West Virginia
Department of Environmental Protection

LICENSED REMEDIATION SPECIALIST

PROGRAM GUIDE

June 2020

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LRS Program

OVERVIEW

Remediation of sites in the West Virginia Voluntary Remediation Program and UECA-LUST Program must be supervised by a Licensed Remediation Specialist (LRS). An LRS is an individual certified by the West Virginia Department of Environmental Protection (WVDEP) as qualified to supervise the assessment and remediation of contaminated sites. Licensed Remediation Specialists must meet minimum education and experience requirements, pass an examination administered by the WVDEP, and obtain continuing education. See the LRS Process Flowchart in Appendix A for an outline of steps necessary from LRS application through renewal.

The LRS is employed by the Voluntary Remediation Program or UECA-LUST Program applicant at usual and customary professional rates. However, the LRS must be completely objective in developing and reviewing workplans, reports, and opinions. The LRS represents the interests of the public, in addition to providing technical supervision of all remedial activities. It is the Licensed Remediation Specialist's duty to protect the safety, health, and welfare of the public in the performance of his or her professional duties.

One LRS is responsible for supervision of all site remediation activities. However, due to the nature of complex contaminated sites, it is unlikely that a single individual will have the skills and knowledge to perform all activities associated with the remediation. In these circumstances, the LRS must only perform assignments for which he or she is qualified by training and/or experience in those specific technical fields. The LRS will seek assistance from other qualified professionals as needed in performing work at the site.

The LRS Program was established by the Voluntary Remediation and Redevelopment Act (W. Va. Code § 22-22-1, et seq.) and is outlined in the Voluntary Remediation and Redevelopment Rule (60CSR3).

RESPONSIBILITIES OF THE LRS

Specific areas of professional responsibility of the LRS are as follows:

1. The LRS is responsible for any release of contaminants during assessment and remediation activities undertaken pursuant to and contemplated in the approved remediation agreement, work plans, or reports.

2. Where a release of contaminants in excess of those identified in the work plan occurs at the site during remediation activities, the LRS shall immediately notify WVDEP, unless the release does not exceed reportable quantities found in 40 CFR Part 302.

3. The LRS shall only perform assignments for which the specialist is qualified by training and experience in those specific technical fields.

4. The LRS shall be objective in work plans, reports, and opinions and avoid any conflict of interest with employer, clients, and suppliers.

5. The LRS shall not solicit or accept gratuities, directly or indirectly, from contractors, agents, and other parties dealing directly with the employer or client in regard to professional services the specialist is performing at the work site.

6. The LRS shall not accept any type of bribe, falsify or permit misrepresentation of professional qualifications, intentionally provide false information to WVDEP, or knowingly associate with one who is engaging in business or professional practices of fraudulent or dishonest nature.

7. The LRS shall not charge any special fees above usual and customary professional rates for being licensed.

FEES

Application Fee:	$500
Examination Fee:	$500
Biennial Renewal Fee:	$400

All checks should be made payable to the West Virginia Department of Environmental Protection, with a memo for deposit into the Voluntary Remediation Administrative Fund.

Education and Experience Requirements

Licensed Remediation Specialist candidates may meet minimum education and experience requirements through either the standard track or the alternative track as defined in the Voluntary Remediation and Redevelopment Rule (60CSR3).

- The standard track is for an individual who has earned a baccalaureate, master's, or doctorate degree from an accredited higher education institution.
- The alternative track is for an individual who has earned at least a high school diploma but does not meet the requirements for the standard track.

A full summary of education and experience requirements is provided in the following table.

EDUCATION AND EXPERIENCE REQUIREMENTS

Minimum Education and Experience Requirements		
	Standard Track	**Alternative Track**
Education	Baccalaureate, Master's, or Doctorate Degree in one of the following academic areas: • Biology • Chemistry • Earth Sciences • Engineering • Geology • Hazardous Waste Management • Hydrogeology • Microbiology • Risk Assessment • Soil Sciences • Toxicology • Scientific Subdiscipline of Public Health • Curriculum determined to be equivalent by WVDEP	High School Diploma
Experience	Six (6) years of relevant professional experience*, one (1) of which is supervisory or project management related	Ten (10) years of relevant professional experience*, one (1) of which is supervisory or project management related
Experience Substitution Credits	For degrees in an acceptable academic area: • One (1) year credit for each Master's Degree • Two (2) years credit for a Doctorate Degree	For degrees in an acceptable academic area: • One-half (1/2) year credit for each Associate Degree

*Relevant professional experience shall include, at a minimum, practical knowledge of the following:

1. Remediation activities
2. Procedures necessary to remediate a site
3. Management of contaminants at a site, including, but not limited to:
   - Site investigation
   - Health and safety protocol
   - Quality assurance
4. Feasibility studies
5. Remedial design

Work performed during a period of full-time undergraduate study at an educational institution is considered part of the education program and is not acceptable relevant professional experience. However, work performed for a period of at least two and one-half consecutive months per calendar year when not enrolled as a full-time student may be accepted as relevant professional experience, provided that the individual did not receive college credits for that work.

Application

CONTENT

Every application must include a listing of educational history, a description of relevant professional experience, and three professional references. Evidence of any degrees earned from accredited educational institutions which demonstrate ability to meet minimum education requirements must be attached; evidence may be in the form of copies of degrees or transcripts.

An example application is presented in Appendix B. Not all applications will be as extensive as the example, but all applications should reflect a similar level of detail.

RECOMMENDATIONS FOR COMPLETION

A complete and well-documented application is an important step in the licensure process. The following recommendations should be followed to ensure an acceptable application:

1. Do not delegate the task of completing an application to an assistant who may use a generalized employment resume as the source of information. The application should be completed by the applicant and clearly describe professional experience.
2. Thoroughly review the educational and professional experience requirements for licensure and ensure that the application describes experience in each area.
3. Provide ample detail about work experience, not general statements such as "has extensive experience in remediation activities."
4. Clearly show years of relevant professional experience. It is not necessary to identify clients.

SUBMITTAL

Applications are to be completed and submitted online through the WVDEP Office of Environmental Remediation webpage. The online application may be completed at one time or over a period of time. Information may be edited, added, or deleted until the application is officially submitted.

