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# VIKTOR RAYKIN, CGWP

## PROFESSIONAL HISTORY

- 1996 - present: AATA International, Inc., Woodmere, New York
- 1989-1996: Eder Associates, Inc. Environmental Scientists and Engineers, Locust Valley, New York
- 1982-1988: National Ministry of Geology and Subsurface Protection, Engineering and Design Center, Moscow, USSR
- 1986-1988: National Academy of Sciences, Geological Abstract Journal, Moscow, USSR (freelance)
- 1983-1988: National Ministry of Geology and Subsurface Protection, Abstract Journal, Moscow, USSR (freelance)
- 1980-1981: Underground Tunneling & Construction Company, Moscow, USSR

## EDUCATION

- Master of Science in Earth Sciences  
Institute of Geological Exploration, Moscow, USSR
- Bachelor of Science in Geology and Mining Engineering  
Institute of Geological Exploration, Moscow, USSR

## MEMBERSHIP AND AFFILIATIONS

- International Association for Impact Assessment
- The Environmental, Health & Safety Auditing Roundtable
- Association of Ground Water Scientists and Engineers, Division of National Ground Water Association

## CERTIFICATIONS

- Certified Ground Water Professional #514 (CGWP) since 1995

## SPECIAL TRAINING

- Certified 40-hour OSHA Health and Safety Course
- Certified 8-hour OSHA Supervisory Course
- Environmental Database Management System, Training Course, GIS Solutions, Inc.
- Immunoassay Analytical Field Methods Certification Training, EnSys, Inc.

- Maximizing the Effectiveness of an Environmental Investigation, Training Course, Eder Associates, Inc.
- Portable Gas Chromatography Training Courses, Eastern Connecticut State University and Photovac International, Inc.

## MANAGEMENT AND TECHNICAL SPECIALTIES

*Vice-President/Chief Hydrogeologist* — Manager of domestic and international environmental and occupational health and safety due diligence assessments, environmental impact statements, technical environmental baseline studies, environmental monitoring programs, and comprehensive environmental management programs. Coordination and management of environmental permitting process for large-scale natural resource development projects. Hydrogeologic monitoring, modeling, and analysis are primary technical specialties. Developed project strategies and prepared proposals, work plans, and budgets for large-scale environmental site investigations and geological exploration programs. Developed and implemented GIS-based environmental database management system with 3-D simulations of complex subsurface conditions. Applied groundwater modeling to evaluate water supply and remedial alternatives using a variety of numerical and analytical models. Directed non-intrusive geophysical techniques and portable gas chromatograph analyses as part of environmental site investigations. Provided technical expertise for litigation support related to environmental protection and underground mining. Developed and presented seminars for regulatory agencies, environmental managers, and environmental attorneys.

## LANGUAGES

- Russian (native)
- English (fluent)
- Ukrainian (working knowledge)
- German (technical translation)

## COUNTRIES OF EXPERIENCE

### *Domestic (USA):*

<i>1. Florida</i>	<i>10. New York</i>
<i>2. Georgia</i>	<i>11. New Mexico</i>
<i>3. Illinois</i>	<i>12. Ohio</i>
<i>4. Kansas</i>	<i>13. Pennsylvania</i>
<i>5. Maryland</i>	<i>14. Texas</i>
<i>6. Michigan</i>	<i>15. Vermont</i>
<i>7. Nebraska</i>	<i>16. Wisconsin</i>
<i>8. Nevada</i>	<i>17. Wyoming</i>

9. <i>New Jersey</i>	
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***International:***

1. <i>Armenia</i>	10. <i>Kazakhstan</i>
2. <i>Australia</i>	11. <i>Kyrgyzstan</i>
3. <i>Azerbaijan</i>	12. <i>Moldova</i>
4. <i>Bolivia</i>	13. <i>Mongolia</i>
5. <i>Brazil</i>	14. <i>Republic of Congo</i>
6. <i>Canada</i>	15. <i>Russia</i>
7. <i>Georgia</i>	16. <i>Ukraine</i>
8. <i>Indonesia*</i>	17. <i>United Kingdom</i>
9. <i>Israel</i>	18. <i>Venezuela</i>

