# Exhibit A

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#### **ENVIRONMENTAL DESIGN ENGINEERING**

# **BRUCE N. NELSON**

Bruce Nelson has more than 30 years of applied hydrology and engineering experience within the mining industry working for private mining operations. This experience spans work responsibility from technician level to project management, providing broad insight into all aspects of hydrology and environmental engineering as it applies to mining. As a Compliance Engineer, Mr. Nelson gained knowledge and experience with environmental regulations, and has conducted numerous compliance audits, submitted numerous reports and permit applications to regulatory authorities, and is experienced in permit negotiations, and hearings.

# Education

M.S., Civil Engineering, Montana State University (1980)

B.S., Fish and Wildlife Management, Montana State University (1976)

# Experience

Present	Sr. Engineer/Hydrologist and Principal Environmental Design Engineering, Sheridan, WY
1985-1993	Sr. Corporate Hydrologist Nerco Coal Corp., Sheridan, WY
1982-1985	Hydrologist/Environmental Compliance Engineer NERCO Mining Company, Sheridan, WY
1980-1982	Environmental Engineer Pueblo Regional Planning Commission, Pueblo, CO
1979-1980	Air Quality/Meteorology Consultant Montana Air Quality Bureau, Anaconda, MT

# **Professional Registrations**

Licensed Professional Engineer:	Wyoming (No. 4865) Montana (No. ENG08663E) NCEE (No. 11710) South Dakota (No. 5780) Alaska (No. 9205) Idaho (No. 8373)

Licensed Monitor Well Constructor No. MWC-050

# Affiliations

American Society for Surface Mining and Reclamation Association of Groundwater Scientists and Engineers American Water Well Association Rocky Mountain Water Pollution Control Association Water Pollution Control Federation Environmental Engineering Honor Society Civil Engineering Honor Society

# **Representative Projects / Primary Client List**

- Anadarko Petroleum Corporation
- Antelope Coal Company
- Arch of Wyoming
- Associates Mining Company
- Bridger Coal Company
- Brohm Mining Co., Gilt Edge Mine
- Campbell County Conservation District Watershed Study
- City of Sheridan, WY City of Sheridan, WY
- Clay City Mine
- Coeur Mining, Kensington Mine Inc.
- Glenrock Coal Company
- Hecla Mining Company, Grouse Creek Mine Yellowpine Project
- High Plains Uranium, Inc.
- Homestake's Corona Gold Inc.
- Homestake's Grants Reclamation Project
- Kennecott Greens Creek Mining Company
- Kinross-Delamar Mining Company
- Mineral Hill Mine
- NERCO Minerals
- NERCO Mining Company

# **EDE CONSULTANTS**

- PV Mining Company
- Pend Orielle Mine
- Powder River Conservation District Watershed Study
- Power Resources Highlands Uranium Project
- Rhone-Poulenc Wyoming
- Rio-Tinto Minerals (US Borax, Boron Operations)
- Sequatchie Valley Coal Company
- Sheridan Area Water Supply Joint Powers Board
- Spring Creek Coal Company
- Stibnite Mining Inc.
- Sweetwater County Conservation District Watershed Study
- Teck Cominco Pogo Project
- Town Of Dayton, WY
- Town Of Ranchester, WY
- Triton Coal Company, Buckskin Mine
- Vandalia Mining Company
- Wyoming Highway Department
- Wyoming Sawmills Inc.
- Wyoming Water Development Commission

# **PROJECTS**:

The listing provided below is a representative listing of projects reflecting the range and scope of project involvement. A full listing of all project involvement is available upon request.

# Antelope Coal Company, Wyoming

2006-2007 Management of Environmental Impact Study (EIS). Primary contractor managing the team assembled by Antelope Coal Company and the BLM to conduct the necessary studies, compose supporting technical reports, and prepare the EIS.

1984-1998 Provided Hydrology support to include:

- Groundwater and surface water monitoring data acquisition and management
- DEQ –LQD Annual Report Hydrology section
- Mine wide sediment control plan and designs
- Upslope flood control plan including detailed diversion, impoundment, and channel re-alignment
- Pit dewatering design and implementation
- Baseline hydrologic investigations, including Alluvial Valley Floor characterization, and comprehensive reporting
- Surface water monitoring station installation

- Groundwater modeling
- Runoff and flood modeling
- Water treatment

# Bridger Coal Company, Wyoming

1999-Present Provided Hydrology support to include:

- Groundwater and surface water monitoring data acquisition and management.
- DEQ –LQD Annual Report Hydrology section.
- Mine wide sediment control plan and designs.
- Baseline hydrologic investigations.
- Surface water monitoring station installation.
- Runoff and flood modeling.
- Flood alarm system modeling, design and installation.
- Wetlands mitigation / restoration.
- Surface and groundwater permit updates.