Upon submission, WVDEP will provide notification of approval within 15 days.

Examination

FREQUENCY

The LRS Examination is administered twice annually, during the months of March and September, to all individuals who have submitted applications meeting the education and experience requirements for licensure, received notification of application approval, and paid examination fees. All examinations are held at the West Virginia Capitol Complex, Building 7, Second Floor, Technology Learning Center, located near the corner of Piedmont Road and California Avenue in Charleston, WV, unless noted otherwise.

Refer to the Office of Environmental Remediation webpage for information on the next scheduled LRS Examination:

https://dep.wv.gov/dlr/oer/brownfieldsection/LRS%20Program/Pages/default.aspx

CONTENT

The LRS Examination tests overall regulatory understanding of relevant state and federal regulations and related written policies, as well as overall technical understanding of basic concepts and methods in those scientific and technical fields related to assessment, containment, and remediation actions.

Specific topics that may be covered in the test include:

- Chemistry
- Environmental Sciences
- Geology/Hydrogeology
- Health and Safety
- LRS Program and Responsibilities
- Project Management
- Remediation Technologies
- Risk Assessment
- Sampling Methodology and Statistics
- Voluntary Remediation Program Processes and Requirements

Material from the following WVDEP publications may be included on the exam:

EXAMINATION

- West Virginia Voluntary Remediation Program Guidance Manual
- WVDEP-OER Quality Assurance Program Plan (QAPP)

Applicants should have a thorough knowledge of the requirements of the following statutes and regulations:

- Monitoring Well Design Standards (W. Va. Legislative Rule 47CSR60)
- Monitoring Well Rules (W. Va. Legislative Rule 47CSR59)
- Voluntary Remediation and Redevelopment Act (W. Va. Code § 22-22)
- Voluntary Remediation and Redevelopment Rule (W. Va. Legislative Rule 60CSR3)

Applicants should be generally familiar with the following statutes and regulations:

- Air Pollution Control Act (W. Va. Code § 22-5)
- Groundwater Protection Act (W. Va. Code § 22-12)
- Hazardous Waste Management Act (W. Va. Code § 22-22-18)
- Occupational Safety and Health Act (29 U.S.C. § 651 to 678)
- Resource Conservation and Recovery Act (42 U.S.C. § 6901)
- Section 103(a) of the Comprehensive Environmental Response, Compensation, and Liability Act (42 U.S.C. § 9603(a))
- Section 304 of the Emergency Planning and Community Right-to-Know Act (42 U.S.C. § 11001 to 11050)
- Solid Waste Management Act (W. Va. Code § 22-15)
- Toxic Substances Control Act (15 U.S.C. § 2601)
- Water Pollution Control Act (W. Va. Code § 22-11)

Sample examination questions are presented in Appendix C.

FORMAT AND SCORING

The LRS Examination consists of 75 multiple choice questions, and candidates are allowed two hours for completion. Each question is worth one point. Scores are determined by the number of questions answered correctly, and no points are deducted for incorrect answers. Candidates must have a passing score of at least 70% in order to be licensed.

EXAMINATION

WHAT TO BRING

Candidates must bring a valid government-issued identification and at least one No. 2 pencil. No other materials or resources, including books, calculators, cell phones, and notes, may be present in the examination room.

POST-EXAMINATION GRADE NOTIFICATION

WVDEP will deliver grade results via email to each candidate within thirty days of the examination date. Examination papers will not be returned.

REPEAT EXAMINATIONS

Candidates who fail to achieve a passing score on the examination may take a subsequent examination within two years after the date the individual's application was approved. Candidates wishing to repeat the examination must submit a letter stating their intention to take a subsequent examination and pay the examination fee again.

If a candidate does not take the examination within two years after the date the individual's application was approved, the candidate must resubmit his or her application.

EMERGENCY CIRCUMSTANCES AND MAKE-UP EXAMINATIONS

The examination fee is non-refundable, except when the candidate can demonstrate that his or her failure to appear for the examination was due to circumstances beyond his or her reasonable control, in which case the candidate may either request a refund or request WVDEP hold open his or her application until he or she can take a subsequent examination. The candidate must take the make-up examination within two years after the date the individual's application was approved.

License Renewal and Continuing Education

LICENSE RENEWAL

An LRS in good standing may have his or her license renewed every two years. WVDEP will provide a license renewal notice to the LRS 90 days prior to his or her license expiration. Any individual who fails to renew his or her license may not continue to practice as an LRS after the day of license expiration. Any individual who fails to renew his or her license within 30 days of the expiration must reapply for examination and is subject to the same requirements as a new applicant.

CONTINUING EDUCATION REQUIREMENT

Licensed Remediation Specialists must obtain twelve professional development hours every two (2) years to be eligible for license renewal.

- Two (2) of the twelve required professional development hours must be earned during each license renewal period by successfully completing West Virginia Voluntary Remediation Program training conducted by WVDEP. This required training is an annual, one-hour online training administered during the fourth quarter of each year via West Virginia's Technology Learning Center. The training website will be emailed to all Licensed Remediation Specialists, and the training will be available to complete at any time during the fourth quarter.

- The remaining ten (10) professional development hours may be earned by attending and successfully completing college courses, continuing education courses, seminars, workshops, and conferences pertaining to investigation, assessment, or remediation of hazardous substances or petroleum. Webinars and safety training do not meet the requirement for continuing education.

Appropriate topics of continuing education include:

- Environmental Chemistry
- Environmental Forensics
- Environmental Law
- Geology / Hydrogeology / Soil Science
- Modeling and Mapping
- Project Management

- Remedial Options and Techniques
- Risk Assessment
- Site Investigation
- Vapor Intrusion
- Other topics as approved by the Division of Land Restoration Director

Professional development hours are calculated as follows:

Type of Continuing Education	Professional Development Hours
1 hour of attendance at a seminar, workshop, or professional or technical presentation at a meeting, convention, or conference	1
1 continuing education unit (CEU)	10
1 college quarter hour	15
1 college semester hour	20

CONTINUING EDUCATION SUBMISSION

Licensed Remediation Specialists must submit evidence of continuing education on the LRS License Renewal Form. Documents used to support professional development hours, such as certificates, course descriptions, training agendas, conference programs, etc., must be attached to the LRS License Renewal Form.

