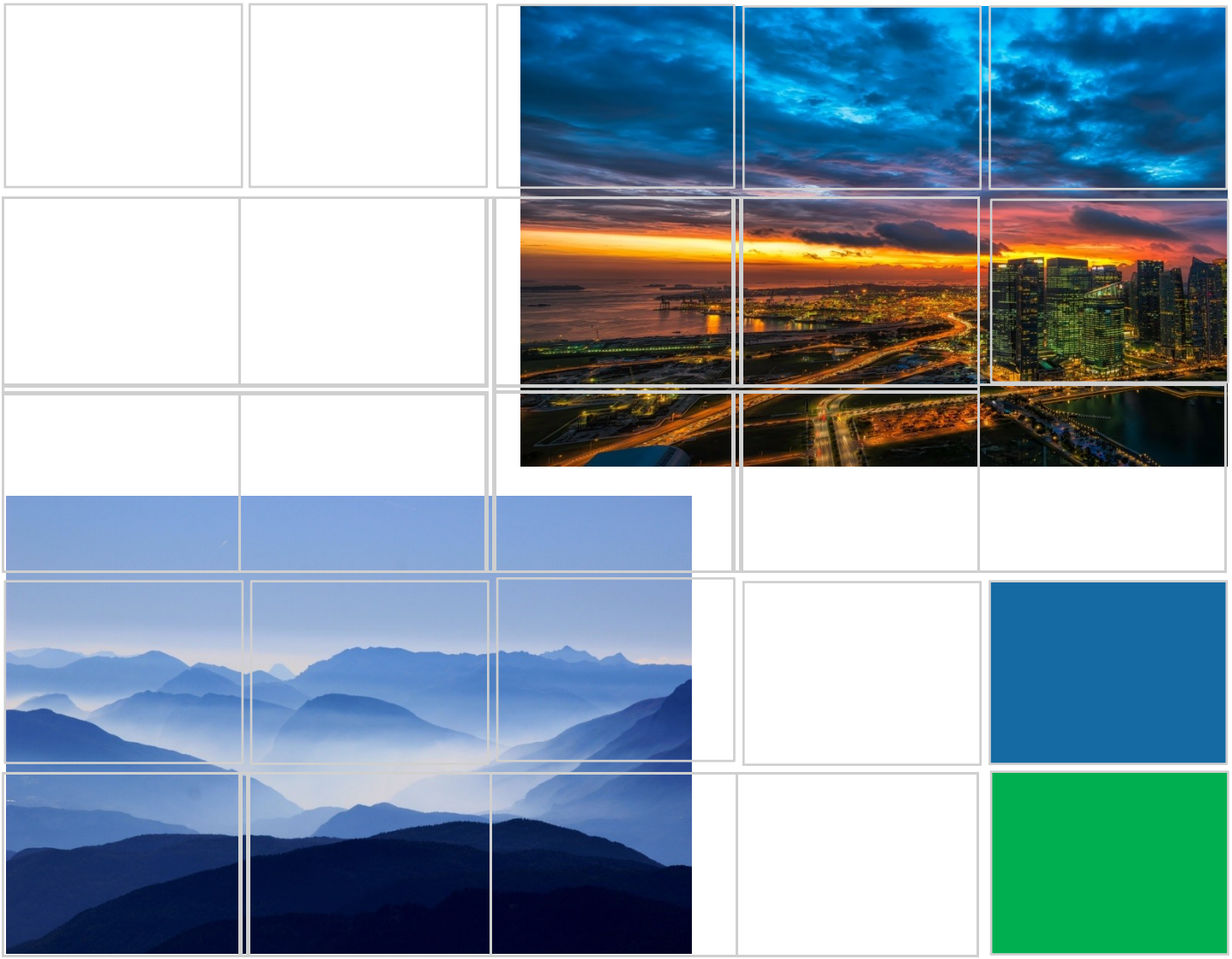

Statement of Qualifications and Current Business Plan Overview

December 1, 2016

For Potential Clients and their Brownfields, Re-Development, and Mining Projects

I2M Associates, LLC

River Oaks Tower
3730 Kirby Drive,
Suite 650
Houston, Texas 77098
713-807-0021

www.i2massociates.com

Associates, LLC

Statement of Qualifications

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Introduction

This is our statement of qualifications and experience (Q&E) and current business plan overview for I2M Associates, LLC (I2M) concerning environmental investigations, remediation and redevelopment of closed or abandoned industrial sites, including chemical plants, and mine sites with contaminated soils and groundwater containing heavy metals, solvents, pesticide-related chemicals and other hazardous chemicals. We also conduct mining investigations, from exploration program review to acquisition-merger evaluations, and environmental due diligence assessments in the U.S. and overseas (more). Additional information regarding our portfolio of services is provided in our business plan overview at the end of this document.

The Principals of I2M are our greatest asset; their experiences working together, now for more than 20 years, have brought success, recognition, and encouragement from our various clients and professional associates as well. Richard C. Bost, P.E., P.G., and Michael D. Campbell, P.G., P.H., began working together in 1987, as confirmed in the timelines of our curriculum vitae. The major companies, such as Law Engineering and Environmental, Inc., ERM, Inc., ENSR, and the DuPont Environmental Remediation Services (DERS), provided extensive training and exposure to complex industrial projects for the I2M Principals, as well as for many of the members of the I2M professional staff, most of whom are based in Houston, Texas.

We helped found what is now I2M Associates, LLC in 2010 with former owner, Jeffrey D. King, P.G., President and CEO (as the original co-founder, also ex-Law Engineering and ex-DuPont employee), Michael Campbell as Executive Vice President, and Chief Hydrogeologist and I2M co-founder, and Richard Bost, one of our first Senior Associates. Mr. Bost has recently become President and CEO of I2M (more) and serves as Chief Engineer of the remediation services group. Other I2M management and professional personnel bring experience in planning, permitting, natural resource and mining assessments, and in decades of managing Phase I and II soil and groundwater investigations, and associated remediation projects. For a complete review of the I2M personnel, see (more).

As part of a major expansion plan in 2016, Richard Bost, President of I2M, has announced the creation of I2M-Reardon, LLC for the specific purpose of providing services to consultants, and to state and federal government agencies. The spin-off group offers specialized remediation in soil, underlying sediments and shallow groundwater. The precursor company has operated over ten years using an innovative delivery system involving the injection of liquid inoculants into soil and underlying sediments, and in some cases, into the shallow groundwater just below the water table. The methods incorporated reduce both the time and cost associated with cleanups. By using In Situ Chemical Oxidation (ISCO), or other methods, contaminated areas can be characterized and remediated to avoid costly “dig and haul” methods of cleanup.