# Brohm Mining Corporation, South Dakota

- 1994 Project leader in the development of an acid rock drainage treatment plant. Assessed treatment conditions, and defined design parameters. Contacted potential equipment suppliers to implement the construction of a conventional neutralization, precipitation, flocculation, settling, thickening and discharge treatment system.
- 1994 Provided designs and specification for 2 seepage collection ponds, pump stations, and pipeline systems. These ponds were fully lined under-drained facilities for the collection of mine affected water.
- 1994 Conducted a flood evaluation of a severe flood, which occurred at the mine. The study determined the flood magnitude and recurrence interval.

# **Conservation Districts**

- 2003–Present Powder River Conservation District Watershed Study, Kaycee, WY. Conducted water quality monitoring to determine cause of chloride exceedence in the Salt Creek Watershed and selenium exceedence on the Powder River.
- 2002–Present Sweetwater County Conservation District Watershed Study, Farson, WY. Conducted water quality monitoring to determine cause of elevated fecal coliform and chlorides in Bitter and Killpecker Creeks. Also to determine if reclassification of both creeks was necessary.

- 2004 Campbell County Conservation District, Gillette, WY. Conducted historical review and water quality data and analysis for the Belle Fourche, Little Powder River, and Powder River Watersheds. Study was to show impairment of Donkey Creek, Stonepile Creek and Little Powder River as well as potential influences from coal bed natural gas co-produced water to the Lower Powder River Watershed and Little Powder River Watershed
- 2003 Lake DeSmet Conservation District Shell Creek Watershed Study, Buffalo, WY. Conducted comprehensive study of land owners irrigation water flow and quality into the Shell Creek Watershed.

## Glenrock Coal Company, Wyoming

1995–Present Provided Hydrology support to include:

- Groundwater and surface water monitoring data acquisition and management
- DEQ –LQD Annual Report Hydrology section
- Surface water monitoring station installation
- Runoff and flood modeling
- Surface and groundwater permit updates
- Well location and installation
- Permit conversion from paper to electronic format
- Aquifer testing

#### Hecla Mining Company, Idaho

- 2006–2007 Provided alternatives for runoff conveyance measures to control runoff within mine reclamation for the 500 yr 24 hr design event. Provide detailed design details, drawings, and specifications for the preferred alternative. Prepare comprehensive construction QA/QC plan and provide construction administration. Prepare as-built drawings and report at project completion. Ongoing.
  - 2004 Upgrade to Zero Valent from infiltration gallery to increase treatment system capacity. Performed system design and installation construction administration.
  - 2004 Conducted three dimensional groundwater flow model update for infiltration gallery and a contaminant dispersion model to determine the effects of treated water discharge on an alluvial aquifer.
  - 2003 Zero Valent Iron Treatment System- Installed upgrade to Zero Valent Iron tailings seepage treatment system for removal of elevated arsenic levels and installation of associated infiltration gallery for system discharge to groundwater. Involved design of system appropriate to

existing flow rates as well as construction administration of system installation.

- 2001 Conducted three dimensional groundwater flow model for infiltration gallery and a contaminant dispersion model to determine the effects of treated water discharge on an alluvial aquifer. Review and approved by the State of Idaho.
- 2001 Design and specification of industrial wastewater treatment system to remove arsenic and cyanide.

# High Plains Uranium, Inc., Wyoming

2006-2007 Conducted hydrologic baseline studies for Wyoming State Permit to Mine and Nuclear Regulatory Commission Source and Byproduct Material License applications for the Allemand Ross Project in situ leach uranium mining operation. Scope of work included characterization of the regional and local ground water systems and surface hydrology through three dimensional modeling of geology and groundwater hydrology, groundwater and surface water quality monitoring, assessment of hydrologic characteristics of aquifers, assessment of erosion and flooding potential, and compilation of water rights and abandoned drill hole information.

#### Homestake Mining Co., New Mexico

- 1997–1998 Conducted pilot scale biological treatment system for removal of selenium from various water sources. Treatment technology and the pilot system proved to be effective in meeting the company objectives.
- 1997-1998 Conducted extensive column tests to assess the feasibility of in-situ treatment of water for the removal of selenium, uranium, and molybdenum. Studies ongoing.