If an LRS is unsure whether their continuing education is acceptable, he or she is encouraged to email DEPLRSProgram@wv.gov for pre-approval, rather than wait until submission of the LRS License Renewal Form immediately before license expiration.

The LRS License Renewal Form is presented in Appendix D.

CONTINUING EDUCATION REQUIREMENT EXCEPTIONS

The West Virginia Department of Environmental Protection may excuse or modify the continuing education requirements for any certification period if an LRS demonstrates that he or she is unable to complete the minimum requirements due to health reasons, as certified by a medical doctor, or active service in the United States Armed Forces.

LICENSE RENEWAL AND CONTINUING EDUCATION

CONTACT INFORMATION UPDATES

To ensure that license renewal notices and all other communications are received timely, an LRS should contact WVDEP whenever a change in contact information occurs. Contact information updates should be sent via email to DEPLRSProgram@wv.gov.

Regulation and Enforcement of Licenses

OVERVIEW

It is the Licensed Remediation Specialist's duty to protect the health, safety, and welfare of the public in the performance of his or her professional duties, and the LRS is legally required to notify WVDEP if there is a threat to the environment or the health, safety, or welfare of the public. If an LRS faces a situation where he or she is unable to meet their duties and responsibilities, the LRS may either sever the relationship with the client or employer or refuse professional responsibility for work plan, report, or design.

The West Virginia Department of Environmental is responsible for enforcing these duties and responsibilities and regulating licenses. If WVDEP, upon inspection, investigation, or through other means, observes, discovers, or learns that an LRS has committed violations, appropriate actions will be taken in accordance with W. Va. Code § 22-22-12 and 60CSR3 §§ 60-3-5.5 through 60-3-5.9. All complaints received from concerned applicants, community members, or other stakeholders will be considered and investigated.

SUSPENSION AND REVOCATION OF LICENSES

The West Virginia Department of Environmental Protection may revoke a license, suspend a license for not more than five years, or impose lesser sanctions as appropriate for acts or omissions in violation of the Voluntary Remediation and Redevelopment Act (W. Va. Code § 22-22-1, et seq.) or Voluntary Remediation and Redevelopment Rule (60CSR3).

A license issued to an LRS may be suspended, revoked, or deemed ineligible for renewal for the following reasons:

- For fraud by the LRS in the license application process.
- For fraud, dishonesty, intentional misrepresentation, or gross incompetence by the LRS in the performance of any work required in a work plan or pursuant to a Voluntary Remediation Agreement.
- For any act by the LRS in violation of the Voluntary Remediation and Redevelopment Act (W. Va. Code § 22-22-1, et seq.) or Voluntary Remediation and Redevelopment Rule (60CSR3).

REGULATION AND ENFORCEMENT OF LICENSES

Any LRS receiving a Notice of Intent to Suspend or Revoke a License has the right to request an informal conference and formal hearing, be represented by counsel, and appeal a final order or ruling. A full description of the process may be found in the Voluntary Remediation and Redevelopment Rule (60CSR3), §§ 60-3-5.5.b through 60-3-5.9.

CRIMINAL PENALTIES

The West Virginia Department of Environmental Protection may request the prosecuting attorney of the county in which an alleged violation occurs bring a criminal action. If an LRS fraudulently misrepresents work that has been completed and such actions results in an unjustified and inexcusable disregard for the safety of others, therefore placing another in imminent danger or contributing to ongoing harm to the environment, he or she may be found guilty of a felony. Upon conviction, the LRS may be:

- Fined not more than $50,000
- Imprisoned not less than one nor more than two years
- Both fined and imprisoned

LRS Program Contact Information

The LRS Program is administered by the Office of Environmental Remediation within the Division of Land Restoration at the West Virginia Department of Environmental Protection.

Questions about the LRS Program may be directed to the Office of Environmental Remediation:

Office of Environmental Remediation
304-926-0499
DEPLRSProgram@wv.gov
https://dep.wv.gov/dlr/oer/Pages/default.aspx

West Virginia Department of Environmental Protection
601 57th Street SE
Charleston, WV 25304
www.dep.wv.gov

APPENDICES

Appendices

Appendix A: LRS Process Flowchart

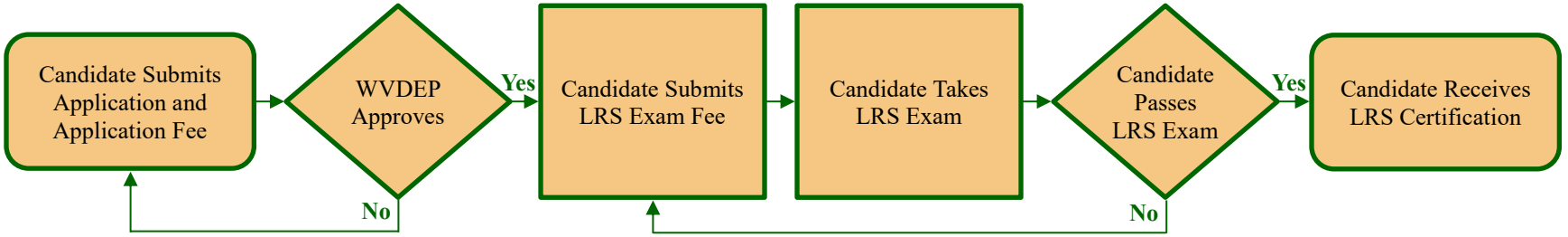
Appendix B: Example LRS Application

Appendix C: Sample LRS Examination Questions

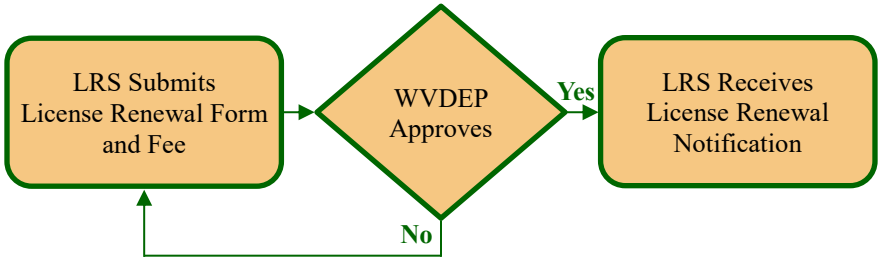
Appendix D: LRS License Renewal Form

APPENDIX A: LRS PROCESS FLOWCHART

Initial License



License Renewal (every two years)