*Note: \* the work was performed from the home base*

**SELECTED CLIENTS**

- Anadarko Petroleum Corporation, Houston, TX
- Avalon International, L.C., Tulsa, Oklahoma
- Bakyrchik Gold P.L.C., London, United Kingdom
- Barrick Goldstrike Mines, Inc., Elko, Nevada
- Bateman Engineering, Inc., Denver, Colorado
- BHP Minerals, London, United Kingdom
- BP, Sunbury, United Kingdom; Yuzhno-Sakhalinsk, Sakhalin Island, Russia
- Brookhaven National Laboratory, Upton, New York
- Bullivant Houser Bailey Pendergrass & Hoffman, Portland, Oregon
- Cameco Corporation, Saskatoon, Saskatchewan
- ChevronTexaco, San Ramon, California
- Chevron Business Development, Inc., London, United Kingdom
- Costilla Energy, Midland, Texas
- CSX Transportation, Inc., Jacksonville, Florida
- De Beers, multiple office locations
- Deno Gold Mining Company, Kapan, Republic of Armenia
- Dundee Precious Metals, Inc., Toronto, Canada; Sofia, Bulgaria
- Duracell, Tarrytown, New York
- Echo Bay Mines, Englewood, Colorado
- Ennex International plc, Dublin, Ireland
- European Bank of Reconstruction and Development (EBRD), London, United Kingdom
- ExxonMobil, Houston, Texas
- Exxon Neftegas Ltd., Yuzhno-Sakhalinsk, Russia
- Fairchild Industries, Inc., Farmingdale, New York
- Frontier Mining Ltd, Denver, Colorado

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- Gold Reserve, Inc., Spokane, Washington
  - International Paper, Ticonderoga, New York
  - Israel Electric Corporation Ltd., Haifa, Israel
  - Jacobs Engineering Group, Inc., Denver, Colorado
  - KazMinCo, Surrey, United Kingdom
  - Kvaerner Metals, Toronto, Canada
  - Lenox China, Pomona, New Jersey
  - Lundin Mining, Stockholm, Sweden
  - Marathon Oil Company, Houston, Texas
  - Minproc Engineers Limited, Perth, Australia
  - Murphy Oil USA, Inc., Superior, Wisconsin
  - National Presto, Eau Claire, Wisconsin
  - Newmont Gold Company, Denver, Colorado
  - Nicoletti Kissel & Pesce, New York, New York
  - North American Salt Company, Hutchinson and Lyons, Kansas
  - Ogden Aviation Service Company (LaGuardia Airport, NY, and Newark Airport, NJ)
  - Overseas Private Investment Corporation (OPIC), Washington, DC
  - OXY-USA
  - Penntech Papers, Inc., Johnsonburg, Pennsylvania
  - Pepsi-Cola, Long Island City, New York
  - Putney Paper Company, Putney, Vermont
  - Redeco Limited, L.L.C., Oklahoma City, Oklahoma
  - Rio Tinto, Bristol & London, United Kingdom; Melbourne, Australia
  - Royal Haskoning, Nijmegen, The Netherlands
  - Sakhalin Energy Investment Company, Ltd., Rijswijk, The Netherlands/Moscow, Russia
  - Shell Exploration & Production Services B.V., The Netherlands
  - Vulcan Chemicals Company, Wichita, Kansas
  - Western Pinnacle Mining Ltd., Moscow, Russia
  - Whiteman Osterman & Hanna, Albany, New York
  - World Bank, Washington, DC

## **REPRESENTATIVE PROJECT EXPERIENCE**

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## Oil & Gas Projects

*Azerbaijan Early Oil Project, European Bank for Reconstruction and Development (EBRD) and the World Bank. Owners, BP Amoco, Exxon, and participants in AIOC Project, Azerbaijan and Georgia*

Senior EHS Auditor. AATA served as the environmental, health, and safety auditing consulting company for EBRD and World Bank (the Initial and Completion Audits).

Performed initial environmental review and completion audit for USD\$14B oil project, which included Chirag offshore platform, undersea pipelines, Sangachal and Supsa terminals, and two major oil pipelines (northern and western routes). Inspected all major facilities and prepared summary completion report according to EBRD requirements. Provided Completion certificate for compliance with all local, national, and international environmental requirements and standard industry practices.

*Cuiabá Gas Pipeline Project, Overseas Private Investment Corporation (OPIC), owners ENRON, Shell, Transredes, Brazil and Bolivia*

Senior Hydrogeologist. AATA served as the on-site environmental, health, and safety inspection company overseeing the construction of 640-km gas pipeline from Bolivia to Brazil in various sensitive ecosystems. Evaluated and identified potential impacts from the pipeline construction activities in the karst terrain that contained numerous caverns, sinkholes, and wildlife habitats. Made a critical review of the directional drilling operations through mountainous terrain.