#### Kennecott Greens Creek Mining Company, Alaska

- 2007 Modeled runoff for a tailings placement area for existing and future conditions and provided design specifications for conveyance ditches, surge pond, and discharge pipeline.
- 2006–Present Conducted underground closure planning and hydrologic studies, including 3D GIS database development, underground borehole hydraulics testing, and in-situ water-quality reclamation design.
- 2006–Present Assisted with design and specification of a 2,400 gpm water treatment plant. The treatment facilities were designed to remove metal contaminants from tailings disposal and meet peak discharge

requirements during design storm runoff events within mine disturbance. Work included bench testing various metals precipitant alternatives.

- 1996–Present Conducted tailings disposal area hydrologic study, including aquifer testing, groundwater modeling, infiltration testing, and materials testing for water and contaminant transport. Report submitted to EPA and USFS for review and approval. Updates to tailings disposal area hydrologic study reports, included monitor well installation oversight, aquifer testing, hydro geologic framework modeling, and extensive data compilation and interpretation.
  - 2004-2006 Water Treatment Plant Review. Reviewed effectiveness and useful life of existing tailings water treatment system and evaluated replacement treatment systems and technologies. Involved reviewing potential new system locations and calculating/designing potential pipeline routing and capacities.
    - 2001 Prime Contractor in writing hydrologic and geochemistry baseline documents for an environmental impact statement for a mine tailings pile expansion.
  - 1995-1996 Assisted with design and specification of 2-800 gpm water treatment plants at the mine site. The treatment facilities were designed to remove metal contaminants from a tailings disposal site and from the ore processing mill. The work included conducting treatment studies, permitting the facilities, obtaining the NPDES permits, providing engineering designs, drawings, and specifications. The treatment plants are operational and meeting all applicable standards.

# Kennsington Mining Co., Alaska

1997-1998 Conducted bench scale water treatment studies to determine a treatment process effective in meeting NPDES standards. Continued work to complete the second phase in assisting in design and construction of a 400 gpm treatment plant at the mine site.

# Kinross-Delamar Mine Inc., Idaho

1996 Conducted bench scale water treatment studies for defining design and operational parameters for a 500 gpm water treatment plant for a 200 acre-ft. tailings impoundment. The work involved running multiple series of water treatment tests for the removal of metals and nonmetals to stringent compliance levels as dictated by the mine NPDES permit.

# **EDE CONSULTANTS**

# <u>Mineral Hill Mine, Montana</u>

- 1997-Present Provided Engineering support to include:
  - Groundwater remediation
  - Lysimeter location and installation
  - Design and installation of biological water treatment system for removal of thiocyanate
  - Soil moisture probe acquisition and installation
  - Groundwater sampling

## Power Resources Highlands Uranium, Wyoming

- 2004 Conducted well locating, pipe and pump removal and abandonment of groundwater wells in accordance with DEQ regulations and methods for 103 wells. Involved filling and plugging boreholes, removing surface stickups, and re-vegetating well head locations.
- 1994 Conducted groundwater flow and solute transport modeling to determine post closure-post reclamation water quality, quantity and flow direction as well as estimate time to final equilibrium conditions. Detailed technical report written and submitted to the mine.

#### Rhone-Poulenc Trona, Wyoming

1995 Supervised environmental monitoring well drilling for the Rhone-Poulenc Trona operation in Wyoming. Conducted water quality sampling and testing, aquifer testing and assembled a hydrologic characterization report for submittal to the WY - DEQ.

#### Sequatchie Valley Coal, Tennessee

- 1991-1993 Evaluation of hydrologic conditions surrounding surface and groundwater quality problems, during and post mining. This project involved designing and installing surface monitoring sites for 6 perennial streams encompassing over 20 monitoring sites. Several sites were equipped with non water contact ultrasonic transducers and data loggers. In addition a comprehensive bedrock groundwater and spoils groundwater-monitoring plan was developed, approved by OSM and implemented. Implementation involved drilling, testing and monitoring of over 25 wells. Finally, a remediation plan was developed and a series of 11 dewatering wells were constructed and placed into service.
  - 1992 Primary investigator in evaluation of potential shallow alluvial groundwater contamination problem at a coal tipple facility and rail siding. Designed and implemented a groundwater monitoring plan, collected samples and compiled a comprehensive report to OSM and

TNDEC regarding the hydrologic and water quality conditions at the site.

1991 Rewrote the probable hydrologic consequences assessment for 2 mine permit areas and submitted to OSM. Conducted comprehensive statistical evaluation of surface and groundwater quality data for comparison against baseline monitored conditions.