APPENDIX B: EXAMPLE LRS APPLICATION

WVDEP Licensed Remediation Specialist Application

Contact Information

NAME	COMPANY		
Jamie R. Smith	EnviroConsulting LLC		
EMAIL	PHONE	FAX	
jrsmith@enviro.com	555-555-1234	555-555-5678	
ADDRESS	CITY	STATE	ZIP
2345 Skyline Tower – Suite 350	Charleston	WV	25304

Education

BEGIN DATE	END DATE	INSTITUTION
9/1/1998	5/20/2002	Concord University
FIELD(S) OF STUDY		DEGREE EARNED
Geology		Bachelor of Science
BEGIN DATE	END DATE	INSTITUTION
9/1/2002	5/20/2005	West Virginia University
FIELD(S) OF STUDY		DEGREE EARNED
Geology		Master of Science

Experience

BEGIN DATE	END DATE	JOB TITLE	# SUPERVISED
9/1/2005	10/1/2008	Geologist	5
EMPLOYER		CITY	STATE
ABC Environmental Services		Columbia	SC

DETAILS

October 2005 to February 2006: I ran the ECTRAN groundwater contaminant transport model to determine primary remediation goals (PRG's) for several Navy facilities including Dahlgren, Key West, and Jacksonville. Prepared environmental site assessment report for Naval Air Station Jacksonville, Florida. Provided geologic support for watershed delineation at White Oak Naval facility, Maryland. Attended 40-hour hazardous waste operations (HAZWOPER) training.

February 9-11, 2007: Marine Corps Combat Development Command (MCCDC) Quantico, VA. HREM survey of three sites: Pesticide Burial Area, Arsenic Burial Area, and Fire Training Area. Survey utilized Geonics EM-31 and EM-38 to screen for subsurface anomalies. Utilized GPS in conjunction with survey to eliminate need for reference grid and follow-on land surveying services.

February 24-26, 2007: Naval Weapons Station Charleston, SC. Conducted GPS Survey of over 100 environmental sampling points.

EXAMPLE LRS APPLICATION

March 17-19, 2007: MCCDC Quantico, VA. Inspected 10 test pits at Site 4-Old Landfill during remediation of the site. Also sampled environmental media in situ to verify whether contaminant release to the adjacent Potomac River had occurred. Prepared cross sections and test pit logs.

March 24, 2007 to June 28, 2007: Allied Signal Chromium Sites, Jersey City, NJ. Provided inspection services for over 4600 feet of drilling by direct push technology (3193 feet) and hollow stem auguring (1474 feet). Prepared subsurface cross sections and boring logs to aid in the delineation of chromium ore fill placed during World War II era industrial activities. Encountered fill, meadow mat (a local marker bed, also an aquitard), and glacial till. Selected sampling intervals for environmental media. Determined monitoring well screen intervals for 20 wells.

July 26, 2007 to August 20, 2007: Indian Head / Stump Neck Annex Naval Facilities, Stump Neck, MD. Provided inspection services for 125 feet of drilling in Aquia Formation. Selected sampling intervals for environmental media. Determined monitoring well screen intervals. Conducted low flow purging and sampling of monitoring wells. Prepared cross sections and boring logs.

August 27-29, 2007: Flying J Corporation, Lamar, PA. Conducted a field reconnaissance to evaluate a ten-acre tract for the presence of potential sources of environmental contamination and liability. Performed the subsurface investigation and sampling with a direct push technology (DPT) rig (50 feet of boring). Prepared cross sections and logs. Encountered residual soils of the Axeman Formation.

September 2, 2007 to October 27, 2007: MCCDC Quantico, VA. Field Operations Leader/ Project Geologist for remedial investigation at five sites. Inspected 771 feet of borings at the Old Landfill, Pesticide Burial Area, and Old Batch Plant. Also inspected 120 lineal feet of test pits at the Pesticide Burial Area. Performed additional field reconnaissance of the Former Rifle Range and Arsenic Burial Area. Selected sampling intervals for environmental media. Determined monitoring well screen intervals. Conducted low flow purging and sampling of monitoring wells. Prepared cross sections and boring logs for report. Encountered soils of the Potomac and Aquia Formations.

October 29-31, 2007: Marine Corps Air Station (MCAS) Cherry Point, NC. Performed trouble shooting and reinitialized a non-functional air sparge/vapor extraction system at Bogue Field in a former fire training area. Collected potentiometric data and measured free product thickness for the existing well field. Collected air samples to evaluate system efficiency.

December 2-4, 2007: MCCDC Quantico, VA. Follow up HREM survey at Pesticide Burial Area. Survey utilized Geonics EM-31 and EM-38 to screen for subsurface anomalies. Utilized GPS in conjunction with survey to eliminate need for reference grid and follow-on land surveying services.

January 12-30, 2008: Marine Corps Air Station (MCAS) Cherry Point, NC. Solid Waste Management Unit (SWMU) Assessment, Sites 83 and 84, Former Pesticide Shop and Golf Course Maintenance Area. Field Operations Leader/Project Geologist responsible for overseeing contractor/subcontractor field crews for this SWMU assessment. Provided geologic support through the installation of borings (326 feet) and five wells. Prepared the results of the field activities for a site assessment report.

February 16-23, 2008: MCCDC Quantico, VA. Field Operations Leader/ Project Geologist for remedial investigation at the Arsenic Burial Area and Old Landfill sites. Inspected and logged 220 lineal feet of test pits at the Arsenic Burial Area. Prepared cross sections and logs. Encountered alluvial deposits adjacent to the Potomac River. Conducted low flow purging and sampling of tidally influenced wells at the Old Landfill. Sampling was performed at specific tidal intervals to assure representative samples were collected.