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Serving as the parent group, I2M is especially well suited to assist industrial and the federal government with a range of environmental investigations based on our collective experience and the successful track records of our Principals in addressing heavy metal, solvents, pesticide, radioactive constituents, and other hazardous chemicals in soils and groundwater at over many industrial and governmental sites in the U.S. and globally. For example, based on an EPA project reviewer, I2M Principals were the first consultants in the U.S. to obtain approval for bioremediation of toxaphene- and metals-contaminated soil at a former chemical manufacturing facility near Dallas, Texas for redevelopment as a city park. In addition, on another project, I2M completed a comprehensive review of a DOE facility that required no follow-up review of our report by DOE, a rare event in DOE circles.

As is reflected in our business expansion plan, I2M is currently capable of providing a comprehensive portfolio of environmental services backed up by a solid team of seasoned professionals, supporting consultants, and top-line subcontractors. We are anticipating adding offices and expanding our international offerings – in response to requests of our Houston-based and international clients.

As is evident from our Q&E case studies and the Qualifications and Experience described below, I2M Principals have followed a business-solution approach, we call “Experience In Action”, in completing 100’s of soil and groundwater remediation and redevelopment projects for commercial and industrial properties with heavy metals. solvents, and/or pesticides. I2M personnel have been recognized as leaders in the geosciences within the U.S., England, Europe, and Australia, and have been successful in applying state-of-art remedial technologies.

What separates us from our competitors are the following:

- The successful track record of our Principals and founders, typically saving millions of dollar equivalents in time and remediation costs,
- Our expertise and familiarity with the well-entrenched and developing remediation technologies,
- Our domestic and international experience and reputation,
- Our integrated-team approach working with our developer clients and governmental authorities to streamline the permitting approval process, focus remediation and reduce redevelopment costs in returning “brownfield” sites to commercial use to support local sustainable economic redevelopment, and
- Our regulatory development experience working with parties in North America, Australia, Great Britain, Europe, S.E. Asia, Africa, Latin America, Russia, South America and in developing appropriate regulatory strategies for permitting new redevelopment on once useless real estate.

I2M Approach

No single remedial technology will suit every situation, as our clients can attest. Depending on the threat for exposure and the time constraints and objectives of the client, an active, quicker but more expensive technique may be more desirable than a slower but less expensive technique. I2M works with our clients to identify the most cost-effective strategy and business solution to meet their project schedule and budget.

I2M Management works with clients to obtain permits and meet regulations, and will provide qualified contractors for the earthwork, equipment, transportation, and disposal aspects of projects. Structures can be demolished and removed, as needed, before I2M initiates characterization and remediation at the sites.

Typically, characterization and remediation work will be performed under the supervision of the I2M Principals who will be responsible for ultimately recommending the remediation technology implemented. Specialized equipment will usually be provided by I2M but we find that the actual way in which local contracting will be accomplished can be discussed and agreed as the scope of remediation is developed and defined.

This introduction to the I2M SOQ provides a general overview of our experience and qualifications for characterization, remediation and re-development projects. As indicated above, we also have spun-off a separate group (I2M-Reardon, LLC) to work with consultants to avoid competition and to provide support of their services to their clients by contractual agreement.

A list of references for selected I2M projects related to remediation in various chemical plants and industrial/commercial sites is included below:

Following are a few examples of our experience; individual case studies are provided later in this SOQ:

- **Weyerhaeuser, DuPont Chemical Plant Site Redevelopment, DuPont, Washington, U.S.**

  As an example, Pacific Environmental Remediation Corporation (PERC) (owned by Jeff King, and previous owner of I2M) evaluated several alternative remedial technologies to remediate an 880-acre site in DuPont, Washington in order to meet the regulatory and redevelopment deadlines associated with the project.

- **Aidex Pesticide Chemical Plant Redevelopment, Council Bluffs, Iowa, U.S.**

  At the first federally designated “Super (Waste) Fund” site redeveloped in the U.S., one of our Principals conducted a supplemental soil investigation and remedial evaluation at the 80-acre Aidex Pesticide Formulation and Manufacturing Plant near Council Bluffs, Iowa, that facilitated a reversal of the initial position of the U.S. Environmental Protection Agency and saved over $30 million in presumptive remediation costs and allowed the site to be redeveloped in less than a year.

- **Hardage Industrial Waste Disposal Plant, Criner, Oklahoma, U.S.**

  At another federally designated "Superfund" site, one of our Principals demonstrated during a regulatory hearing that a $60 million remedy, rather than a $274 million, was the safest and fastest approach for remediating over a million cubic feet of soil at the 600-acre site contaminated with various heavy metals, pesticides, chlorinated solvents, and various U.S. Air Force defense related wastes.

- **Precision National Site (Superfund), Clarks Summit, Pennsylvania, U.S.**

  The 46-acre Precision National Plating Site is located in Clarks Summit, Pennsylvania. The site began operation as a chromium electroplating facility for locomotive crankshafts in 1956 and continued this operation until 1999 when it was closed. Using U.S. Environmental Protection Agency guidance, Precision National then calculated a soil cleanup level of 60 mg/Kg of hexavalent chromium in soil in order to meet the 11 ug/L hexavalent chromium standard for the receiving surface waters in a nearby creek.

- **Phase 1 East Flats $300 Million "Brownfield" Industrial Site Redevelopment Project - Cleveland, Ohio, U.S.**

  East Flats Development retained us to identify and design the remedial action required to address the petroleum non-aqueous phase liquids (NAPLs) and hydrocarbon soil contamination at East Flats 20-acre site (Site), located in Cleveland, OH. At this site the manufactured gas product (MGP) NAPL was delineated in the site soils within multiple affected areas (approximately 24,000 ft.). The selected remedy was in situ chemical oxidation (ISCO) to affect the destruction of the NAPL free product to the applicable OHIO standards of less than 1/8 inch of free product and concentrations of petroleum products in the soil to be less than soil saturation levels. Site closure was successfully obtained quickly and within the site development schedule.

