEGRATED SOLUTIONS, INC.
DRILLING ✣ ENGINEERING ✣ ENVIRONMENTAL PROFESSIONALS

Roderic E. Moore, P.E., L.R.S.
President
remoore@enviroprobeinc.com

EMPLOYMENT HISTORY

March 2006 - Present	EnviroProbe Integrated Solutions, Inc.
March 1997 - March 2006	Potesta & Associates, Inc.
January 1996- March 1997	Terradon Corporation
September 1994 - January 1996	Omega Environmental Services, Inc.
January 1994 - August 1994	Rucker & Associates, Inc.
1992 – 1993	West Virginia University, *Graduate Research Assistant,*
Summer 1992	Stilson and Associates, Inc.
Summers 1990 – 1991	West Virginia Department of Transportation

PROFESSIONAL ORGANIZATIONS/AFFILIATIONS

- American Society of Civil Engineers
- National Ground Water Association
- Air and Waste Management Association
- Water Environment Federation
- Hazardous Materials Control Resources Institute

PROFESSIONAL EXPERIENCE

ENVIRONMENTAL SITE ASSESSMENTS, RISK ASSESSMENTS, AND REMEDIATION

Leaking Underground Storage Tank (UST) Sites:

.....Numerous commercial properties (non-retail petroleum)
..... Numerous single-site UST Owners
.....SuperAmerica
.....Limbocker Oil Company
..... Petroleum Products, Inc. – One Stop
.....Go-Mart, Inc.
..... Triumph Energy Corporation
..... WV-American Water Company
.....Marathon Petroleum Company, LLC
..... Amherst Industries, Inc.
.....Englefield Oil Company
.....Phase II ESAs for Property Transactions
..... Auto Dealerships
..... West Virginia Department of Environmental Protection

Phase I ESAs – Property Transactions:

.....Banks
..... Sellers
.....Buyers
.....Architectural and Engineering firms

ENVIROPROBE
INTEGRATED SOLUTIONS, INC.
DRILLING ⌖ ENGINEERING ⌖ ENVIRONMENTAL PROFESSIONALS

Roderic E. Moore, P.E., L.R.S.
President
remoore@enviroprobeinc.com

..... Developers
..... City Governments
..... County Governments

Phase II ESAs:

..... UST/LUST sites
..... Chemical industry
..... Commercial property
..... Residential property
..... City-owned property
..... County-owned property
..... Manufacturing facilities
..... Industrial facilities
..... Industrial waste facilities
..... Brownfield/Voluntary Remediation sites

SPILL CLEANUP AND EMERGENCY RESPONSE

..... Trucking Companies
..... Insurance Providers
..... Coal Companies
..... Chemical Industry
..... Retail Petroleum
..... Bulk Petroleum Facilities

CERCLA/RCRA/SUPERFUND

..... Fike/Artel Chemical Site – Nitro, WV
..... Burke Parsons Bowlby – Spencer, WV
..... Burke Parsons Bowlby – Goshen, VA
..... Monsanto/Solutia – Nitro, WV
..... Columbia Gas Transmission – Charleston, WV
..... Raleigh Junk Company – Sattes, WV
..... Raleigh Junk Company - Parkersburg, WV
..... Raleigh Junk Company – Charleston, WV
..... Twin City Iron & Metal – Bristol, VA

ENERGY AND RESOURCE EXTRACTION

..... Columbia Gas Transmission
..... Massey Coal Services
..... International Coal Group
..... Arch Coal
..... GASCO, Inc.

PERMITTING AND COMPLIANCE

NPDES Permitting:

..... Construction activities
..... Industrial/manufacturing activities
..... Remediation activities

Compliance Audits:

..... Numerous clients

630 Cross Lanes Drive
Nitro, West Virginia 25143
Telephone: (304) 776-6717
Fax: (304) 776-6769

Spill Prevention, Control and Countermeasure (SPCC) Plans:
..... Bulk Storage Facilities
..... Numerous clients storing petroleum products
..... Boggs Aviation – Spencer, WV
..... Amherst Industries, Inc.

BROWNFIELD AND LICENSED REMEDIATION SPECIALIST

Mr. Moore has been the Licensed Remediation Specialist, WVDEP Project Manager of record, or Project Manager for the following Brownfield/Voluntary Remediation Program (VRP) sites in West Virginia:

- VRP - Charleston Sanitary Board, Copenhaver Park Former Sludge Facility – Charleston, WV
- VRP - Proposed Wal-Mart – Glen Dale, WV
- VRP - Blenko Glass - Milton, WV
- VRP - City of Parkersburg - Former CSX Site – Parkersburg, WV
- VRP - Former G-M Properties Site (Roman Catholic Diocese of Wheeling-Charleston) - Charleston, WV
- WVDEP - Former Fostoria Glass – Moundsville, WV
- VRP - Poor Charlie & Company, Inc., Cremer Iron & Metal – Parkersburg, WV
- VRP - Amherst Industries, Former Pt. Pleasant Marine (Parcel 1) – Pt. Pleasant, WV
- VRP - Amherst Industries, Former Pt. Pleasant Marine (Parcel 2) – Pt. Pleasant, WV
- VRP - Amherst Industries, Amherst Dock Facility – Chelyan, WV
- VRP - Poor Charlie & Company, Inc., Riverside - Glasgow, WV
- WVDEP - PPG/Former Marshall Army Landfill - New Martinsville, WV
- WVDEP - Former WV Plastics (Baby World) – Grafton, WV
- VRP - Poor Charlie & Company, Inc., Campbell's Creek - Charleston, WV
- VRP - Poor Charlie & Company, Inc., Sattes – Nitro, WV
- VRP - T.L. Diamond & Company and E.I. DuPont de Nemours & Company, Spelter Smelter Facility – Spelter, WV
- VRP - Meyer Darragh Buckler Bebenek & Eck, Tanker Truck Spill Site – West Hamlin, WV
- VRP - Desco, Inc. – Weirton, WV
- VRP – Former Pack Lumber Site – Marmet, WV

These multi-disciplinary projects involved environmental site assessment, risk assessment, remediation work plan preparation/design, remediation work plan implementation, and follow-up reporting and/or monitoring.

ENVIROPROBE
INTEGRATED SOLUTIONS, INC.
DRILLING ✣ ENGINEERING ✣ ENVIRONMENTAL PROFESSIONALS

Dana A. Elkins
Sr. Geologist/GIS Specialist
daelkins@enviroprobeinc.com

AREAS OF SPECIALIZATION

Mr. Elkins is a Sr. Geologist and Geographical Information Systems (GIS) Specialist for EnviroProbe Integrated Solutions, Inc. (EnviroProbe). EnviroProbe is a woman-owned drilling/direct-push, professional engineering, and environmental consulting firm. EnviroProbe is a growing firm comprised of one Professional Engineer, environmental professionals, Geologist/GIS Specialist, drillers, and field service technicians.