March 16-27, 2008: MCCDC Quantico, VA. Established site history for remedial investigation sites by researching archived documents, plans, and photographs. Conducted preliminary field reconnaissance of sites to identify areas of environmental concern, contaminant pathways, and potential boring locations. Collected environmental media samples to assess the offsite migration of contaminants from the Former Rifle Range area.

EXAMPLE LRS APPLICATION

April 5-8, 2008: Naval Air Station Dallas, TX. Performed GPS Survey of over 100 points. Use of GPS accelerated project schedule by negating the need for a follow on surveying sub-contractor.

April 20, 2008: Attended training seminar in use of Ashtec Glonass GPS system.

April 21-26, 2008: MCCDC Quantico, VA. HREM survey at 10 remedial investigation sites. Survey utilized Geonics EM-31 and EM-38 to screen for subsurface anomalies. Utilized GPS in conjunction with survey to eliminate need for reference grid and follow-on land surveying services.

May 16, 2008: Naval Air Station Dallas, TX. Performed GPS Survey of approximately 250 points. Use of GPS accelerated project schedule by negating the need for a follow on surveying sub-contractor.

June 1, 2008 to August 21, 2008: MCCDC Quantico, VA. Field Operations Leader/ Project Geologist for remedial investigations at 15 sites. Provided oversight and directed the efforts of field crew and two subcontractors. Inspected and logged 1227 lineal feet of borings at the various sites. Prepared cross sections and logs. Selected sampling intervals for environmental media. Determined monitoring well screen intervals. Conducted low flow purging and sampling of monitoring wells. Encountered soils of the Potomac and Aquia Formations. Prepared cross sections and boring logs for report.

August 24, 2008 to September 25, 2008: Prepared report of findings for the environmental investigations performed at MCCDC Quantico June through August above. Summarized field activities and presented analytical results in report. Prepared presentation for client and regulatory agencies.

September 28-30, 2008: Naval Submarine Base Groton, CT. Conducted existing monitoring well inventory and inspection at several locales on the base to assess the condition of the wells. Results were used to determine which wells were no longer serviceable and needed replaced.

BEGIN DATE	END DATE	JOB TITLE	# SUPERVISED
10/1/2008	**Present**	**Chief Geologist**	**8**

EMPLOYER	CITY	STATE
Tristate Environmental Engineering Services	**Wheeling**	**WV**

DETAILS

October 2008 to Present: Open-End Contract for Geotechnical Services, Work Order Number 1, Allegheny, Beaver, and Lawrence Counties, PA, Pennsylvania Department of Transportation (PENNDOT), District 11-0. Geotechnical Project Designer responsible for reviewing geotechnical work performed by other consultants, including subsurface investigation programs, laboratory testing programs, geotechnical engineering reports, foundation submissions, and environmentally sensitive waste evaluation studies. All work was reviewed for conformance with PENNDOT design manuals.

November 2008: Construction Drilling Services Agreement, Ellwood City, Butler County, PA, IA Construction. Geotechnical Project Designer for a small-scale boring program requested by the client to evaluate the feasibility of purchasing a parcel of land adjacent to their current limestone strip mining quarry operation. Provided boring inspection services to classify the lateral and vertical extent of the Vanport limestone.

November 2008: Streets Run Road Bridge Replacement Phase I Geotechnical Investigation, S.R. 2046, Section 010, Allegheny County, PA, Pennsylvania Department of Transportation, District 11-0. Geotechnical Project Designer responsible for performing site reconnaissance, reviewing existing information, relogging structure borings, preparing subsurface profiles and cross sections, and developing recommendations based on the collected data. In addition to the bridge replacement, the project includes one culvert, two cut slopes in soil and rock, and significant roadway realignment.

December 2008: Onyx Avenue Subsidence Investigation, Mount Oliver, Allegheny County, PA, U.S. Department of the Interior, Office of Surface Mining Reclamation and Enforcement (OSMRE). Geotechnical Project Designer responsible for investigating and analyzing damage to private residences to determine if the

damage resulted from abandoned coal mine subsidence. Duties included observing and inspecting the subsurface investigation, preparing detailed logs of the borings and site subsurface profiles, and analyzing and interpreting the subsurface information.

January 2009 to Present: Frazier Heights Galleria Mall, Allegheny County, PA, Frazier Heights Transportation Authority. Geotechnical Project Designer for the prefinal design phase of a new interchange along S.R. 0028 to service the proposed Galleria Mall at the same location. The project also involves the relocation of Tawney Run Road, the design of one box culvert and one retaining wall, construction through an ancient landslide, and related slope stability analyses. The Tawney Run Road relocation will impact several properties containing potentially contaminated materials. Responsibilities included performing a geologic analysis of existing subsurface data to delineate the boundaries of the ancient landslide, locating critical roadway sections to be used for stability analyses, converting previous data to metric units of measure, preparing field sampling and health and safety plans, and coordinating with other engineering firms responsible for construction adjacent to the proposed interchange.

January 2009 to February 2009: Smethport Wastewater Treatment Facility Improvements, Smethport, McKean County, PA, Borough of Smethport Authority. Geotechnical Project Designer responsible for preparing a technical report that provides geotechnical engineering recommendations for the design and construction of seven new structures at an existing wastewater treatment plant. Reviewed existing boring logs and interpreted subsurface conditions. Developed soil-strength parameters for use in the design of the structures. The report included recommendations for site preparation and overexcavation, lateral loads on structures, bearing capacity, settlement, and uplift conditions.

February 2009: Dewatering Investigation, Allegheny County, PA, Allegheny County Sanitary Authority (ALCOSAN). Geotechnical Project Designer for the design of four new clarifiers being added to a facility. The locations of the structures are in highly permeable fill overlying alluvial deposits adjacent to the Ohio River. A dewatering plan was necessary for the excavation and construction of the new structures; therefore, accurate hydraulic conductivity values for subsurface materials were needed. Duties included preparing a subsurface boring contract, developing project health and safety guidelines, performing multiple falling-head tests at each structure location, calculating hydraulic conductivity values for subsurface materials, overseeing geophysical subconsultant personnel, and presenting the results in a technical memorandum.