*Israel Electric Corporation Gas Pipeline Project, Israel*

Project Manager. AATA currently serves as environmental management consultant for the Israel Natural Gas Transmission System Project, managed by the Israel Electric Corporation Ltd. (IEC). AATA performed an Environmental Impact Assessment to address the political risk insurance requirements of the Overseas Private Investment Corporation (OPIC). The EIA was developed by AATA in association with Finkel & Finkel Consulting Engineers Ltd. from Israel. AATA provided program management, technical evaluation and impact analysis, remote sensing, QA/QC, and other technical support. The project was completed successfully in 8 months from start to finish, including 60-days public review period, preparation of the EMMP, and OPIC Board approval of the US\$250 MM political risk insurance for the project.

*Murphy Oil (refinery), Wisconsin, USA*

Senior Hydrogeologist. Evaluated the potential impact from the refinery practices on the on the groundwater perched zone and the deep glacial aquifer.

*Orenburg Gazprom Eastern Gas Field Development Program, Russia*

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Project Manager. AATA performed an initial Environmental Impact Assessment for the Eastern Orenburg Field Development Program for submission to the Overseas Private Investment Corporation (OPIC) in 1999. The project was completed successfully in 7 weeks from start to finish, AATA's most rapid performance on a major EIA effort. Remote sensing analysis using LANDSAT-TM data was used to supplement field observations and measurements. The EIA was completely updated for the new owner for submission to the EBRD in 2001.

*Rexene Corporation Refinery, New Mexico, USA*

Senior Field Hydrogeologist. Directed an extensive subsurface investigation program that included test pit excavation and soil-vapor survey at highly contaminated sites, to define the nature and extent of groundwater and soil contamination.

*Sakhalin II Oil & Gas Pipeline Project, Sakhalin Island, Russian Far East*

Senior Program Manager. AATA is partnered with Royal Haskoning in the large 3-year contract to provide health, environmental, safety, and security (HSES) support to one of the world's largest oil and gas development projects on Sakhalin Island, Russian Far East. AATA is responsible for Russian and North American content for the over 600-mile-long oil and gas onshore pipeline, offshore pipeline, offshore platforms, LNG plant, pumping and compressor stations, production facilities, oil and gas terminal, and all ancillary activities.

Senior Program Manager. In 1998-1999 AATA served as the principal environmental management/coordination contractor on this project when they organized and/or managed environmental teams of experts from academic institutes and consulting firms from Sakhalin Island, Moscow, and other regions in the Russian Far East to conduct environmental baseline studies in the region, representing the top specialists in water quality, meteorology, fisheries, vegetation and wildlife, socio-economics, and archeological/cultural resources. Served as a liaison between the client and local regulatory and government agencies.

*Sakhalin IV/V - Environmental Due Diligence Review, Sakhalin Island, Russia*

Project Manager. AATA reviewed the available environmental information for two oil and gas lease areas offshore Sakhalin Island, Russia. Prepared a summary of the available information that included a baseline survey and OVOS (EIA) for a previous offshore exploration well. The task also included a comprehensive review of the Russian environmental regulations. The information needed for a Production Sharing Agreement and EIA was identified, and gaps in the existing information were identified and described along with a data acquisition program.

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*Sakhalin V - Marine Biology and Fisheries Study, Sakhalin Island, Russia*  
Project Manager. AATA prepared a desktop study report that summarized the marine mammals and fisheries information for the Sakhalin V oil and gas concession area offshore Sakhalin Island, Russia. Extensive Russian and Western data and literature for the area were collected and summarized. The report was used in part to evaluate the potential impacts of seismic operations in the area.

*Sakhalin Graving Dock Construction Project, Sakhalin Island, Russia*  
Project Manager. AATA served as the environmental permitting contractor for the Western/Russian joint venture construction company. Developed initial assessment of the baseline environmental conditions for the 3 alternative sites in a near-shore wetland area. Developed the environmental documentation required by the local regulators to initiate the permitting process for the graving dock. Achieved the local level approval to start construction at the area most suitable for the graving dock construction.