Mr. Elkins has worked in the mining and engineering/environmental consulting industries as well as state government (WV Bureau for Public Health – Office of Environmental Health Service, Source Water Protection Program).

ENVIRONMENTAL ASSESSMENT, REMEDIATION AND MANAGEMENT

Mr. Elkins offers a combination of project management, technical expertise and leadership experience in the mineral extraction and environmental consulting industry. He possesses extensive experience providing solutions to variety of complex environmental projects for various private, retail/commercial, and industrial clients, as well as state and federal government agencies. His related experience and expertise is comprised of nearly 14 years completing numerous projects which have included:

- Groundwater Protection Plans
- Solid/Hazardous Waste Management
- Storm/Wastewater Management & Treatment
- Phase I/II Environmental Site Assessments
- "Brownfield" Voluntary Remediation
- GIS and related applications
- Database development and application
- SPCC Plans and Spill Response
- Surveying and mapping
- Watershed delineation and mapping
- Remediation Planning
- Site layout and roadway design
- Staff Training and Development
- Health and Safety Plan Monitoring
- Soil - Groundwater Remediation
- Environmental Compliance Audits
- Groundwater fate and transport modeling
- Permitting and Regulatory Liaison

EDUCATION AND REGISTRATION

- **B.S. Geology**, Marshall University - 1993
- 40 Hour OSHA Hazardous Waste and Emergency Response (Current 8-hour Refresher)
- 40 Hour MSHA Surface and Underground
- Actively participate in ongoing professional development

Dana A. Elkins
Sr. Geologist/GIS Specialist
daelkins@enviroprobeinc.com

EMPLOYMENT HISTORY

September 2006 - Present	EnviroProbe Integrated Solutions, Inc.
2003 - September 2006	Potesta & Associates, Inc.
2002 – 2003	Snap Creek Mining, Inc.
1999 – 2002	WV Bureau for Public Health Office of Environmental Health Services, Source Water Protection Program
1997 - 1999	Christopher Consultants, Ltd.
1994 - 1997	Guyandotte Consultants, Inc.
1991 - 1994	Ark Land Company

PROFESSIONAL ORGANIZATIONS/AFFILIATIONS

- National Ground Water Association

PROFESSIONAL EXPERIENCE

ARCVIEW AND GIS MAPPING PROJECTS

- Developed multi-well database and performed Capture Zone Analysis for the U.S. Army Corps of Engineers. Project involved fate and transport modeling using GMS Software in support of an evaluation of an existing groundwater remediation system to show it was Operating Properly & Successfully (OP&S).
- Developed mapping in support of pending litigation related to flooding.
- Developed mapping in support of pending litigation related to air deposition of contaminants from industrial facilities.
- Implemented GPS programs, trained field staff using Trimble GeoExplorer and Trimble Pocket Global Positioning System (GPS). Training included data collection methods, environmental assessments, and mapping
- Generated mapping for mine subsidence and hydrologic conditions in support of mine permitting. Also mapped geology for the permitted mine area.
- Built GIS data layers of Zones of Special Concern and Wellhead Protection Areas for public water supplies in West Virginia.
- Delineated watershed areas for surface water systems.

- Developed the West Virginia Source Water Information System (WVSWIS), Microsoft Access module which incorporated GPS data, digital photographs, and other site specific information into a single GIS using Microsoft SQL and ArcSDE to store spatial data in a geodatabase model.

- Trained field staff to perform environmental assessments, use of GPS, notebook PCs, and Microsoft Access module.

- Delineated Zones of Critical Concern (ZCC) for WV Bureau of Health based on 5-hour travel time at 90% of high flow using GIS.

- Created and maintained a database for the locations of public water supply facilities, including water intakes, wells, and springs.

- Created mine planning and reserve maps. Mapped and reported coal reserves. Generated mine-specific maps of roof and floor geology. Calculated overburden ratios for surface mines.

- Created and maintained spatial database on coal reserve holdings and managed core hole database for quantitative and qualitative coal modeling.

- Managed drilling program for large surface coal mine, including obtaining property exploration permits, scheduling road construction and working with drilling company.

- Planned large-scaled GPS project for survey control and mine construction.

- Determined reclamation cost estimates for old deep mines.

- Coordinated with field surveyors on several designs on a railroad crossing, several valley fills, mine punch-outs and road construction.

- Worked with PLS and performed boundary surveys.

- Worked with design team to design roads and travel ways to meet WVDOT specifications.

- Generated detailed topographic maps based on survey notes and SCR-33 electronic data collector using Carlson's SurvCADD 200 field to finish features.

ENVIRONMENTAL SITE ASSESSMENTS, RISK ASSESSMENTS, AND REMEDIATION

Mr. Elkins has performed or performed tasks in support of the following project types related to environmental assessment and remediation:

Dana A. Elkins
Sr. Geologist/GIS Specialist
daelkins@enviroprobeinc.com

- *Leaking Underground Storage Tank (UST) Sites*
- *Phase I ESAs – Property Transactions*
- *Phase II ESAs*
- *Spill Cleanup and Emergency Response*
- *CERCLA/Superfund*
- *Energy and Resource Extraction*
- *Permitting and Compliance*

VOLUNTARY REMEDIATION AND REDEVELOPMENT (WVDEP "BROWNFIELD")

Mr. Elkins performed various site assessment and data management on behalf of Licensed Remediation Specialists, for various Brownfield/Voluntary Remediation Program (VRP) sites in West Virginia.

These multi-disciplinary projects involved environmental site assessment, risk assessment, remediation work plan preparation/design, remediation work plan implementation, and follow-up reporting and/or monitoring.

ENVIROPROBE
INTEGRATED SOLUTIONS, INC.
DRILLING ✧ ENGINEERING ✧ ENVIRONMENTAL PROFESSIONALS

Neil A. Capper
Environmental Scientist
nacapper@enviroprobeinc.com

AREAS OF SPECIALIZATION

Mr. Capper is an Environmental Toxicologist/Scientist for EnviroProbe Integrated Solutions, Inc. (EnviroProbe). EnviroProbe is a woman-owned drilling/direct-push, professional engineering, and environmental consulting firm. EnviroProbe is a growing firm comprised of one Professional Engineer, environmental professionals, Geologist/GIS Specialist, drillers, and field service technicians. Mr. Capper has worked in the environmental consulting industry prior to, during, and following his higher education.