April 2009 to Present: Southern Beltway, Findlay Connector, PA Route 60 to S.R. 0022, Allegheny and Washington Counties, PA, Pennsylvania Turnpike Commission. Geotechnical Project Designer for the preliminary design of approximately seven miles of proposed toll highway between S.R. 0022 and the Southern Expressway (PA Route 60) at the Pittsburgh International Airport. The proposed alignment passes through several areas of potentially contaminated municipal landfills and former strip mines. Responsibilities included developing a subsurface investigation program to address both environmental and geotechnical design issues, creating field sampling plans for two environmental sites, preparing a project health and safety plan, characterizing the nature and extent of subsurface materials and contamination through the installation of soil borings and monitoring wells, and presenting the results in the prescribed report format. Additional responsibilities included developing treatment/remedial options for the environmental conditions encountered, as well as preliminary cost estimates for the various treatment options. The results of the field investigation were also presented to the Pennsylvania Department of Environmental Protection.

May 2009 to November 2009: Mon/Fayette Transportation Project, Washington County, PA, Pennsylvania Turnpike Commission. Geotechnical Project Designer for the construction phase of approximately 17 miles of a new toll highway extending from I-70 to S.R. 0051. Duties consisted of conducting a soil resistivity survey at a roadway lighting location near Haydentown and Finleyville. This information was used to develop a grounding plan for the site's electrical system.

July 2009: Construction Drilling Services Agreement, Plain Grove Township, Mercer County, PA, IA Construction. Geotechnical Project Designer for a small-scale boring program requested by the client to evaluate the feasibility of purchasing a parcel of land adjacent to their current sand and gravel pit operation. Provided boring inspection services to classify the lateral and vertical extent of subsurface glacial sand and gravel deposits.

EXAMPLE LRS APPLICATION

January 2010 to Present: S.R. 2040, Section A01, Curry Hollow Road Realignment, Phase II Detailed Alternatives Analysis, Allegheny County, PA, Pennsylvania Department of Transportation, District 11-0. Project Designer responsible for evaluating the shifting of approximately one mile of roadway. The purpose of the realignment is to improve visibility and motorist safety. Duties included performing detailed alternatives analyses at four locations along the roadway, determining the location of an alleged mine shaft adjacent to the roadway, and preparing a Phase II geotechnical engineering report. The investigation included preparing a boring plan, selecting soil and rock samples for laboratory testing, and performing stability analyses of cut slope, geogrid- reinforced slope, mechanically stabilized earth wall, and soldier pile and lagging wall design alternatives.

April 2010: S.R. 0008, Section A05, Mae West Bend, Allegheny County, PA, Pennsylvania Department of Transportation, District 11-0. Geotechnical Project Designer responsible for inspection services of approximately 4,000 feet of roadway relocation/improvement. Prepared geotechnical boring logs, cross sections and profiles in the field. Geotechnically challenging aspects included cut slopes in ancient colluvial landslides, anchored retaining wall design, recommendations for demolition of existing structures to avoid initiating landslides, and bridge foundation recommendations.

June 2010 to August 2010: East Bethlehem Wastewater Treatment Plant, Washington County, PA, East Bethlehem Township Municipal Authority. Geotechnical Project Designer responsible for foundation analyses and the design for sewage treatment plant service upgrades, including three new pump stations. The project involved evaluating a subsurface investigation, laboratory analyses of soil samples, and calculations of ultimate and allowable bearing pressures; performing settlement analyses; providing coefficients of lateral earth pressures; and calculating structure weights resistant to buoyant uplift for the soils beneath the proposed footings. The three pump stations are located in distinctly different geologic/hydrogeologic environments. During construction of the new facilities, evaluated and provided recommendations for modifying the contractor's ineffective dewatering plan.

July 2010 to August 2010: University of Pittsburgh Convocation Center, Mine Void Inspection, Allegheny County, PA, Commonwealth of Pennsylvania Department of General Services. Geotechnical Project Designer assigned to provide on-site construction inspection services for excavation activities encroaching on a former subsurface mine of the Pittsburgh coal seam. Observed the excavation of several collapsed mine entries and provided immediate recommendations to the contractor regarding how the entries and subsequent mine drainage should be treated to minimize construction schedule and budget impacts.

October 2010: S.R. 4003, Section B01, Bridge over Jordan Run, Beaver County, PA, Pennsylvania Department of Transportation, District 11-0. Geotechnical Project Designer responsible for geologic support for the geotechnical design of a CON/SPAN culvert measuring approximately ten meters in length to replace a deteriorated single-span bridge. The project involved subsurface investigation, laboratory testing, bearing capacity and settlement evaluation, footing elevation determination, approach slope configuration, geotechnical engineering report, and all required geotechnical special provisions and details.

January 2011 to Present: S.R. 3009, Section A03 and A04, Baptist Road Bridge Relocation, Phase II Detailed Alternatives Analysis, Allegheny County, PA, Pennsylvania Department of Transportation, District 11-0. Geotechnical Project Designer responsible for evaluating the geotechnical aspects of relocating a structure over railroad right-of-way approximately 100 feet from its current location. The structure shift will necessitate a shift in alignment of approximately 2,500 feet of roadway through a largely underdeveloped tract. Duties included preparing a subsurface investigation, performing a detailed alternatives analysis for the cut slope along most of the proposed alignment, and preparing a Phase II geotechnical engineering report. The investigation included preparing a boring plan; selecting soil samples for laboratory testing; and performing geotechnical evaluations of cut slopes, embankments, structure foundations, and storm water management facilities.

January 2011 to April 2011: S.R. 0030, Section, B07, Beaver County, PA, Pennsylvania Department of Transportation, District 11-0. Geotechnical Project Designer responsible for geologic support for the geotechnical design of approximately two miles of roadway relocation/improvement. Geotechnically challenging aspects included cut slopes in ancient colluvial landslides, embankment design in wetland areas, residential well impacts, and consideration for stream impacts.

EXAMPLE LRS APPLICATION

February 2011 to March 2011: S.R. 1032, Section B01, Railroad Street Pavement Rehabilitation, Phase I/Phase II Environmental Site Assessment (ESA), Beaver County, PA, Pennsylvania Department of Transportation, District 11-0. Geotechnical Project Designer responsible for evaluating the nature and extent of contamination beneath a portion of roadway in an industrial corridor, which is adjacent to a site being administered under the Pennsylvania Hazardous Sites Cleanup Act (HSCA). Duties included preparing a Phase I ESA, a site health and safety plan, a field sampling plan, and a Phase II ESA. Also provided boring inspection services, environmental sample collection and chain-of-custody submittals to a laboratory, and an interpretation of the sampling results.