*Salt Creek CO<sub>2</sub> Enhanced Oil Recovery Project, Wyoming, USA*  
Senior Hydrogeologist. AATA served as principal environmental management and permitting consultant for fast-track EA under BLM NEPA rules. Environmental baseline investigations, laboratory analysis, impact assessment, and report production were performed and a FONSI obtained in less than 6 months. Responsible for hydrogeological studies and assessment of impacts to groundwater resources. Served as a liaison with the reserve engineers on the oil reserve modeling.

*Tengizchevroil (partners include ChevronTexaco, KazMunaiGaz, ExxonMobil), North Caspian Region, Kazakhstan*  
Contractors Manager. AATA served as principal environmental management consultant to Tengizchevroil and ChevronTexaco in preparation of the Strategic Environmental Impact Assessment, the “Technical Scheme” for the full field development, and litigation support on the pollution payments for a large onshore oil project. The projects included management of local and Western environmental specialists, on-site field surveys, literature reviews, data compilation, analysis, and assessment of environmental impacts. The Technical Scheme project was successfully permitted at the Atyrau Oblast and the Republic of Kazakhstan levels.

Kazakhstan Branch Manger. AATA and our local branch, AATA Kazakhstan, provided expert witness testimony support to TengizChevroil in the litigation involving sulfur storage at TCO facilities at the Tengiz operations. The government of Kazakhstan charged TCO with a US\$73MM lawsuit claiming all types of environmental, health, and safety damages. After a series of 5 court appearances and proceedings, the case was settled for US\$7MM, a total of US\$66M less than originally sought. The expert witness testimony included technical health, safety, and environmental analysis as well as regulatory analysis and interpretation by

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AATA Kazakhstan.

*Valeni Oil Field Development, Moldova*

Project Manger. Evaluated baseline environmental conditions in the oil reserves region located in an ecologically sensitive nature preserve area located in a flood plain of a major river. Organized a local environmental team from academic and research institutes in Moldova. Completed baseline environmental studies. Provided technology transfer and training to local specialists. Completed an EIA document.

*Victorovka and Baimaclia Gas Fields Development, Moldova*

Project Manager. Evaluated baseline environmental conditions in the gas field region. Organized a local environmental team from academic and research institutes in Moldova. Completed baseline environmental studies. Provided technology transfer and training to local specialists. Completed an EIA document. Achieved the OPIC approval for the project financing.

## **Mining and Mineral Exploration Projects**

*Alluvial Gold Mining Industry of the Russian Federation,(multiple sites), EBRD*

Project Manager/Senior EHS Auditor. AATA served as the principal environmental consulting company for the EBRD to perform comprehensive environmental, health, and safety audits and desktop studies of the alluvial gold mining industry in Russia including large-scale gold producing companies, artels, and refineries located throughout the Urals region, Siberia, Sakha Republic, and the Russian Far East. The survey also included development of the Environmental Action Plans (EAP) for each company audited, and resulted in the EBRD financing of the Russian gold mining companies which operated in accordance with sound technical and environmental standards.

*Bakyrchik Gold Project, Semipalatinsk Oblast, Kazakhstan*

Project Manager. AATA served as the environmental management and permitting contractor for the large-scale Western/Kazakhstani joint-venture gold mining and ore processing project in Kazakhstan. Organized a local environmental team using specialists from research institutes and consulting firms in Kazakhstan. Completed baseline environmental studies. Provided technology transfer and training to local specialists. Completed the environmental documentation necessary for successful permitting of the project, including the Kazakhstani Environmental Analysis Report (OVOS). Achieved Oblast- and Republic-level approval for the project.

Project Manager. Completed the comparative analysis of the Western and Kazakhstani environmental standards and regulations to assist the Ministry of Ecology and Bioresources of Kazakhstan in reforming the environmental regulations. Served as the chief environmental liaison with the leading Kazakhstani scientific and

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regulatory authorities during technical tours of underground mines in Canada, which used the state-of-the-art in paste backfill techniques, and the most advanced ore roasting facilities in Australia.

*Betpak Dala Region Military Units, BHP, Kazakhstan*

Project Manager/Senior EHS Auditor. Directed environmental, health, and safety due diligence analysis of the large license territory occupied by the top-secret Russian military units involved in large-scale anti-ballistic missile testing operations. This task included a comprehensive literature review, satellite imageries analysis, site inspection, and interviews with local experts, regulatory authorities, and military officials.