ENVIRONMENTAL ASSESSMENT, REMEDIATION AND MANAGEMENT

Mr. Capper offers a combination of project management, technical expertise and leadership experience in the environmental consulting industry. He possesses experience with a variety of environmental projects for various private, retail/commercial, and industrial clients, as well as state and federal government agencies. His related experience and expertise is comprised of completing numerous projects which have included:

- Phase I/II Environmental Site Assessments
- Solid/Hazardous Waste Management
- Watershed assessments
- Asbestos Inspections
- Phase I Environmental Site Assessments
- Phase II Environmental Site Assessments
- "Brownfield" Voluntary Remediation
- GIS and related applications
- LUST Site Assessments
- SPCC Plans and Spill Response
- Soil - Groundwater Remediation
- Remediation Planning
- Stream habitat assessments
- Air monitoring
- Asbestos Abatement Monitoring
- Health and Safety Plan Monitoring
- Environmental Compliance Audits
- Permitting and Regulatory Liaison
- LUST Corrective Action Plans
- Surveying and mapping

EDUCATION AND REGISTRATION

- **M.S. Environmental Toxicology**. 2006. Clemson University. Pendleton, SC
- **B.S. Marine Science (Minors in Environmental Science and Chemistry)**. 2004 Coastal Carolina University. Conway, SC
- 40 Hour OSHA Hazardous Waste and Emergency Response (Current 8-hour Refresher)
- WV Asbestos Inspector

ENVIROPROBE
INTEGRATED SOLUTIONS, INC.
DRILLING ÷ ENGINEERING ÷ ENVIRONMENTAL PROFESSIONALS

Neil A. Capper
Environmental Scientist
nacapper@enviroprobeinc.com

EMPLOYMENT HISTORY

June 2007 - Present	EnviroProbe Integrated Solutions, Inc.
September 2006 – June 2007	Triad Environmental Consulting, Inc.
August 2004 – May 2006	Graduate Research Assistant – Clemson University
August 2003 – May 2004	Laboratory Assistant – Coastal Carolina University

PROFESSIONAL ORGANIZATIONS/AFFILIATIONS

- Licensed Lead Inspector and Lead Risk Assessor
- Licensed Asbestos Inspector

PROFESSIONAL EXPERIENCE

ENVIRONMENTAL SITE ASSESSMENTS, RISK ASSESSMENTS, AND REMEDIATION

- *Leaking Underground Storage Tank (UST) Sites*
- *Phase I ESAs – Property Transactions*
- *Phase II ESAs – Primary Site Assessments, Free Product Recovery and Reporting, Corrective Action Plans*
- *Spill Cleanup and Emergency Response*
- *Permitting and Compliance*

WATERSHED WATER QUALITY MONITORING

- *Live organism cultures*
- *Stream electro-shocking and fish/organism sampling and identification*
- *Stream habitat assessments*
- *Water and sediment sampling*
- *Installation and maintenance of automatic samplers*

ASBESTOS INSPECTIONS AND ABATEMENT

- *Asbestos Sampling and Report Preparation*
- *Air Monitoring following OSHA and NIOSH Guidelines*
- *Asbestos Abatement Monitoring and Reporting*

630 Cross Lanes Drive
Nitro, West Virginia 25143

Telephone: (304) 776-6717
Fax: (304) 776-6769

ENVIROPROBE
INTEGRATED SOLUTIONS, INC.
DRILLING ✣ ENGINEERING ✣ ENVIRONMENTAL PROFESSIONALS

Eric Lupardus, CWD
Driller/Field Technician

AREAS OF SPECIALIZATION

Eric Lupardus, CWD is a Driller and Field Technician for EnviroProbe Integrated Solutions, Inc. (EnviroProbe), a woman-owned small business.

DRILLING AND PROJECT MANAGEMENT

Mr. Lupardus offers significant experience drilling in numerous geologic types using Geoprobe® direct-push technology and rotary drilling rigs. Mr. Lupardus also possesses the appropriate certifications including 40-Hour OSHA HAZWOPER, First Aid/CPR, and Certified Well Driller. Other duties and experience include soil and groundwater sampling, well development, and mentoring other drilling staff. His related experience and expertise have included:

- ·Geoprobe® 54LT, 5400, 6600, 7720DT
- · Air rotary
- · Direct-push (soil and groundwater)
- · Air sparge/SVE wells and implants
- · Monitoring wells (2", 4", and 6")
- · DPT injection of remediation compounds
- · Remediation system installation
- · Well purging and sampling
- · Mobile™ rotary drill rig
- · Health and Safety Planning
- · NQ rock core
- · Remediation/recovery wells
- · Well abandonment
- · Health and safety plan monitoring
- · Well development
- · Well design

EDUCATION AND REGISTRATION

- Roane County High School – Spencer, West Virginia
- West Virginia Certified Well Driller (CWD #00392); WVDEP
- 40 Hour OSHA Hazardous Waste and Emergency Response (Current 8-hour Refresher)
- Federal Railroad Administration (CSX Transportation) Worker

EMPLOYMENT HISTORY

October 2007 - Present	Driller - EnviroProbe Integrated Solutions, Inc.
April 2007 – October 2007	Driller - E.L. Robinson, Cross Lanes, WV
December 2003 – May 2006	Driller Helper - Triad Engineering, St. Albans, WV

ENVIROPROBE
INTEGRATED SOLUTIONS, INC.
DRILLING ✣ ENGINEERING ✣ ENVIRONMENTAL PROFESSIONALS

Roy C. Henderson
Sr. Environmental Technician

AREAS OF SPECIALIZATION

Mr. Henderson is a Sr. Engineering/Environmental Technician for EnviroProbe Integrated Solutions, Inc. (EnviroProbe). EnviroProbe is a woman-owned drilling/direct-push, professional engineering, and environmental consulting firm.