- **DuPont, U.S. and International**

  For one of our major clients, our principals helped develop the soil remediation strategy and provided managerial oversight of the soil remediation at over 20 chemical plant sites globally, with a total remediation and redevelopment budget of over $1.8 Billion in 1995 dollars ($2.8 Billion in today's dollars). Where appropriate, our principals gained approval of the permitting authority agency for natural attenuation of the soils at much lower costs. An example of this is the East End Senior Community Center in Houston, Texas.

- **Ashley River Industrial Park Redevelopment District – Charleston, South Carolina, U.S.**

  As an example of a very visible and highly successful project for DuPont, I2M Principals provided contaminated soil assessment, source identification, remedial strategy development and oversight of initial remediation activities as well as liability allocation trial support in what is referred to as the "Dent" case. As a result of our focused and expedited field activities, what initially appeared to be a disastrous redevelopment project gone wrong with huge liabilities, was turned around and converted into a case study for DuPont and the legal community on how to address "Superfund" liabilities and engage state-of-the-art soil investigation and remediation technologies to reduce and expedite site characterization and remediation costs. In this project, the estimated savings exceeded $350 million and resulted in successful redevelopment of the industrial district.

- **Joplin Lead-Zinc Characterization and Remediation Project – Joplin, Missouri and Area**

  Underground mining of lead and other commodities were of historical importance to the area in years past, but such operations left behind millions of tons of waste piles containing anomalous lead and associated constituents of concern scattered over the surface of southwestern Missouri and northeastern Oklahoma. Of the 8 Principal Responsible Parties (PRPs), DuPont was represented by one of the I2M Principals (Campbell), while the PRP group's consultant (ERM) was presented by the other I2M Principal (Bost). The PRP group provided oversight for ERM's comprehensive characterization involving air monitoring, soil sampling in multiple neighborhoods, groundwater sampling, and risk assessment.

Please feel free to contact our references for the above projects presented later in this SOQ.

The I2M standard approach for industrial sites is to complete initial site investigations involving historical review, and assessment of the constituents of concern, and their surface and subsurface characterization, followed by treatability studies to review and identify the appropriate technologies for controlling remediation costs and/or expediting site redevelopment involving risk assessment. In the past years, we have completed well over 100 such projects. Some of the I2M case studies are described with site photos in the descriptions that follow.

To best suit the Client's needs, the project team would consist of key I2M professionals familiar with the particular contaminant of concern and site conditions. The team will be led by Mr. Richard C. Bost, P.E., P.G. as the Chief Remediation and Quality-Control Principal, together with Mr. Michael D. Campbell, P.G., P.H., as the Chief Hydrogeologist responsible for site characterization, led by supporting geological, engineering, permitting, and support staff from ourHouston office.

The I2M support staff and specialized subcontractors will provide administrative functions of the projects and support site redevelopment planning, permitting, logistics, and scheduling. Please refer to the professional profiles that follow in this document.

In any project, the first step will be to meet face-to-face to get comfortable with the client-consultant relationship and to discuss the likely scope of work. Our qualifications will be included in an integrated qualification/proposal presented to the Client. Should you decide to select I2M Associates, LLC, the next step is to execute an agreement to proceed with the project.

We look forward to assisting you in dealing with your environmental concerns. Please feel free to call us with any questions regarding our qualifications and experience.

Sincerely,

I2M Associates, LLC

Richard C. Bost, P.E., P.G.
President, Chief Engineer

Attachment

CC: Michael D. Campbell, P.G., P.H., EVP and Chief Geologist/Chief Hydrogeologist

I2M Principals, Curriculum Vitae

Richard C. Bost, P.E., P.G.

PRESIDENT, CEO, and CHIEF ENGINEER

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LLC Houston,
Texas

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Email: rcb@i2massociates.com
Corporate Website Resume: http://i2massociates.com/richard-c-bost-pe

Education

- M.P.H. studies, Urban Health – University of Texas (1977-78)
- M.E. Environmental Engineering - Rice University (1978)
- B.A. Environmental Sciences and Engineering - Rice University (1976)
- Co-Recipient of grants from NSF, EPA, HEW, and API; reviewer for National Science Foundation

Professional Papers

- Authored numerous papers and articles (see below)

Professional Affiliations

- Association of Ground Water Scientists and Engineers
- Association of Civil Engineers
- American Chemical Society
- Air & Waste Management Association

Registration

- Licensed Geoscientist (Soils), Texas, and
- Environmental Engineer, Texas.

Honors

- 2009 Knobbey Award for Community Service
- 2005 Houston Old Sixth Ward Brownfield Award
- 2005 CEC Environmental Synergy Honoree
- 2002 Outstanding Alumnus Award- Rice University "for contributions to field of engineering"
- Appointed by Texas Governor to Task Force 21, Regulatory Development Advisory Committee
- Hugh Scott Cameron Community Service Award
- 2001 Houston Community Partner Award for Brownfield Redevelopment
- Research application reviewer for National Science Foundation

Fields of Specialty

- Environmental and chemical engineering

- Hydrology and soil science
- Industrial operation siting and permitting
- Chemical plant expansions, redevelopment and decommissioning and associated permitting
- Site, fuel, water, technology, and power transmission alternative analyses.
- Chemical and petroleum storage tank design, leak detection, testing, permitting & compliance
- Superfund Site assessments, investigations, source identification, allocation, remediation and risk assessments.
- Water, air, sediment transport, flooding, natural attenuation and water rights
- Waste/wastewater management/waste unit design
- Release cause analyses, fate & transport of releases and assessment of natural resource damages
- Environmental permitting and compliance management and auditing, including environmental liability assessments for SEC filings and insurance
- Environmental forensics and source identification
- Risk assessment, epidemiology, public health, remediation and Clean Water Act and NCP compliance
- Environmental exposure and risk assessments under RCRA, Superfund, and OSHA as well as public health exposure assessments and controls

Chronological Professional Experience

I2M Associates, LLC (I2M) – 2010- Present

Environmental Resources Management (ERM) – 1988- 2010

Previous Companies ??? – 1978- 1988

Work History - Selected Projects

- Provided technical strategy and direction for soil assessment, remediation, and redevelopment of the Aidex Pesticide Manufacturing Facility, the First US "Super (Waste) Fund" site cleaned up and returned to commercial use.
- Served as technical consultant for the architectural design of the East Houston Senior Living Facility and Community Center, a redevelopment of the West Houston Heavy Industrial Site with funding from DuPont Conoco. Scope of services included assessing soil contamination, developing in-situ soil treatment, and overseeing final site cleanup and demolition and initial site redevelopment activities. Project won a National Award for Brownfield Redevelopment.
- Secured EPA $250,000 "brownfield" funding for a former medical treatment and manufacturing site, dating to the Civil War. Managed and directed site soil investigation, remediation, historic preservation, archeological investigation, and

site re-permitting for affordable housing and community center in the old 6th Ward of Houston, Texas. Project won a National Award from EPA for innovative redevelopment strategies.