*Betze Seeps and Springs Study in the Gold Mine Area, Nevada, USA*

Project Manager/Senior Hydrogeologist. Conducted yearly field surveys and sampling as part of long-term (over 15 years) post-mining monitoring to determine the impacts from mine dewatering operations on the hydrology and vegetation at designated seeps and springs. Specific tasks included characterizing seeps and springs in the mine area, evaluating water chemistry and stream gauging data, and collecting yearly vegetation data sets at established transects.

*Big Bend Gold Mining Project, Mongolia*

Senior EIA Specialist/Hydrogeologist. AATA serves as principal environmental management consultant on large placer mining project on Tuul River, Mongolia. The scope of work included conducting comprehensive baseline environmental and socio-economic studies and developing international Social and Environmental Impact Assessment (SEIA) and detailed social and environmental management programs (SEMP) for OPIC review and approval. All project documentation was developed to follow Equator Principals, IFC Performance Standards, and best international practices. Provided technology transfer and training to local specialists.

*Brisas Gold-Copper Project, Venezuela*

Senior Hydrogeologist. AATA completed the very first large-scale gold mining ESIA under the newly adopted IFC Performance Standards, which is likely to become the new standard for international ESIA's in extractive industry projects. Responsible for hydrogeological studies and assessment of impacts to groundwater resources. Served as a liaison with the water resources engineers on various groundwater and surface water modeling to be fully incorporated in the environmental baseline studies, impact assessment, proposed mitigation, and monitoring.

*Congolese Polymetallic Project, Republic of Congo*

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Senior Program Manager. AATA serves as the environmental management contractor for the confidential mining project. Organized a local environmental team of experts from academic and research institutes, and consulting firms in the Republic of Congo. Completed comprehensive baseline environmental and socio-economic studies in the area where virtually no environmental and socio-economic studies were carried out in the past. Developed detailed social and environmental management programs to follow Equator Principals, IFC Performance Standards, and best international practices. Installed and maintained a state-of-the-art meteorological station at the project area. Conducted a detailed hydrogeologic site investigation program including well drilling and installation program and aquifer testing. Provided technology transfer and training to local specialists. Developing a comprehensive international Social and Environmental Impact Assessment (SEIA) and Social and Environmental Management and Monitoring Program (SEMP).

*Inkai Uranium In-situ Leaching Project, Southern Kazakhstan Oblast, Kazakhstan*  
Project Manager. AATA serves as the principal environmental, health, and safety management consultant and EIA (OVOS) manager for an *in-situ* uranium mining project located in southern Kazakhstan. Organized and managed field and laboratory baseline studies performed by a combined international and Kazakhstani technical team. A three-dimensional groundwater modeling study with comprehensive visualization and animation of the modeling results was conducted by GeoLink, a high-tech Russian consultancy. Radiological studies were conducted by MFG (formerly Shepherd Miller), USA consultants utilizing the state-of-the-art radiological survey instrumentation.

*Kapan Polymetallic Project, Syunik Province, Armenia*

Senior Program Manager. AATA served as the principal environmental management consultant and Armenian EIA (OVOS) manager for a polymetallic mining project located in Armenia. Organized and managed field and laboratory baseline studies and socio-economic surveys performed by a combined international and Armenian technical team. Provided technology transfer and training to local specialists. A conceptual groundwater modeling study and scoping for the next phase of work (Armenian EIA and International Social and Environmental Impact Assessment) was carried out as part of this study.

*Kuranakh Gold Project, Sakha Republic (Yakutia), Eastern Siberia, Russia*

Project Manager. AATA served as the principal environmental management and permitting contractor for the Western/Russian joint venture gold mining and heap leach project. Organized a local environmental team of experts from academic institutes and consulting firms in Siberia and other regions in the Russian Far East to conduct environmental baseline studies in the region with over 70 years of extensive gold mining/processing operations. Met with regional and Republic-level environmental agencies to develop preliminary strategies for regulatory approval and

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permitting of joint venture activities. Conducted comprehensive multi-year aquatic monitoring as part of environmental baseline studies.

*Legal Register for ISO 14001 Certification of the Environmental Management System, Rio Tinto Exploration Company (multiple sites), Russia*

Project Manager. Directed the development of the HSEC Legal Obligations Register as part of ISO 14001 certification of the Environmental Management System for the Rio Tinto Exploration (RTE) operations in the Russian Federation. As required by ISO 14001 standard, AATA identified all relevant legal and other similar requirements, which are applicable to the RTE activities at the federal and regional levels for a number of regions across the Russian Federation. Developed a comprehensive overview of the legislative and institutional framework of the Russian Federation to provide RTE a clear roadmap for implementing environmental projects in the areas of their operations. Compiled a list of applicable HSEC legislation including a brief summary of each legislative document and a comprehensive database of all relevant Russian laws and regulations.