ENVIRONMENTAL SERVICES

Mr. Henderson offers significant experience in various engineering and environmental projects. Specifically, Mr. Henderson has direct experience with proper sampling of environmental media, asbestos inspections, design/build of soil and groundwater remediation systems, construction management, Phase I and II Environmental Site Assessments, NPDES Stormwater and Groundwater Protection Plans, air monitoring, leaking underground storage tank (LUST) corrective action, Quality Assurance/Quality Control (QA/QC), and drilling in numerous geologic types using Geoprobe® direct-push technology and rotary drilling rigs. His related experience and expertise includes:

- Groundwater Protection Plans
- Asbestos Inspections
- Solid/Hazardous Waste Management
- "Brownfield" Voluntary Remediation
- SPCC Plans and Spill Response
- Well purging and sampling
- Construction Monitoring
- Chemical Process Controls
- Soil/Groundwater Remediation System O&M
- Mobile Remediation Trailer O&M
- Phase I/II Environmental Site Assessments
- Health and Safety Plan Monitoring
- Soil - Groundwater Remediation
- Environmental Compliance Audits
- Drilling and Direct-push Sampling
- Monitoring Well Installation

EDUCATION AND REGISTRATION

- B.A. Environmental Technology – Glenville State College, 1997
- Environmental Technology – Calhoun-Gilmer Career Center, 1995
- High School Diploma, Gilmer County High School
- 40 Hour OSHA Hazardous Waste and Emergency Response (Current 8-hour Refresher)
- 8 Hour OSHA Supervisor Training for Hazardous Waste Activities
- Certified Asbestos Inspector – West Virginia
- WVDEP Certified Well Driller (WV00271)
- Nuclear Density Gauge Safety Certification
- Fork Truck Certification

ENVIROPROBE
INTEGRATED SOLUTIONS, INC.
DRILLING ✣ ENGINEERING ✣ ENVIRONMENTAL PROFESSIONALS

Roy C. Henderson
Sr. Environmental Technician

EMPLOYMENT HISTORY

November 2007 - Present	EnviroProbe Integrated Solutions, Inc.
1998 – 2007	Potesta & Associates, Inc., Charleston, WV
1997 - 1998	REI Consulting, Inc., Beaver, WV
1997 (Intern)	NRCS, Glenville, WV
1996 (Intern)	Terradon Corporation, Nitro, WV

630 Cross Lanes Drive
Nitro, West Virginia 25143
Telephone: (304) 776-6717
Fax: (304) 776-6769

ENVIROPROBE
INTEGRATED SOLUTIONS, INC.
DRILLING ✣ ENGINEERING ✣ ENVIRONMENTAL PROFESSIONALS

Lash N. McGhee
Field Technician

AREAS OF SPECIALIZATION

Lash McGhee is an Environmental Technician for EnviroProbe Integrated Solutions, Inc. (EnviroProbe). EnviroProbe is a woman-owned drilling/direct-push, professional engineering, and environmental consulting firm.

ENVIRONMENTAL SERVICES

Mr. McGhee began his career in the chemical manufacturing industry in 1976 before entry into the environmental services and petroleum construction industry in 1988. Mr. McGhee offers significant experience in various engineering and environmental projects. Specifically, Mr. McGhee has direct experience with proper sampling of environmental media, asbestos inspections, design/build of soil and groundwater remediation systems, construction management, Phase I and II Environmental Site Assessments, NPDES Stormwater and Groundwater Protection Plans, air monitoring, leaking underground storage tank (LUST) corrective action, Quality Assurance/Quality Control (QA/QC), and drilling in numerous geologic types using Geoprobe® direct-push technology and rotary drilling rigs. His related experience and expertise have include:

- Groundwater Protection Plans
- Solid/Hazardous Waste Management
- "Brownfield" Voluntary Remediation
- SPCC Plans and Spill Response
- Well purging and sampling
- Construction Monitoring
- Chemical Process Controls
- Soil/Groundwater Remediation System O&M
- Phase I/II Environmental Site Assessments
- Health and Safety Plan Monitoring
- Soil - Groundwater Remediation
- Environmental Compliance Audits
- Drilling and Direct-push Sampling
- Monitoring Well Installation

EDUCATION AND REGISTRATION

- High School Diploma, George Washington High School, 1973
- 40 Hour OSHA Hazardous Waste and Emergency Response (Current 8-hour Refresher)
- 8 Hour OSHA Supervisor Training for Hazardous Waste Activities
- WVDEP Underground Storage Tank Class A and B (#604) certification
- WVDEP Certified Well Driller (WV00008)
- Fork Truck Certification

ENVIROPROBE
INTEGRATED SOLUTIONS, INC.
DRILLING ✣ ENGINEERING ✣ ENVIRONMENTAL PROFESSIONALS

Lash N. McGhee
Field Technician

EMPLOYMENT HISTORY

May 2007 - Present	EnviroProbe Integrated Solutions, Inc.
2002 – 2006	Kemron Environmental Services, Inc. – Poca, WV
1997 – 2001	NESCO/NEC Inc. – South Charleston, WV
1988 – 1997	National Petroleum Testing Consultants – So. Charleston, WV
1976 – 1985	FMC Corporation – South Charleston, WV

630 Cross Lanes Drive
Nitro, West Virginia 25143
Telephone: (304) 776-6717
Fax: (304) 776-6769

THERESA SYDNEY BURKE

Assistant Project Scientist

Degrees Held:

Master of Science Degree, Biological Sciences – Marshall University 2002
Graduate Student, Life Sciences – Indiana State University, Summer 2001
Six graduate credit hours
Bachelor of Science Degree, Biological Sciences, Chemistry and Latin
Minors – Marshall University 2000
High School Diploma – Richwood High School 1996

Professional Registrations:

Wetlands – Certificate of Training, Wetland Certification Training Class (36 hr)

Additional Training:

Bat Mist Netting, Thesis – "Diets of Bats in West Virginia", also with Indiana
State University, US National Forest Service, Compliance Monitoring Labs, Inc,
BHE Environmental, and Alliance Consulting Inc. I also am permitted to
Conduct bat surveys in West Virginia.
Mammalogy – Small/Large Mammal Survey Participant, Made Museum
Specimens
Herpetology – Reptile and Amphibian Survey Participant
Ornithology – Avian Survey Participant
Ichthyology – Fish Surveying using Rotenone, Electrofishing, and Seining
Limnology – Macroinvertibrate and Habitat Surveys, Water Quality Testing
Wetlands – Certificate of Training, Wetland Certification Training Class (36 hr)
Hydrogeology – Watersheds, Wells
Plant Taxonomy
Conservation of Forest, Soil, and Wildlife – Helped collect data for an
Environmental Impact Statement (EIS)
CPR Certification
National Forest Service Driver's License

General Background:

April 2006 to Present: Staff Scientist – Alliance Consulting, Inc., Beckley, West Virginia

Ms. Burke is a staff scientist with multiple duties, including field and office work. She assists with stream and wetland delineations, groundwater inventory, and permit writing. Ms. Burke also assists in permit applications and editing documents and is currently permitted in West Virginia to conduct both bat mist

netting and portal surveys. Her job involves choosing suitable bat habitat, which includes work with a GPS unit and topographical maps, setting up mist nets, identifying captured bats, recording data, and writing reports.