- Testified in successful hearing to allow permit for commercial redevelopment project in Montgomery County Texas.
- Led due diligence team for Duke Energy's acquisition of Pan Energy 30,000 miles of pipeline and refineries and LNG facilities and terminals in Europe, US and Latin America.
- Technical consultant for redevelopment of closed industrial properties for redevelopment as commercial "marina" mall and new port operations, for ports in Hong Kong, Mexico, California, Mississippi, Mobile, Bia de Blanca in Argentina, Chad/Cameroon Oil and Gas project, Niger, United Arab Republic, Egypt, and Houston.
- Provided expert testimony in industrial redevelopment hearing regarding disposal and treatment alternatives, public interest, geological considerations, sustainability and market demand issues.
- Operations consultant for permitting and redevelopment of industrial sites for conversion into the Strategic Petroleum Reserve.
- Managed corrective action for DuPont chemical plant redevelopment for 8 sites in southern US.
- Due diligence assessments for chemical plants, refineries, and commercial redevelopments in 33 states in US.
- Consultation services relative to development of brine injection regulations for Peoples Republic of China.
- Consultative services relative to development of hazardous wastes and chemical handling for Hong Kong.
- Provided input into World Bank and equator principle guidelines for redevelopment of industrial areas located in Africa and Latin America.
- Contractor to State of Louisiana relative to remediation and redevelopment of 8 Superfund Sites.
- Led investigation and remediation team for demolition, clean up and redevelopment of former Agent Orange and chloro-phenoxy herbicide and arsenical pesticide manufacturing plants in 5 states in US.
- Led investigation and remediation team for 1100 acre Doune Lake Industrial Park allocation and redevelopment near Willamette River in Oregon.
- Expert consulting relative to hazardous waste unit design & management, retrofitting, permitting, and closure, including closure of lagoons, ponds and landfills in multiple states.
- Expert services regarding surface water, ground water and air release damage claims related to power plant and lignite mining operations, oil and gas production activities, refinery, petrochemical and chemical plant upsets and releases, pipeline releases and derailments.
- Provided expert consulting relative to 23 "Brownfield" redevelopment projects in multiple states.
- Expert consultant to investigation and remediation teams for over 40 industrial plant areas at Superfund Sites in Oklahoma, California, Washington, Pennsylvania,

Indiana, Texas, Louisiana, South Carolina, Arkansas and New Jersey; expert reports were cited

- in Federal Court rulings in favor of clients and overrule of EPA remedy selection, resulting in savings of over billion dollars for our clients.
- Withstood Daubert-like challenges in federal courts in California, Oregon, South Carolina, Arkansas, Oklahoma, and Texas regarding air, water, waste and development impact issues.

Additional Honors and Awards

- 2002 Houston Community Garden Program Founders Award
- 2001 Houston Latino Learning Center Community Service Award for Eastwood Redevelopment Project
- Boy Scouts of America: Eagle, God and Country, Order of the Arrow
- 1997 ERM Excellence Award in Risk-Based Closures
- 1998 ERM Excellence Award for Advancements in Biological treatment of pesticides and chlorinated chemicals
- 1999 ERM Excellence Award for Advancements in Environmental Forensics Fingerprinting for Dioxins

Selected Publications

- Bost, R. C., *et al*. 2009 through 2016, Papers and presentations on Brownfield and Superfund site remedial technologies, oil and gas development, sustainability, evaluation of surface water impacts from agricultural operations, environmental forensics, waste water management planning, and urban redevelopment issues, presented internationally at conferences in Australia, Mexico, US and Canada
- Bost, R. C., L. K. Magyar, and M. D. Campbell, 2015, "Environmental, Health, and Property Damage Issues Raised by Litigants …," Gas Mexico Congress and Exhibition, GMC15 - 149, 8 p.
- Campbell, M. D., M. David Campbell, H. M. Wise, and R. C. Bost, 2014, *Growth Faulting and Subsidence in the Houston, Texas Area*, A Report for the Institute of Environmental Technology, Houston, Texas.
- Bost, R.C., *et al*. 2008 A Series of papers on sustainability, biofuel project development, international permitting, environmental compliance, release cause analyses, environmental forensics, & due diligence.
- Bost, R.C., *et al*. 2007 A Series of papers on environmental compliance, evaluation of water treatment and remediation options, environmental forensics, and environmental impact/natural resource and liability assessments.
- Bost, R.C., 2006. Selection and Management of Environmental Experts, in *Perchlorate Litigation*, 2006, invited chapter.
- Bost, 2005. Optimization in a Clayey Environment. Proceedings, *Conference on Recalcitrant Remediation*
- Campbell, M. D. and R. C. Bost, 2004-2005. Three-Part Paper on Effect of Daubert on Environmental Assessments and Investigations", NGWA/ABA Proceedings.
- Bost, R. C., Moya, O.L., Fono, A.L., invited chapter, in progress, Technical and

Legal Requirements for Liability Allocation, Daubert Challenges and TSCA Modelling, Federal Environmental Law User's Guide.

- Bradley III, D.D. Perry, R.G., and Bost, R.C., 1999. Source Fingerprinting as a Basis for Superfund Cost Allocation: Confidential Site in United States. ERM Excellence Technical Award Winner.
- Bost, R.C., L.M. Burris-Glasgow, December 1998. Latino Learning Center: A Brownfields Success Story. Texas VCP News published by VCP Program of the TNRCC.
- Bost, R.C., T.H. Hall, June 1998. Use of Statistical Procedures to Aid in Waste Classification at a Superfund Site. ERM Excellence Award Winner.

- Bost, R.C., July 1996. Consistency with the National Contingency Plan, A Requirement for Real Estate Claims Against Contributors to Pollution, Environmental Strategies for Real Estate.