*Naimanjal Gold Project, Karaganda Oblast, Kazakhstan*

Project Manager. AATA served as the environmental, health, and safety consultant for the Western/Kazakhstani joint venture gold mining and ore processing project. The project site is located within a major nuclear testing area (Semipalatinsk Polygon) where the Soviet military conducted the majority of its nuclear testing between 1949 and 1989. Organized a local environmental team of experts from academic institutes and consulting firms in Kazakhstan. Completed environmental assessment for a pre-feasibility study.

*National Ministry of Geology and Subsurface Protection of the USSR, Moscow —*

Team Leader. Responsible for research and forecasting changes in worldwide subsurface investigation technologies to support Soviet industrial development policy. Developed and promoted advanced drilling techniques and instrumental drilling for in-situ ground characterization. Prepared abstracts and technical documents for technical and lay audiences.

*North American Salt Company, Kansas, USA (multiple sites)*

Senior Hydrogeologist/Groundwater Modeler. Simulated regional groundwater flow and solute transport using two numerical models to support the calculated distribution of contaminants in groundwater and capture zone development; cross-validated the modeling results between models and through field data; validated the simulated capture zones against pumping test data. Supervised subsurface investigations and aquifer tests to close storage ponds and intercept the chloride plume. Analyzed large-scale step-drawdown pumping test at plant interceptor well and validated simulated capture zone against pumping test data.

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*Shaimerden Zinc-Lead Project, Kostanai Oblast, Kazakhstan*

Project Manager. AATA served as the environmental management and contracting contractor for the Western/Kazakhstani joint venture zinc-lead mining project. Organized a local environmental team of experts from academic institutes and consulting firms in Kazakhstan. Completed baseline environmental studies. Provided technology transfer and training to local specialists. Completed the environmental documentation necessary for successful permitting and financing of the project, including the Kazakhstani Environmental Analysis Report (OVOS) and the Western-style Environmental Impact Assessment (EIA). Achieved Oblast- and Republic-level approvals for the project.

*Underground Mine (confidential client), USA*

Senior Technical Expert. Directed and coordinated litigation support to client's counsel to evaluate the cause of a major mine collapse and flooding in one of the world's largest underground mines. Work included coordination of the international multi-disciplinary team of technical experts, and peer review of other consultants' documents, including geology, hydrogeology, geophysics, mining engineering, environmental impact studies, and rock mechanics. Provided oversight of computer modeling and visualization of stress distributions in rock and the 3-D computer model of the subsurface.

*Varvarinskoye Gold-Copper Project, Kostanai Oblast, Kazakhstan*

Project Manager. AATA served as the environmental management contractor for the Western/Kazakhstani joint venture gold-copper mining and ore processing project. Organized a local environmental team of experts from academic institutes and consulting firms in Kazakhstan. Completed baseline environmental studies. Provided technology transfer and training to local specialists. Completed an Environmental Impact Assessment (EIA) as part of the bankable feasibility study.

*Zaamar Gold Mining Project, Mongolia*

Senior Hydrogeologist. AATA served as principal environmental management consultant to Khan Resources on large placer mining project on Tuul River, Mongolia. The scope of work included conducting detailed field studies and developing comprehensive project documentation (EIA and EMMP) for OPIC review and approval. Responsible for hydrological and hydrogeological studies and assessment of impacts to surface water and groundwater resources. Developed mitigation measures and monitoring plan.

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## Other Projects

### *A1 Landfill, Michigan, USA*

Senior Field Hydrogeologist. Supervised air monitoring at a municipal landfill using PID, FID and CGI. Operated portable gas chromatograph to delineate vertical and horizontal distribution of chlorinated solvents off- and on-site.

### *Brookhaven National Laboratory, New York, USA*

Senior Field Hydrogeologist. Developed and directed electromagnetic and very-low-frequency (VLF) survey to define the location of buried objects and former waste pits.

### *Chemical Plant (confidential client), New York, USA*

Senior Technical Expert. Evaluated the fate and transport of solvents (aqueous and non-aqueous phase) released to the subsurface under a large facility in the early 1970s. Estimated discharge of the contaminated groundwater through the site storm and sanitary sewers.