February 2011 to April 2011: Midway Sewerage Treatment Plant, Washington County, PA, Midway Sewerage Authority. Geotechnical Project Designer responsible for foundation analyses associated with the design and construction of a proposed sewerage treatment plant. The proposed facility included five new structures: a pump station, a headworks building, two sequencing batch reactor basins, an ultraviolet disinfection building, and a control building. Remote pump station construction consisted of the installation of four remote pump station wet wells, access roads, and storage sheds. The project included the development and execution of a subsurface investigation and associated laboratory analyses of soil samples, the calculation of ultimate and allowable bearing pressures, settlement analyses, the estimation of lateral earth pressures, hydrostatic uplift evaluations, and the presentation of the findings and recommendations in a geotechnical report.

February 2011 to April 2011: S.R. 3088, Section A01, Hookstown Grade Road Bridge, Allegheny County, PA, Pennsylvania Department of Transportation, District 11-0. Geotechnical Project Designer responsible for the geotechnical design of a single-span adjacent box beam bridge measuring approximately ten meters in length to replace a deteriorated single-span bridge. The project involved subsurface investigation, laboratory testing, bearing capacity and settlement evaluation, footing elevation determination, approach slope configuration, rock- lined channel design for stream relocations, a geotechnical engineering report, and all required geotechnical special provisions and details.

March 2011: Woodmont Pump Station Subsurface Investigation, Martins Ferry, Belmont County, OH, City of Martins Ferry. Geotechnical Project Designer responsible for providing consulting engineering services to investigate the subsurface conditions under the pump station, which was showing symptoms of structural distress. Duties involved a field investigation, including inspecting the drilling of all borings; evaluations and the recommendation of improvements; and report preparation. A remedial alternatives report included supporting cost estimates for the City with possible solutions and recommendations to alleviate the subsurface problems. Specific duties involved conducting a field reconnaissance of the site, which revealed that the pump station was situated at the head of an active landslide; preparing field mapping, including the relevant cultural and landslide features; reviewing the subsurface data; and subsequently assisting with the development of a site conceptual geological model. Also provided recommendations regarding the mitigation of the structural stress on the pump station building due to the active slide.

April 2011: S.R. 3016, Section B02, Green Garden Road, Beaver County, PA, Pennsylvania Department of Transportation, District 11-0. Geotechnical Project Designer responsible for geologic support for the geotechnical design of a CON/SPAN culvert measuring approximately ten meters in length for the replacement of a deteriorated single-span bridge. The project involved subsurface investigation, laboratory testing, bearing capacity and settlement evaluation, footing elevation determination, approach slope configuration, geotechnical engineering report, and all required geotechnical special provisions and details.

September 2011: Ohiopyle State Park, Fayette County, PA, Pennsylvania Department of Conservation and Natural Resources. Geotechnical Project Designer responsible for site reconnaissance, subsurface investigation, and sampling phase of a geotechnical investigation of failing embankments constructed for a passive acid mine drainage treatment system. Determine the boring sequence which would yield the maximum subsurface information for the allotted budget while in the field. Oversaw sub-contracted drill crew. Selected sampling intervals for 13 undisturbed samples. Prepared geotechnical cross sections and profiles in the field. Prepared summary of field activities and conditions for insertion into report.

November 2011 to Present: #1 Cochran Automotive Development, Allegheny County, PA. Trans Associates, Inc. Geotechnical Project Designer responsible for site reconnaissance, preparation of Phase I Geotechnical

EXAMPLE LRS APPLICATION

Engineering Report, Highway Occupancy Permit, development of subsurface boring program, geotechnical testing program, Final Design Geotechnical Engineering Report, and all required geotechnical special provisions and details.

May 2012 to Present: In Situ Reductive Dechlorination of Chlorinated Solvents at a Rail Car Repair Facility, Keyser, WV, Confidential Client. Project Manager responsible for the remediation of trichloroethylene (TCE), a common industrial degreasing solvent, in the soil and groundwater at a rail car repair shop. The site contained a 900-foot-long TCE groundwater plume that extended from the shop toward an adjacent river. The source area soil was excavated and disposed of offsite. Prepared remedial action plans specifying in situ-enhanced reductive dechlorination and monitored attenuation, which were approved by the state regulatory agency. The reductive dechlorination system relies on anaerobic biodegradation of the chlorinated organic compounds. Reducing conditions in the saturated zone are maintained by injecting a cometabolic substrate below the water table. The substrate, consisting of food-grade sugars, provides a carbon source that is fermented and releases hydrogen. The hydrogen provides the necessary electrons to drive the reductive dechlorination. The remedial process is designed to convert the chlorinated solvents to non-toxic compounds, including chloride, ethylene, and water.

May 2012 to Present: In Situ Reductive Dechlorination of Chlorinated Solvents at a Rail Car Repair Facility, Grafton, WV, Confidential Client. Project Manager responsible for the remediation of trichloroethylene (TCE), a common industrial degreasing solvent, in the soil and groundwater at a former rail car repair shop. The site monitoring wells indicated a TCE groundwater plume that extended from the shop toward an adjacent river. Prepared remedial action plans specifying in situ-enhanced reductive dechlorination and monitored attenuation, which were approved by the state regulatory agency. The reductive dechlorination system relies on anaerobic biodegradation of the chlorinated organic compounds. Reducing conditions in the saturated zone are maintained by injecting a cometabolic substrate below the water table. The substrate, consisting of food-grade sugars, provides a carbon source that is fermented and releases hydrogen. The hydrogen provides the necessary electrons to drive the reductive dechlorination. The remedial process is designed to convert the chlorinated solvents to non-toxic compounds, including chloride, ethylene, and water.