- Bost, R.C., May 1996. Environmental Risk Assessments: Achieving Acceptable Cleanup Levels at Lower Cost, Environmental Strategies for Real Estate, Volume 3, No. 8, Westwood, New Jersey.
- Bost, R.C., April 2, 1996. Enhancement of Intrinsic (In Situ) Bioremediation of Chlorinated Solvents, Sponsored by U.S. Air Force in Cooperation with Battelle, et al.
- Bost, R.C., September 19, 1996. The Who, What, Where, When & How of Spills & Release Reporting and Superfund Liability. Executive Enterprises, New Orleans, LA.
- Bost, R.C., 1996. Allocating liability, evaluating remedial options, assessing natural attenuation and differentiating between different sources of petroleum and chlorinated organic chemicals. Institute of Environmental Technology, Houston, Texas.
- Bost, R. C. and T. Barber, 1996. Bioremediation and Water Treatment for Site Redevelopment, Houston Geological Society invited lecture.
- Campbell, M. D. and R. C. Bost, 1996. Compendium of Lectures in Environmental Technology, Institute of Environmental Technology, Houston, Texas.
- Bost, R.C. and L.R. Cooper, March 7, 1996. Voluntary Cleanup and Risk-Based Redevelopment of Brownfield Properties, Brownfields Satellite Teleconference, co-sponsored by ABA, AWMA, EPA
- Bost, R.C., January 18, 1996. Role of Risk-Based Corrective Action in Property Redevelopment Transactions, ASCE Annual Conference, Houston.
- Bost, R.C., 1996. Risk-Based Cleanup of Industrial Properties discussing limitations of modeling and remediation, Journal of Hydrology, also given at joint US-Soviet Union conferences, St. Petersburg, and Washington, D.C. 1990 and 1994.

For a complete list of Mr. Bost's publications and presentations, see (here)

Michael D. Campbell, P.G., P.H.

EXECUTIVE VICE PRESIDENT and
CHIEF GEOLOGIST (Mining) /
CHIEF HYDROGEOLOGIST (Environmental)

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Education

- 1976, M.A. , in Geology, Rice University, Houston, Texas, under an *Eleanor and Mills Bennett Fellowship,* with courses in geology and geophysics. Additional 31 graduate hours toward Ph.D. Thesis: *Paleoenvironmental and Diagenetic Implications of Selected Siderite Zones and Associated Sediments in the Upper Atoka Formation, Arkoma Basin, Oklahoma-Arkansas*, 124 p.
- 1966, B.A., in Geology, The Ohio State University, Columbus, Ohio, with additional courses in the Hydrogeology Program, and served as Undergraduate Research Assistant. Scientific German Secondary Field of Specialty. He began college in 1961 in southern California (at San Bernardino Valley College, taking undergraduate courses including: geology, chemistry, engineering drawing, etc. Transferred to OSU in 1962.

Selected Professional Memberships / Affiliations

- Association of Ground Water Scientists and Engineers (AGWSE)
- American Association of Petroleum Geologists
- American Institute of Hydrology (AIH), Recertification, 2004, Dues: 2015, 2016
- Association of Geoscientists for International Development (AGID): 1976 to 1995
- European Association of Geoscientists and Engineers (EAGE), Near Surface Geoscience Div. (NSGD)
- European Federation of Geologists

Selected Professional Licenses / Certifications / Registrations

- Professional Geoscientist (Geology) Licenses (Texas, Louisiana, Mississippi, Wyoming, Washington, Alaska)
- Professional Hydrogeologist License (Washington)
- Certified Professional Geologist (AIPG #3330)
- Certified Professional Hydrogeologist (AIH #480)
- Titled as *European Geologist* by the European Federation of Geologists (#1132)
- Elected as Fellow of the Geological Society of America

- Elected as Fellow of the Australian Institute of Geoscientists
- Elected as a Fellow and Chartered Geologist in Geological Society of London (#1023626)
- Registered Member - Society of Mining and Exploration (#479440).

Career Summary

Mr. Campbell is well-known nationally and internationally for his work as a technical leader, program manager, consultant and lecturer in hydrogeology, many aspects of mining, and associated environmental and geotechnical fields. He has gained a wide range of interdisciplinary experience in business (mergers and acquisitions) and technical management in the environmental (regulatory, geological and hydrogeological), mining, and financial fields spanning more than 40 years.

Mr. Campbell provided management consulting for a mining project (with revenues /expenses of more than $8 million/year) and as a principal consultant for exploration, mining, processing/refining and environmental activities. Over the past 25 years, he has provided senior technical guidance, review, training, litigation support and consultation on numerous hydrogeological, water supplies, and hazardous waste projects involved in both RCRA and CERCLA programs for major law firms and consulting engineering and environmental companies as well as industry.

Mr. Campbell was the Regional Technical Manager and Chief Hydrogeologist for the Central Division of DuPont Environmental Services group based in Houston, Texas. He had line responsibility for the six Departments and represented DuPont as a PRP in a number of Superfund projects.

Chronological Professional Experience

2010-Present: I2M Associates, LLC., Executive Vice President and Chief Geologist / Principal Hydrogeologist, Houston, Texas. Mr. Campbell, in cooperation with a number of senior Associates, is employed by the recently reorganized company in Texas to expand the scale of a number of projects in the U.S. and overseas. Mr. Campbell manages the I2M team of Associates for investigations group in providing consulting services ranging from Phase I and Phase II environmental investigations to projects involving uranium, gold, base metals, and other commodities, such as potash and geothermal energy, combined with the associated environmental projects located in the U.S. and overseas.

Mr. Campbell served as the Principal Hydrogeologist for a Washington State Superfund project operated by PERC, (once the parent company to I2M Associates, LLC) for DuPont, and conducted investigations of groundwater flow in response to the diurnal tides that control the groundwater flow, and associated arsenic and lead contamination present in the Shallow Aquifer below the subject plant site.

As Chief Geologist, since 2009, he has conducted a number of investigations of potash, gold, silver and uranium deposits associated with mining properties in Queensland,

Tasmania, and South Australia in Australia, and in northern Vietnam for the purposes of NI 43-101 and Competent Persons Reports, and for assessments involved in mergers and acquisitions for public companies on the Australian, Canadian, and London stock exchanges.