August 2003 to March 2006: Wildlife Biologist- WV Dept of Environmental Protection

Ms. Burke was a permanent employee of the Water Resources Division, where she worked as a wildlife biologist. Her work involved mostly field work, with some office work as well. During the summer field season, she performed watershed assessments; and throughout the entire year she worked on a TMDL program, with a list of streams that were assigned to her. Ms. Burke performed habitat surveys, identified flora and fauna, collected water and periphyton samples, worked on reports, edited documents, compiled data, and performed quality control with the data base. She also assisted in electrofishing surveys and participated in several special surveys. She completed a defensive driving course, boat safety course, attended several Society of Eastern Biologists conferences, and participated in a condensed Rosgen training course.

Summer 2003, 2004: Wildlife Biologist – BHE Environmental, Inc.

Ms. Burke was hired as a wildlife biologist, specifically for bat capture and identification. A wide range of species was collected, including the identification and handling of several *Myotis sodalis* throughout the two years she was employed. She properly identified at least three Indiana bats over the two years of work here, and with this experience along with experience received working with Dr. Whittaker, she felt competent in recognizing this species. She chose suitable settings for the nets, handled the bats, and made identifications. One project also included dissection of several species of bats, an area in which she felt very competent. This work was completed in Missouri, West Virginia, Virginia, Tennessee, Kentucky, and Ohio.

Summer 2003: Contract Work – Ackenheil Engineers Geologists, Inc.

Ms. Burke completed a survey for bats in some old, abandoned mine shafts. She used a bat detector and personal observation to compile a report for this company, so that reclamation could begin.

Summer 2002: Wildlife Biologist - National Forest Service

Ms. Burke worked with a Multispecies Monitoring Team as a member of the bat crew. My work involved choosing suitable bat habitat, which included work with a GPS unit and topographical maps, setting up mist nets, identifying captured bats, and recording data. Ms. Burke identified approximately 350 bats over this period of time (nearly a year). She also assisted in using a Pettersson bat detector and analyzing this information with a software package, Sona-Bat. A new

component, habitat assessment, was added to this project mid-season. For this assessment, work with vegetation was carried out using a Biltmore stick, clinometer, densiometer, and several measuring tapes. This entire project was located in the wilderness of the Lake Tahoe Basin, California, and often included extreme hiking/camping. Ms. Burke has received CPR certification and a National Forest Service driver's license.

Fall 2000 to Spring 2002: Graduate Assistant – Marshall Community and Technical College

Ms. Burke work involved various office duties. Ms. Burke worked with several people, and assisted with accreditation, administration of tests, off-campus programs, and the advising center.

Summer 2001: Contract Work – Compliance Monitoring Laboratories, Inc.

Ms. Burke's work with this biological testing company involved knowledge of bat habitat, setting up of nets, and mist netting which included identification and gathering/recording of bat data. Ms. Burke was hired to oversee a crew of workers and was responsible for the removal of bats from the nets. Approximately ten bats were captured and positively identified not to be Indiana bats. Ms. Burke also made identifications and took measurements of the bats taken in the nets.

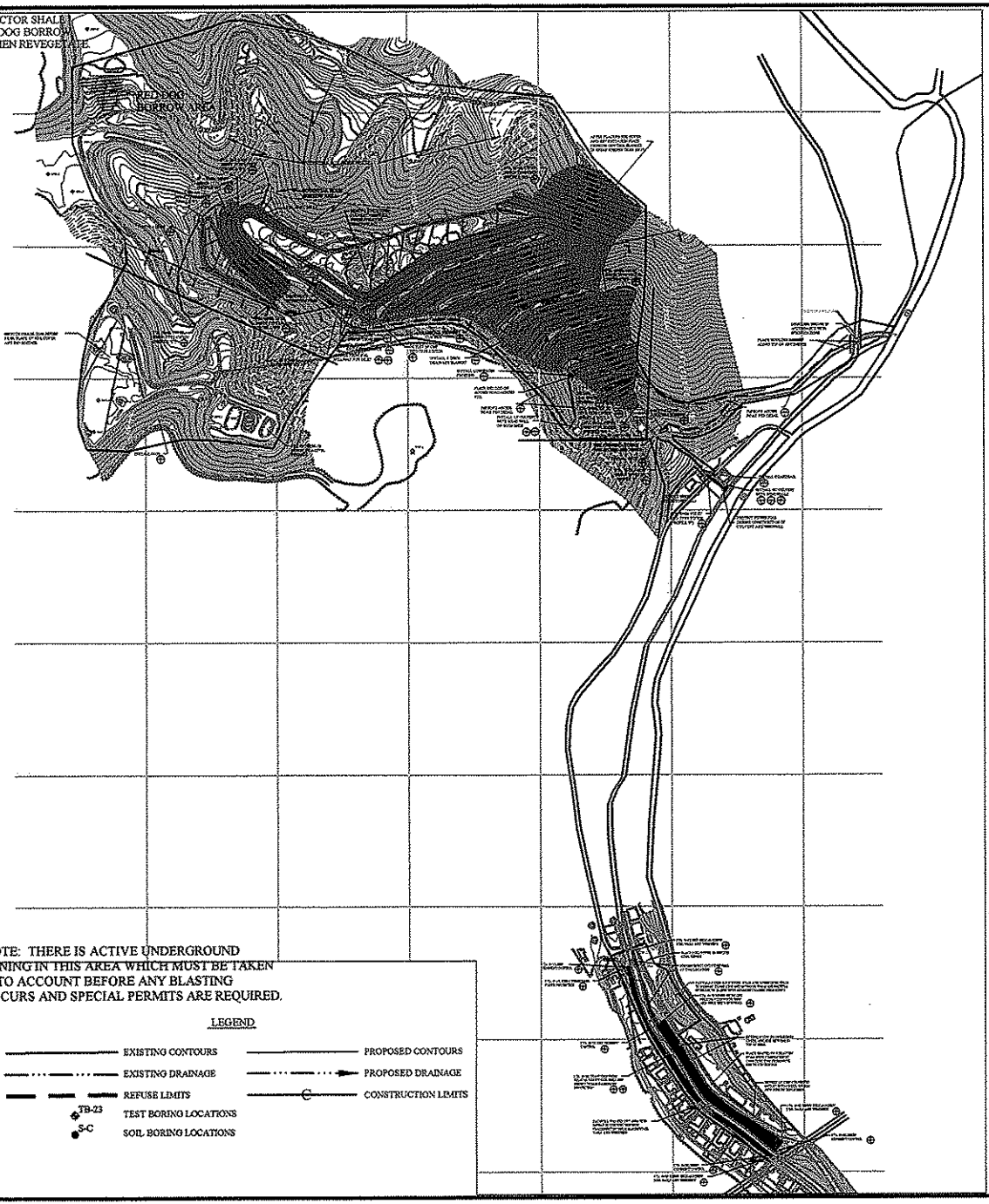
Summer 2000: Marshall University Capstone Project