# Spring Creek Coal Company, Montana

1987-1995 Provided Hydrology support to include:

- Impoundment inspections and certifications
- Annual hydrology report
- Runoff and flood modeling
- Writing storm water Pollution Prevention Plan
- Groundwater and surface water monitoring
- Upslope runoff control pond design
- AVF restoration planning
- Permit updates
- Water supply system design
- Pit dewatering plan

# Stibnite Mine Inc., Idaho

- 1996 Designed a water bypass system to route native water from Meadow Creek around a spent ore tailing pile. The project was conducted under an EPA CERCLA action for the remediation of water quality impacts to the Salmon River.
- 1996 Conducted water treatment studies for the removal of elevated levels of arsenic from seepage water from a tailings disposal area. The study involved evaluating feasible treatment technologies to assure compliance with an EPA Order on Consent associated with a CERCLA action at the site.
- 1997 Conducted aquifer tests on a series of wells associated with tailings and spent ore disposal. Compiled new and existing data into a hydrologic characterization report of the site.

# U.S. Borax, California

2007 Constructed review of statistical analysis methodology used to detect variation in groundwater quality. Required reviewing historic WQ data for 30 GW monitoring wells and identifying actual trends arising form outlying data and detention limit reporting methods. Provided recommendation for statistical method to be used in for ongoing analysis of the monitoring data.

- 2004–2006 Surface water runoff modeling. Evaluate surface water runoff control for the entire mine. Includes modeling surface runoff water and sediment volumes for various storm events as well as design and location of surface water catchments for the 100yr-24hr event. Includes runoff control over native, disturbed, and facilities areas.
- 2003–Present Plume containment- Made recommendations for plume containment and recovery of a groundwater contamination plume. Required aquifer restoration planning and determination of plume extent. Involved installation of groundwater monitoring wells and evaluation of groundwater quality both via sampling and insitu within the well bore, hydrogeologic framework modeling, and hydrologic and geochemical data analysis and interpretation.
  - 1999–2001 Principal consultant on large scale mine dewatering project for open pit mine. Involved drilling over 200 monitoring piezometers and 60 pumping wells in addition to the design of all necessary water management appurtenances such as pipelines and storage, use, and disposal facilities.
    - 1998 Conducted extensive groundwater hydrologic investigations including well construction, aquifer testing, and groundwater flow modeling. Used hydrologic studies results to construct a groundwater flow model of the site and design a de-watering system to enhance pit wall stability.

# Vandalia Mining Co, West Virginia

1992 Assisted with evaluation of monitoring needs with regard to continuous monitoring of groundwater levels. Provided equipment to allow for installation of chart recorded continuous monitoring.

# Warren Developments, Wyoming

1994 Designed a sewage lift station for a small industrial park to provide for sewage comminution and pumping to the city sewage system. The project involved a site survey, utilities mapping, pipeline design, sump and pump sizing and specifications to local and state building codes.

# Wyoming Sawmills, Wyoming

1994 Conducted field evaluation, designed and specified a wastewater treatment system for a 100+ employee sawmill. The existing system

had failed and the configuration of the existing system was unknown. Provided complete designs for regulatory permitting, and provided construction details, drawings and specifications.

1994 Designed sewage lift station and piping system to pump sewage from 3 separate sites to a single collection location. Project involved a site survey, utilities mapping, pipeline design, sump and pump sizing and specification to local and state building codes.

## Wyoming Water Development Commission, Wyoming

- 2000 Completed level 1 study of the water treatment plant intake and treatment system for the municipal water supply of Dayton, Wyoming.
- 2001 Completed preliminary design for water treatment plant upgrades for the municipal water supply of Dayton, Wyoming.
- 2002 Ranchester Water Supply Project. Level 1 Study for the Wyoming Water Development Commission. The treatment plant was evaluated for system performance, efficiency, and ability to meet applicable and future water quality standards. Recommendations sent to the WWDC.
- 2001-2002 Conducted work on compiling information regarding coal bed methane development in the drainages of Deadhorse Creek, Wild Horse Creek and Spotted Horse Creek, Wyoming.

# Wyoming Department of Transportation (WYDOT)

1995 Developed a pollution control and prevention plan as a subcontractor to the Wyoming Department of Transportation (Highway Department

In addition to the above specific projects EDE has direct involvement with many SMCRA Permit to mine applications, annual technical reports to regulatory agencies, and confidential technical reports.