1995-2010: M. D. Campbell and Associates, L.P., Senior Consulting Hydrogeologist and Principal-in-Charge, Houston, Texas. Mr. Campbell and a small support staff serve industry by providing technical consulting on RCRA, CERCLA and related waste management involving a range of contaminants such as BTEX, solvents, brine, etc., risk assessment projects, and water-supply projects in Texas, the US and overseas. Mr. Campbell provides project/document review, and technical and QA/QC training for industry, consulting companies and law firms for RCRA, Superfund, and mining-related projects. He designs, lectures, and produces formal technical short courses and semester-long courses on environmental science, engineering and technology, and in *pro bono* in the 1990s, he has served on the Editorial Board of the *Journal of Applied Ground-Water Protection* sponsored by the Ground-Water Protection Council, and served as Special Editor for the journal: *Ground Water until 2005*.

1991-1995: DuPont Environmental Remediation Services (DERS), Houston, Texas - Regional Technical Manager and Chief Hydrogeologist. The firm is a wholly-owned subsidiary of E. I. DuPont de Nemours. As Regional Technical Manager, Mr. Campbell managed the activities of the Technical Group serving DuPont plants and other plants over a seven-state area. He managed five operating departments, including Geology, Environmental Specialties, Deepwell (Injection Well), Conceptual Engineering, and Engineering /Construction, involving approximately 60 technical personnel. He provided technical and administrative leadership and oversight, staff recruitment, training, quality control/assurance, risk assessment on various DuPont projects and represented DuPont on technical committees in Superfund projects in the U.S.

1990: ENSR Consulting and Engineering, Houston, Texas - Regional Director of Geosciences and Chief Hydrogeologist. The firm is a leading environmental services firm specializing in RCRA and CERCLA projects for industry. Mr. Campbell provided senior technical review, managerial direction, guidance, and leadership to the hydrogeologic and geologic staff throughout the company's 22 offices in the US. He also provided and managed regular technical training sessions and performed quality control, assurance functions and litigation support for hydrogeologic projects (i.e., RCRA, CERCLA: Superfund and UST, and landfill investigations). He also initiated, guided and supported marketing efforts in environmental projects.

1987-1990: Law Engineering, Inc., Houston, Texas - Senior Hydrogeologist and Corporate Hydrogeological Consultant. Firm was a large employee-owned geotechnical and environmental engineering company founded in the early 1940's. Mr. Campbell provided senior technical direction, guidance, leadership and motivation to the hydrogeologic staff for the company's 52 offices in the US and overseas on hazardous waste projects including UST, landfill, water supply, dewatering, and RCRA (Part B Permits) and CERCLA (Property Environmental Assessments: Stage I and II projects, and

Superfund investigations and representations), including litigation support and expert witness testimony. He was responsible for initiating, guiding and supporting marketing efforts in environmental and relevant geotechnical projects.

1982-1987: Campbell, Foss & Buchanan, Inc., Houston, Texas - President and Senior Partner. Firm engaged in domestic and international environmental and natural resource management projects involving geological, hydrogeological and engineering programs: environmental investigations and characterizations (Part B Permitting, and Property Transfer Assessments), mine dewatering, project management (RCRA Investigations), natural resource assessment, reserve analysis and acquisitions for industry, mining (Alaska) and Utah), financial, and banking communities. Precious metal discovery credited in Nevada. Provided consulting services on an $8- million/year precious metal mining and cyanide heap-leaching project from discovery through development operations and environmental liaison with state and federal regulatory agencies. As part of these services, Mr. Campbell provided guidance and consultation in the daily review and monitoring of the financial and operational activities of the 50-person mining company. In addition, he also served numerous other companies and consulting groups in senior review functions on hazardous waste and RCRA refinery and plant investigations during the period.

1976-1982: Keplinger and Associates, Inc., Houston, Texas - Director, Alternate Energy, Minerals and Environmental Division. Formed group and defined marketing objectives in 1976. Responsible for and managed all non-oil & gas projects: alternate energy (coal/lignite, geothermal energy, uranium), minerals (precious and base metals and industrial commodities-phosphate, potash, sand & gravel, and related environmental projects involving property transfer assessments (Pre-CERCLA activities) for joint-venture negotiations, corporate mergers, and buyouts, financial and litigation preparations, hazardous waste investigations (RCRA Part A and Part B Permitting), geotechnical projects (dewatering), and water resource investigations. He also was appointed to an expert's committee of the United Nations ground water exploration and development program from 1978 to 1983. Mr. Campbell managed a staff of seven geologists, engineers and specialty consultants. He also presented seminars on a range of subjects involving environmental, hydrogeological, and water-supply issues.

1971-1976: NWWA Research Facility, Columbus, Ohio and Houston, Texas - Director of Research. Co-founded in 1971 and served as first Director of Research. Mr. Campbell conceived, formulated, supervised and conducted investigations on: water well technology, groundwater contamination and investigation practices and procedures, well construction standards, injection well systems' operation & maintenance, rural water systems' planning and engineering. Mr. Campbell was responsible for the early research programs funded by the U.S. Office of Water Resources Research, and in the development of EPA's early protocol development and characterization of ground-water contamination and remediation practices (Early RCRA and CERCLA). He moved the NWWA Research Facility and staff of 4 to Rice University in 1973, where research on EPA-related projects continued to 1976.

1969-1971: Teton Exploration, Div., United Nuclear Corporation, Casper, Wyoming - District Geologist/Hydrogeologist, Eastern US and Canada. Mr. Campbell was responsible for mineral prospect generation (with emphasis on uranium and other strata-bound mineralization) and for field reconnaissance, mapping, sampling, drilling site operations, recommendations for land acquisition and project budgeting and execution. He also conducted research on the hydrochemistry of the Morton Ranch uranium geochemical cell and nature of mine dewatering and water-supply development in and around the deposit, including the nature of abandoned drill holes plugged with bentonite muds. He advanced the development of hydrochemistry and geochemistry as an aid to frontier uranium exploration and for developing models of mineralization in frontier exploration areas.

1966-1969: Continental Oil Company (of Australia), Sydney, Australia - Staff Geologist/Hydrogeologist, CONOCO Minerals and Mining Division. Mr. Campbell was responsible for conducting, coordinating, and implementing prospect evaluations, mapping and sampling programs, well-site operations, and groundwater supply programs in various parts of Australia, Micronesia (Caroline Islands) and the South Pacific for: phosphate, potash, sulfur, coal, base metals, and uranium. Phosphate discovery credited in NT. Also investigated a new uranium district on the Nullabar Plains of South Australia (see publications list in CV). Joint-venture programs with Japanese and Korean companies required extensive travel between Australia and Japan and Southeast Asia.