Ms. Burke conducted a research project involving a search for Rafinesque's big-eared bat (*Corynorhinus rafinesquii*) in Nicholas County, WV. This study involved knowledge of habitat, contact and questioning of local residents regarding bat activity, identification of the bat, and recording activity. Roughly four species were identified, excluding Rafinesque's big-eared bat. The previous location for the county record was searched with no sign of the bat in question. Ms. Burke obtained a rabies vaccination for this project.

Island Creek #18 Mine Complex

- Example Project

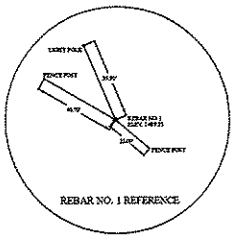
NOTE: THE CONTRACTOR SHALL BACKFILL THE RED DOG BORROW AREA WITH SOIL, THEN REVEGETATE.

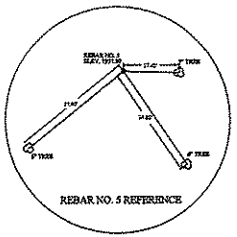


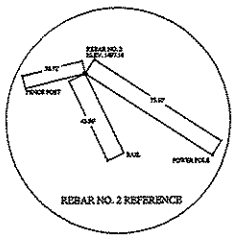
NOTE: THERE IS ACTIVE UNDERGROUND MINING IN THIS AREA WHICH MUST BE TAKEN INTO ACCOUNT BEFORE ANY BLASTING OCCURS AND SPECIAL PERMITS ARE REQUIRED.

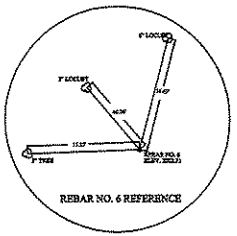
LEGEND

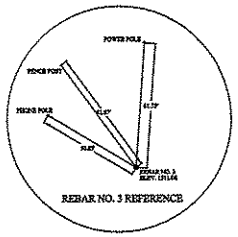
- EXISTING CONTOURS
- PROPOSED CONTOURS
- EXISTING DRAINAGE
- PROPOSED DRAINAGE
- REFUSE LIMITS
- CONSTRUCTION LIMITS
- TB-23 TEST BORING LOCATIONS
- S-C SOIL BORING LOCATIONS

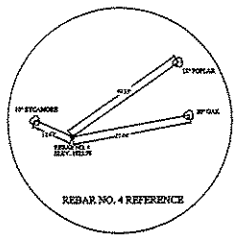












BASELINE LAYOUT

POINT	STATION	ELEV.	COORDINATES
REBAR 1	0+00.00	1489.33	N 157540.65 E 1820358.59
REBAR 2	3+09.86	1497.16	N 157738.57 E 1820120.18
REBAR 3	9+51.14	1511.06	N 158294.05 E 1819799.74
REBAR 4	37+83.46	1923.78	N 160990.18 E 1819723.40
REBAR 5	25+86.43	1957.30	N 160736.53 E 1818553.55
REBAR 6	20+00.00	2002.31	N 160973.16 E 1818016.99

TOPOGRAPHIC MAPPING WAS PREPARED BY PENTREE, INC. AND WAS SUPPLEMENTED BY ACKENHEIL ENGINEERS AND GEOLOGISTS, INC.

200' 0' 200' 400'

ACKENHEIL ENGINEERS GEOLOGISTS

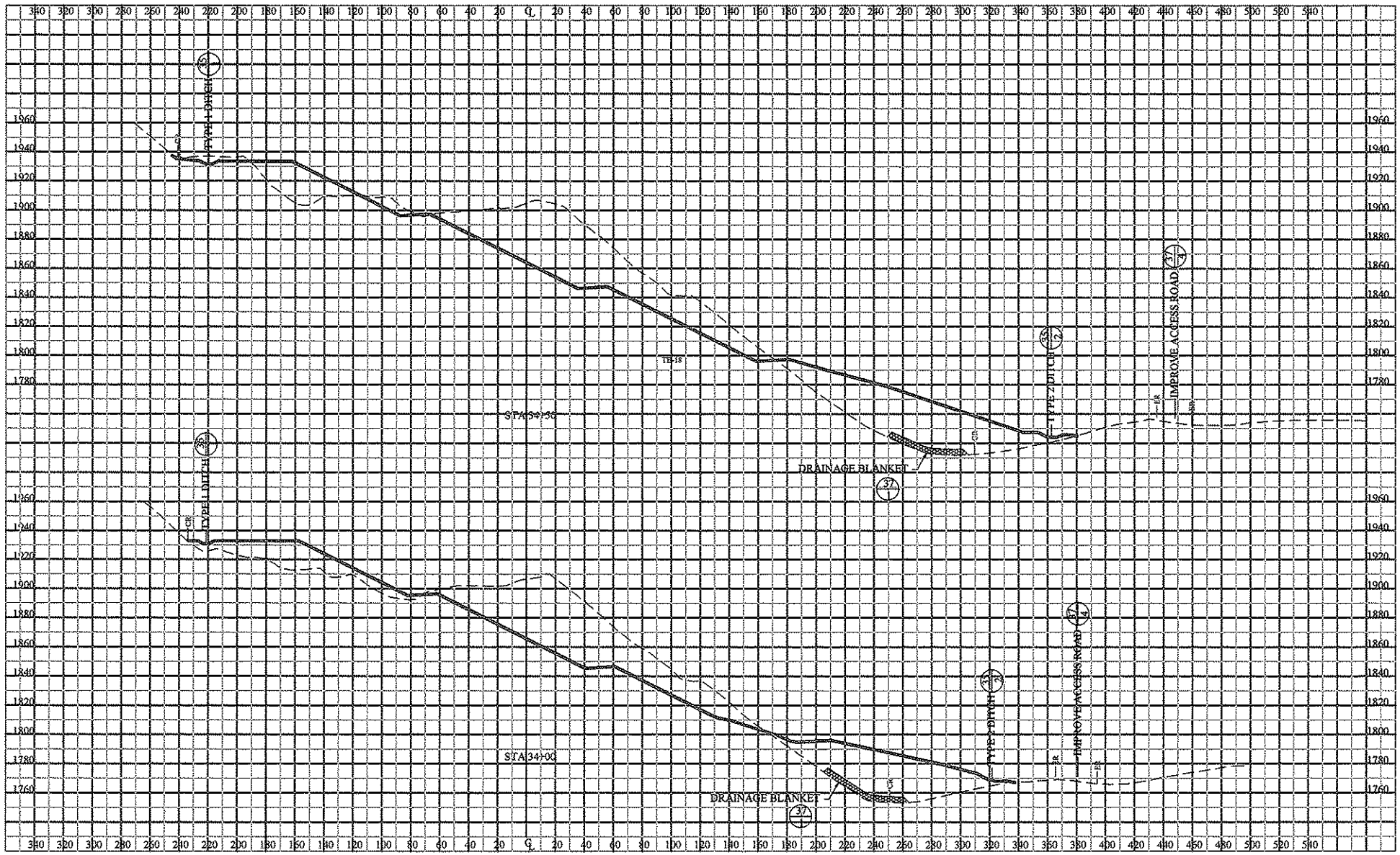
SCALE: 1" = 200'	DATE: FEBRUARY 25, 2005
DRAWN BY: GAW	CHECKED BY: CAL
REVISED DATES	
JUNE 2, 2005	
JUNE 17, 2005	
DECEMBER 9, 2005	