### *CSX Transportation (freight railroad company), Florida, USA*

Project Manager. Developed and supervised the state-of-the-art remediation program for a RCRA facility (soil-vapor extraction and air sparging) to remediate petroleum product.

### *CSX Transportation (freight railroad company), Maryland, USA*

Project Manager. Directed extensive site investigation related to the significant release of petroleum hydrocarbons. Demonstrated that the groundwater contamination is contained within the railroad property and there is no threat to the adjacent national historic site.

### *CT Film (chemical plant), Georgia, USA*

Senior Field Hydrogeologist. Directed extensive soil-vapor survey and groundwater sampling program to assess the presence and migration of the VOC plume and its impact on a creek.

### *Fairchild Corporation (aircraft manufacturer), New York, USA*

Senior Hydrogeologist. Established the distribution of VOCs in groundwater and the client's contribution to a regional contamination problem in a multi-aquifer system in a highly industrialized area with many sources of groundwater contamination.

### *Getty Petroleum, New Jersey, USA*

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Senior Field Hydrogeologist. Directed magnetometer surveys to identify location of underground storage tanks at former gas station sites in areas characterized by high electric noise.

*International Paper, New York, USA*

Groundwater Modeler. Simulated the life cycle of a landfill based on the historic operating record, leachate collection data, and aquifer characteristics. Predicted the migration and travel time of a groundwater plume before its discharge into a lake. Evaluated the lake water quality and the potential impact from the plume discharge.

*Lenox China, New Jersey, USA*

Senior Hydrogeologist/Groundwater Modeler. Developed and directed multi-aquifer pumping and recharge mounding tests as a remedial simulation. Conducted continuous field analysis of groundwater using a portable gas chromatograph to ensure that discharged water satisfied state requirements. Simulated regional groundwater flow and remedial pumping scenarios to restore the multi-aquifer system.

*“Mosinzhstroy” (Leading Underground Facility Construction Agency), Moscow, USSR*

Field Team Leader. Supervised subsurface investigation activities at construction sites, including underground tunnel and underground facility constructions, building sewer and water supply lines, site dewatering systems, and cathodic protection of the underground pipelines.

*National Presto, Wisconsin, USA (Superfund site)*

Senior Hydrogeologist/Groundwater Modeler. Established the geology/hydrogeology of a several-mile-long VOC plume, generated in the 1950's and 1960's, migrating through a buried valley. Generated a plume image history and projected future plume images to show the natural attenuation of VOCs in the groundwater by trend analysis.

*Ogden Aviation, LaGuardia Airport, New York, USA*

Senior Hydrogeologist. Developed the maps of piezometric surface and petroleum product thickness at the discharge point to the ocean bay in a complex geology/fill subsurface conditions complicated by underground structures and utilities. Evaluated the alternatives to remediate petroleum product.

*Penntech Paper (paper mill), Pennsylvania, USA*

Senior Field Hydrogeologist. Developed a conceptual model of bedrock aquifer based on rock coring and data from oil wells and geophysical logs. Re-developed bedrock monitoring well network. Directed soil survey down to the bedrock to assess the presence and quality of perched water.

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*Pepsi-Cola Company, New York, USA*

Senior Field Hydrogeologist. Assessed seepage of the petroleum product to the ocean bay and developed the remedial measures, including skimming and utilizing absorbent socks and booms.

*Putney Paper, Vermont, USA*

Senior Hydrogeologist. Developed the documentation to defend the client's sludge landfilling practices. Demonstrated negligible impact from dioxin leached to the groundwater from a landfill.

*Recycling Facility, New York, USA*

Senior Field Hydrogeologist. Demonstrated that high groundwater flow velocity would not undermine the foundation for a new building. Detailed hydrogeologic investigation included the installation of multiple piezometers using a Geoprobe with supplemental slug tests along the building foundation.

*Solvent Recycler, Ohio, USA*

Senior Hydrogeologist. Developed the documentation to defend the use of a cut-off trench to intercept contaminated groundwater in lieu of pumping wells as part of a RCRA groundwater remediation plan.

*Vulcan Chemical, Kansas, USA*

Senior Hydrogeologist. Conducted multi-aquifer pumping test and supervised monitoring well installation to characterize groundwater contamination on- and off-site. Conducted electromagnetic survey to define the extent of perched water.