Selected Publications and Presentations:

- Bost, R. C., L. K. Magyar, and M. D. Campbell, 2015, "Environmental, Health, and Property Damage Issues Raised by Litigants …," Gas Mexico Congress and Exhibition, GMC15 - 149, 8 p.
- Campbell, M. D., M. David Campbell, H. M. Wise, and R. C. Bost, 2014, *Growth Faulting and Subsidence in the Houston, Texas Area,* A Report for the Institute of Environmental Technology, Houston, Texas.
- Campbell, M. D., 2013, "Review of Liability and Loss Prevention in the Geological Business," An Invited Presentation to the Environmental and Engineering Group of the Houston Geological Society, Houston, Texas, March 13.
- Campbell, M. D., and M. David Campbell, 2004, "Crises Management: Groundwater in 21st Century," in Chinese Journal: *EnviroTechnology*, No .3, pp. 78-81.
- Bost, R. C., M. D. Campbell, M. David Campbell, T. R. Eckols and Andrew L. Fono , 2005, "Flawed Geoscience in Forensic Environmental Investigations: Part II: How Daubert Affects the Scope and Bases for Expert Opinions" NGWA Environmental Law & Ground Water Conference, Baltimore, MD., July 21- 22.
- Bost, R. C., M. D. Campbell, M. David Campbell, T. R. Eckols, and Andrew L. Fono, 2005, "Flawed Geoscience in Forensic Environmental Investigations: Part III: How Daubert Is a Surrogate for Ethical Questions Regarding Expert Opinions" NGWA Environmental Law & Ground Water Conference, Baltimore, MD., July 21-22.
- Campbell, M. D., R. C. Bost, and M. David Campbell, *2004, "Flawed Geoscience in Forensic Environmental Investigations: Part I: The Effect of Daubert Challenges on Improving Investigations"* NGWA Environmental Law & Ground Water Conference, Chicago, IL, May 5-6

- Campbell, M. D., 1999, "The Role of Environmental Technology in Developing, Maintaining, and Protecting Ground-Water Supplies in the 21st Century," in *The U.S. Water Report*, Saringa Group, Inc., San Francisco, CA, pp. 264-271. Peer Reviewed.
- Campbell, M. D., 1996 (95,94,93 & 92), "Ground-Water Modeling: Practices & Pitfalls," *Proc. Introduction to Environmental Technology*, Spring Semesters, Institute of Environmental Technology and Houston Engineering and Scientific Society, 97 p.
- Campbell, M. D., 1994, "Estimating Hydraulic Conductivity for Evaluating Contaminant Transport," An Invited Presentation, Houston Geological Society, Environmental / Engineering Monthly Meeting Abstract: HGS Bull., Vol. 36, No. 6, p. 19.
- Campbell, M. D., 1993, "Guidance on the Selection, Design and Testing of Vapor Extraction Systems," Campbell and Associates Report (Private Distribution), October, 6 p.
- Campbell, M. D., *et al.*, 1979, *A Review of the United Nations Ground Water Exploration and Development Programme in Developing Countries, 1962-1977*, United Nations, Natural Resources, Water Series No. 7, ST/ESA/90, New York, 84 p. Peer Reviewed.
- Campbell, M. D. and Hunt, W. A., 1973, "The Challenge of Environmental Protection and Industrial Development - An American Viewpoint," *in Proceedings of International Ground Water Symposium/Macquarie University*, Seminar 1: National Development - Session 3: "The Place for Private Water Supplies," Sydney, Australia, November 20-23, pp. 1-12

For a complete list of Mr. Campbell's publications and presentations, see (here)

Support Staff:

Melissa G. Freeman, Esq., Chief Legal Counsel

M. David Campbell, P.G., Chief Information Officer, Senior Program Manager & Senior Environmental / Mining Geologist

Amy J. Duncan, Chief Administrator

Other I2M Support Staff, Associates, Translators, and Interns (see more).

I2M Case Studies

Experience in Action

In Situ Chemical Oxidation (Brownfields Project) — Chloroform

Project at a Glance:

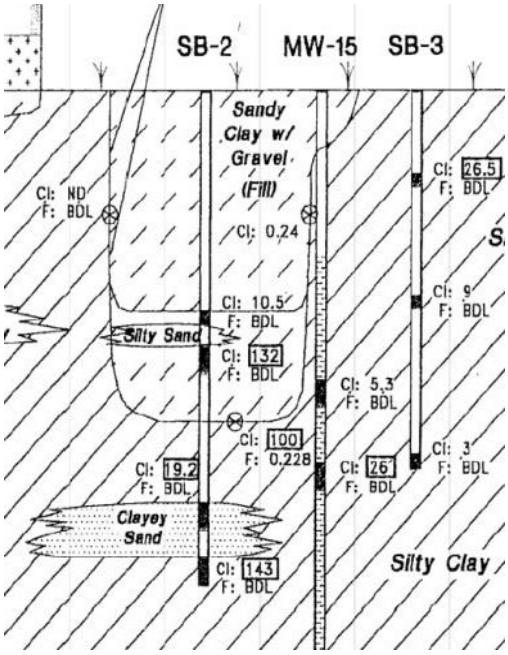
Facility:	**School and Training Facility Fort Worth, Texas**
Contamination:	**Chloroform in Soil and Groundwater**
Geology:	**Clay, Silty Clay to Sandy Clay Soils**
Results:	**Soils Reduced to Below Tier 1 Standards, Reduced to below 26 –42 mg/kg in all Soil Areas**

During Christmas Break, the School approved In situ (ISCO) Remediation using a modified Fenton's Reagent technique to address Chloroform concentrations in Soil Areas around MW-15 and MW-16.

In the Fall of 2002, a Work Plan was submitted to and approved by the Texas Commission of Environmental Quality (TCEQ) to address the VOC contaminated soil impacts associated with chloroform in two areas of former underground storage tanks and associated filter and sand traps. The objective of this plan was to achieve a remedy for the site to prevent COC's in the soil from leaching into the groundwater. Tier 1 Commercial/Industrial soil PCLs of 26 mg/kg shallow soil and 42 mg/kg deep soils was to be applied for the project. The application of Fenton's reagent in the selected hot-spots surrounding the former traps would oxidize the COC's to carbon dioxide and water and natural salts.