CARSWELL ERODING REFUSE

PROJECT NO.: 04072

COMPOSITE SITE PLAN

SHEET NO. 2 OF 46



LEGEND

- EXISTING GRADE
- PROPOSED GRADE
- 12" SOIL COVER
- ER — EDGE OF ROAD
- CR — COAL REFUSE LIMITS

ACKENHEIL ENGINEERS GEOLOGISTS

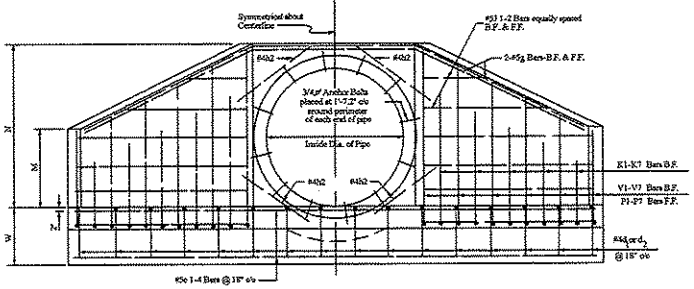
SCALE: 1" = 30'	DATE: FEBRUARY 25, 2005
DRAWN BY: GAW	CHECKED BY: CAL
REVISED DATES	
JUNE 2, 2005	

CARSWELL ERODING REFUSE

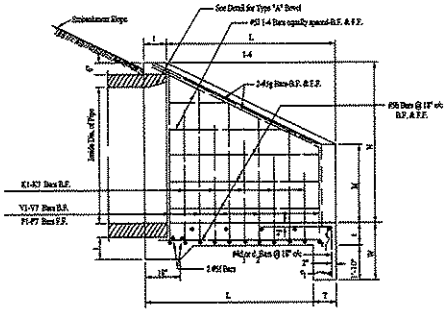
PROJECT NO.: 04072

CROSS SECTIONS STA. 34+00 THRU 34+50

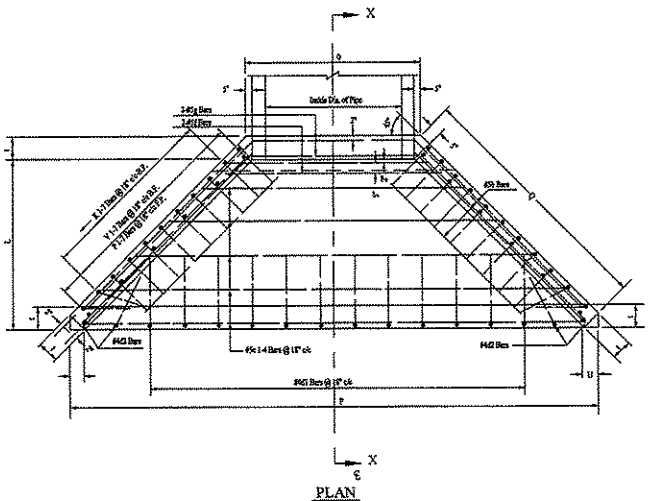
SHEET NO. 24 OF 46



END VIEW



SECTION X-X

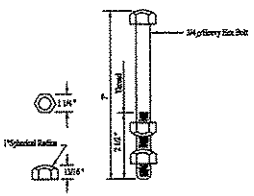


PLAN

NOTES

B.F. DENOTES BACK FACE

F.F. DENOTES FRONT FACE

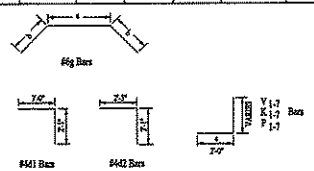


ANCHOR BOLT DETAIL

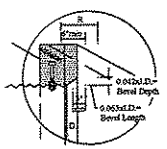
38/1

WINGWALL DETAILS

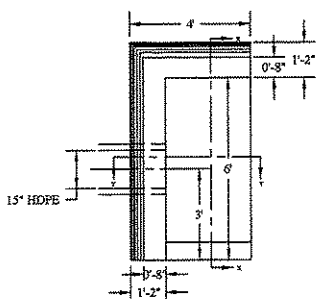
I.D. PIPE	FILL SLOPE	DIMENSIONS							REINFORCEMENT							
		L	M	N	O	P	Q	T	MK	SIZE	NO.	a	b	TOTAL	SPAC.	TYPE
66"	2:1	6'-9"	3'-5"	6'-7"	7'-5"	21'-6"	9'-11"	12"	D1	4	11			5'-1"	18" cc	BENT
									D2	4	4			4'-4"	18" cc	BENT
									E1	5	2			21'-0"	18" cc	STR.
									E2	5	1			18'-11"	18" cc	STR.
									E3	5	1			15'-11"	18" cc	STR.
									E4	5	1			12'-11"	18" cc	STR.
									F	5	2			9'-4"	5" cc	STR.
									G	5	4	7'-0"	10'-11"	28'-10"		BENT
									H	5	18			9'-3"		STR.
									V1	5	2	2'-0"	3'-11	5'-11"	18" cc	BENT
									THRU			6" INCREMENTS				
									V6	5	2	2'-0"	6'-5"	8'-5"	18" cc	BENT
									V7	6	2	2'-0"	6'-11"	8'-11"	18" cc	BENT
									H2	4	8			4'-4"		STR.
									K1	5	2	2'-0"	2'-7"	4'-7"	18" cc	BENT
									THRU			6" INCREMENTS				
									K6	5	2	2'-0"	5'-1"	7'-1"	18" cc	BENT
									K7	6	2	2'-0"	5'-7"	7'-7"	18" cc	BENT
									P1	5	2	2'-0"	3'-11"	5'-11"	18" cc	BENT
									THRU			6" INCREMENTS				
									P7	5	2	2'-0"	6'-11"	8'-11"	18" cc	BENT
									J1	5	4			1'-2"	18" cc	STR.
									J2	5	4			2'-4"	18" cc	STR.