May 2012 to Present: In Situ Enhanced Aerobic Biodegradation of Petroleum Hydrocarbons at a Rail Car Repair Facility, Ridgeley, WV, Confidential Client. Project Manager responsible for the remediation of elevated TPH-DRO constituents in the soil at a former locomotive fueling facility and aboveground diesel storage tank. A soil treatability study was conducted to evaluate the use of bioaccelerants to reduce contaminant concentrations in the soil. Performed final design of a subsurface delivery system for injection of an oxidative slurry. The slurry provides a slow release of oxygen to the vadose zone, thereby enhancing the supply of electron acceptors available for mineralization of the petroleum hydrocarbons by indigenous microbes. Also provided construction oversight and field testing of various slurry mixes to optimize slurry distribution.

May 2012 to Present: Rail Yard Remediation, Keyser, WV, Confidential Client. Project Manager responsible for a remedial investigation, which was followed by free product recovery and groundwater natural attenuation monitoring. Contaminants in the groundwater included petroleum hydrocarbons and chlorinated solvents. The monitoring scope was progressively reduced in step with observed attenuation and state regulatory agency approval.

May 2012 to Present: Rail Yard UST Investigation, Grafton, WV, Confidential Client. Project Manager responsible for a remedial investigation, which concluded with a recommendation of no further action to the state regulatory agency. Currently awaiting comments.

May 2012 to Present: Rail Yard Remediation, Grafton, WV, Confidential Client. Project Manager responsible for a program of free product recovery and groundwater natural attenuation monitoring. Contaminants in the groundwater included petroleum hydrocarbons and chlorinated solvents. A soil treatability study was conducted to evaluate the use of bioaccelerants to reduce contaminant concentrations in the soil. The conceptual remedial plan specifies the use of below-grade lateral piping to facilitate bioaccelerant delivery and eliminate the disruptions to rail traffic that would occur if a traditional soil remedy were applied.

May 2012 to Present: Rail Yard Remediation, Ridgely, WV, Confidential Client. Project Manager responsible for a groundwater natural attenuation monitoring program and the remediation of soil at a former locomotive

fueling area and above-ground diesel fuel storage tank. Tasks include collecting groundwater data, recovering free product, and demonstrating ongoing natural attenuation of contaminants in groundwater. The monitoring scope was progressively reduced in step with observed attenuation and state regulatory approval.

May 2012 to Present: Bioventing to Reduce Petroleum Concentrations in Soil, Rowlesburg, WV, Confidential Client. Project Manager responsible for designing, constructing, and optimizing a bioventing system to remediate petroleum hydrocarbons in subsurface soil. Effectiveness studies showed a 60-percent reduction in contaminant concentrations after two years of operation. Currently coordinating monthly operation and maintenance visits to the site, and performing bi-annual system performance evaluations.

Professional References			
Reference 1			
NAME **Rachel Carson**	COMPANY **Silent Springs Company**		
TITLE **President**	EMAIL **rachelcarson@silentsprings.org**	PHONE **333-333-3333**	
ADDRESS **613 Marion Ave**	CITY **Pittsburgh**	STATE **PA**	ZIP **15144**
Reference 2			
NAME **Nickola Tesla**	COMPANY **Graz University of Technology**		
TITLE **Electrical Engineer**	EMAIL **teslaeclectricco@graz.edu**	PHONE **444-444-4444**	
ADDRESS **12 Rechbauer Street**	CITY **Graz**	STATE **NY**	ZIP **10038**
Reference 3			
NAME **Albert Einstein**	COMPANY **Newtonian Mechanics Company**		
TITLE **Theoretical Physicist**	EMAIL **Emc2einstein@relativity.com**	PHONE **555-555-5555**	
ADDRESS **21 Wurttemberg Ave**	CITY **Princeton**	STATE **NJ**	ZIP **07001**

APPENDIX C: SAMPLE LRS EXAMINATION QUESTIONS

Questions:

1. The acceptable toxicity level for the combined toxic effects of noncarcinogens is a Hazard Index of _____.
    a. 1
    b. 1 or less
    c. 1 or above
    d. less than 1

2. Once it is determined following the site assessment that remediation of a site is necessary, remediation standards are to be selected to provide adequate protection of human health and the environment relative to current and reasonably anticipated future use.
    a. True
    b. False

3. A potentiometric surface map is used to evaluate:
    a. Hydraulic conductivity
    b. Porosity
    c. Sustainable yield
    d. Direction of groundwater flow

4. A Licensed Remediation Specialist (LRS) may perform:
    a. All site remediation activities
    b. Only engineering services
    c. Only those tasks for which the LRS has specific training and experience
    d. No specific tasks; the LRS only supervisees others performing tasks

SAMPLE LRS EXAMINATION QUESTIONS

Answers:

1. b
2. a
3. d
4. c

APPENDIX D: LRS LICENSE RENEWAL FORM

Licensed Remediation Specialist Program

West Virginia Department of Environmental Protection
Office of Environmental Remediation

License Renewal Form

Continuing Education Requirements

Licensed Remediation Specialists must complete and submit evidence of continuing education to be eligible for license renewal. Professional development hours may be earned by attending and successfully completing college courses, continuing education courses, seminars, workshops, and conferences pertaining to investigation, assessment, or remediation of hazardous substances and petroleum. Twelve professional development hours are required every two years. Additional information, including a full list of appropriate topics, may be found in the LRS Program Guide.

Instructions for Completion and Submission

Document all continuing education to the nearest quarter hour. Submit the completed and signed form, with attached supplemental documentation (certificate, course description, training agenda, conference program, etc.) via email to DEPLRSProgram@wv.gov.

Section 1 – LRS Contact Information

LRS Number	License Expiration Date	LRS Name	Company	Email

Address	City	State	Zip Code	Office Phone	Cell Phone

Section 2 – Proof of Continuing Education

	Course Title	Sponsoring Organization and/or Instructor	Date(s) Attended	Hours Attended	Location (City/State)
1.					
2.					
3.					
4.					
5.					
6.					
7.					
8.					

Section 3 – Statement of Affirmation

I hereby certify that I attended the above listed continuing education courses to be given credit as LRS professional development hours and be eligible for license renewal.

LRS Signature _____ Date _____

Section 4 – Submission Review (for WVDEP use only)

Date	Reviewer	Determination	Comments
		☐ Approved ☐ Rejected ☐ More Information Needed	