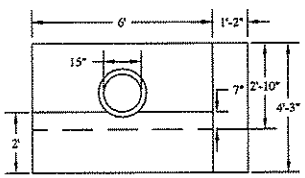
DETAIL OF BENT BARS



ANCHOR BOLT AND BEVEL DETAIL



PLAN VIEW

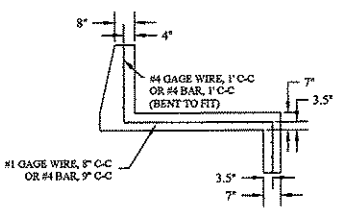


ELEVATION

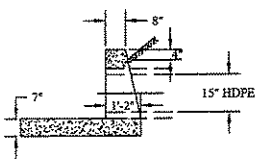
38/2

HEADWALL DETAILS

SCALE: 1" = 2'



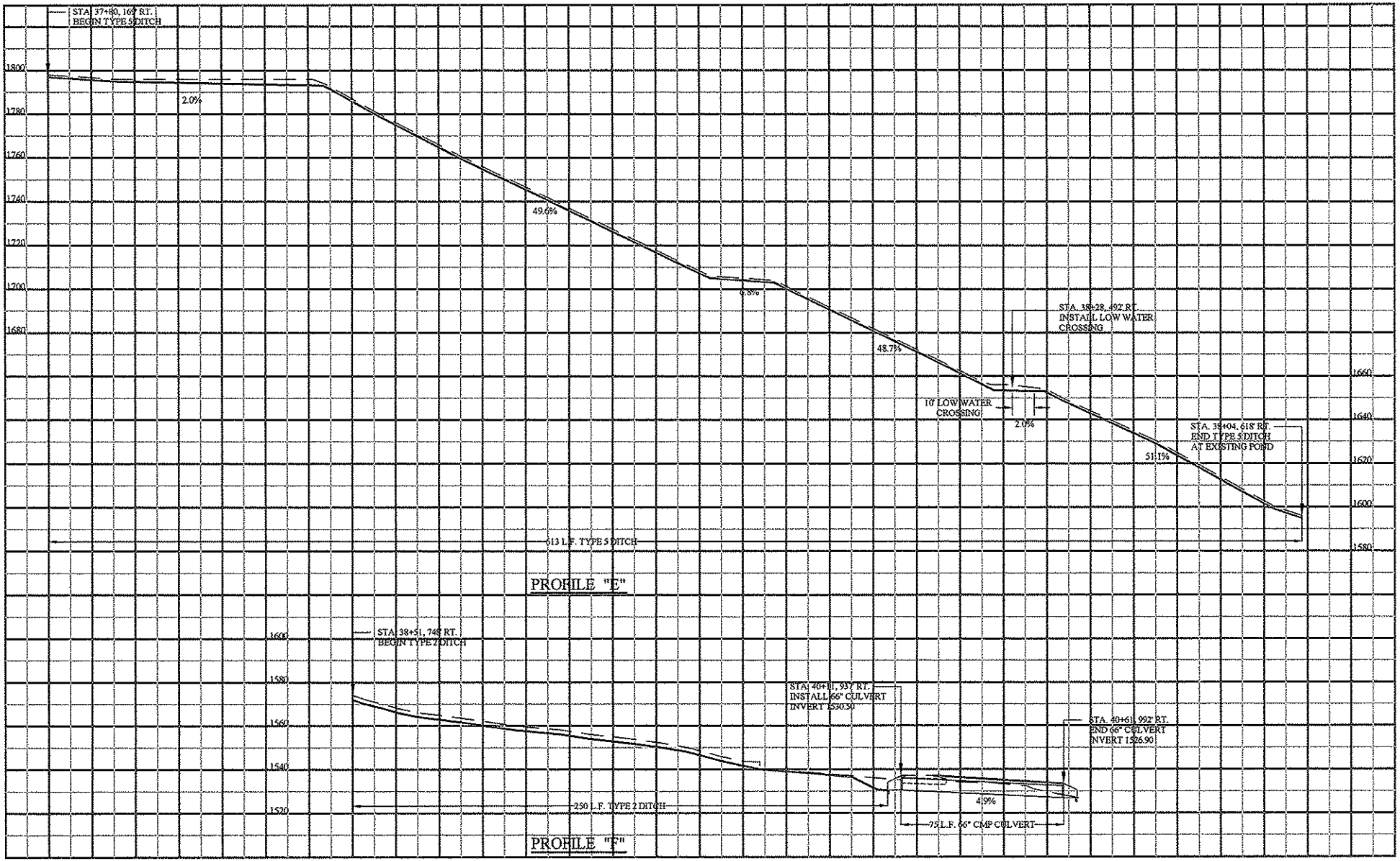
SECTION X - X



SECTION Y - Y

ACKENHEIL ENGINEERS GEOLOGISTS

SCALE: AS SHOWN	DATE: FEBRUARY 25, 2005	CARSWELL ERODING REFUSE	PROJECT NO.: 04072
DRAWN BY: GAW	CHECKED BY: CAL		
REVISED DATES			
JUNE 2, 2005		CONSTRUCTION DETAILS	SHEET NO. 38 OF 46



LEGEND

EXISTING GRADE

PROPOSED GRADE

ACKENHEIL ENGINEERS GEOLOGISTS

SCALE: 1" = 20'	DATE: FEBRUARY 25, 2005
DRAWN BY: GAW	CHECKED BY: CAL
REVISED DATES	
JUNE 2, 2005	
JUNE 17, 2005	

CARSWELL ERODING REFUSE

PROJECT NO.: 04072

DRAINAGE PROFILES

SHEET NO. 42 OF 46