Target source areas were small so this approach was selected since the soils could be applied with treatment chemicals at depths to 25 feet with surgical treatment at specific depths where the treatment would be most effective.

Soils tested in the targeted areas showed results of 2.07 to 4.24 mg/kg after injection treatment.



Experience in Action – Creosote

In Situ Chemical Oxidation—

Potassium Permanganate Injection

Project at a Glance:

Facility:	**Wood Treatment Facility Denver, Colorado**
Contamination:	**Creosote in Groundwater**
Geology:	**Sandy Clay Soils**
Results:	**Solidification of Soils in Groundwater Regime**

I2M-REARDON injected over 120,000 gallons of 3 percent Potassium Permanganate in over 50 wells and several trench systems in one month

I2M-Reardon Environmental accomplished the project using state of the art Cycle Bin stand equipped with screw conveyor system and helix feeder with Loss-in-weight Scales and Controller system to accurately meter the Potassium Permanganate through fluid eductor system to a 21,000 gallon storage and batching tank.

The facility is currently an operating wood treatment facility which processes railroad ties and power poles with creosote treatment. The project is based on treating soil with KMnO4 in solution through multiple wells and trench systems to saturate soil deposits and migrate downgradient via groundwater flow. This is intended to stabilize the NAPL. At the 3 percent concentration, significant creosote removal will be accomplished as well as in the soil permeability.

This project was accomplished in less than 30 days with no residual potassium residuals after 120,000 gallons of blending.

Experience in Action

Insitu Chemical Oxidation (ISCO) — PCE

Groundwater Treatment System

Section Exposed for Treatment of Soil

Project at a Glance:

Facility:	**Chlorinated Industrial Site Longview, TX**
Contamination:	**PCE—Soil to 8 ft.** **GW from 8 to 16 ft.**
Geology:	**Clay and Sand below Pavement Slab**
Results:	**Soils Reduced to Below 0.05 mg/kg GW to 0.005 mg/l**

Advantages:

- In Place treatment of soil below the facility concrete pavement.
- *Operations Unaffected* Car traffic was allowed to continue during all soil and GW remediation work effort.

BenchTest

Bench Testing provided the selected treatment concentrations of 15-20% Hydrogen Peroxide for the soil and 5 to 10 grams per liter of Sodium Persulfate activated with chelated iron in a proprietary mixture for the ground.

Project Summary

The project was based on injecting below a concrete slab thickness of six (6) inches for ISCO treatment of the soils just below the pavement. Subsequent modification to the plan resulted in soil treatment in contained boxes then the soil was exactly replaced. For the groundwater zone an engineered treatment system was designed to blend a concentration of 5-10 percent sodium persulfate activated with iron and injected into a series of wells strategically placed. Project Successfully accepted by TCEQ.

Experience in Action

880-acre Manufacturing Area Contaminated with Heavy Metals & Residual Explosives

Project at a Glance:

Facility:	**DuPont Works Site Dupont, WA**
Consultant:	**I2M-Reardon Environmental Houston, TX**
State Environmental Agency:	**Washington Department of Ecology**

Site of the former explosives manufacturing facility had been burned, partially bulldozed and overgrown with vegetation when the remediation project began.

Safe, Effective Cleanup Beats Deadline & Saves $1.2 Million for Land Developer

Once part of an explosives manufacturing facility dating back to the early 1900s, the land had gone unused since the plant closed. Many decades later, Weyerhaeuser purchased the site as part of a 3,300-acre tract intended for a mixed-use real estate project. Before work on the real estate development could begin, the site required remediation to remove heavy metal and residual explosives that remained in the areas where numerous plant facilities had been located.

Spurred by an impending change in the Environmental Protection Agency's land disposal restriction (LOR) for handling hazardous wastes, Weyerhaeuser and the Pacific Environmental Remediation Corporation (PERC), and Jeff King, owner of PERC and previous owner of I2M Associates, LLC, promptly developed a remediation plan that focused first efforts on areas of significant heavy-metal contamination. Site work was scheduled so that hazardous waste would be treated or disposed of within 60 days, the time remaining before the new LOR restrictions were to take effect. Had the project not been completed before the new LOR restrictions went into effect, 4,000 tons of contaminated material would have required stabilization prior to disposal at an estimated cost of $1.2 million. In addition to processing this volume of waste, remediation crews deliberately initiated more than 50 detonations to clear out residual explosives remaining in the old nitroglycerin manufacturing and transferring areas over much of the property designed to optimize safety controls of the day. These blasts averaged 30 to 40 pounds of dynamite each, with some detonations requiring up to 200 pounds. Sympathetic detonations of residual materials left craters in the area the size of large trucks.

The next phase of the project required the excavation of more than 80,000 cubic yards of material, which had to be screened, stockpiled, and covered or disposed offsite. More than 1,500 55-gallon drums without lids, and partly filled with a mixture of rain water and chemicals, were disposed offsite.

Remediation of the former DuPont plant site was completed and the large property incorporated into the Northwest landing project developed by Weyerhaeuser, which included a world class golf course, the construction of which was managed by Jeff King (PERC).

Experience in Action - Chromium Superfund Site

In-Situ Soil Treatment — Hexavalent Chrome

ISCO injection of Calcium Polysulfide treatment in the Lagoon Area of the site.

Project at a Glance:

Facility:	**Precision National Site Clarks Summit, PA**
Consultant:	**National Consulting Firm, Somerville, NJ**
Federal Environmental Agency:	**EPA Region III Philadelphia, PA**

Injection Techniques

A totalof250,000gallonsof 3to 6%concentration of CalciumPolysulfidewas injected utilizing several methods and techniques:

- high pressure pumps at 5,000 psi;
- high volume low pressure pumps rated up to 80 gpm;
- and finally by gravity injection into multiple injectors feeding up to 30 well points at once.

Site History

The 46-acre Precision National Plating Site is located in Clarks Summit, Pennsylvania. The site began operation as a chromium electroplating facility for locomotive crankshafts in 1956 and continued this operation until 1999 when it was closed.

Performance Criteria

Using USEPA guidance, Precision National then calculated a soil cleanup level of 60 mg/Kg of hexavalent chromium in soil in order to meet the 11 ug/ L hexavalent chromium standard for waters tested in the creek. This soil cleanup level was approved by USEPA.

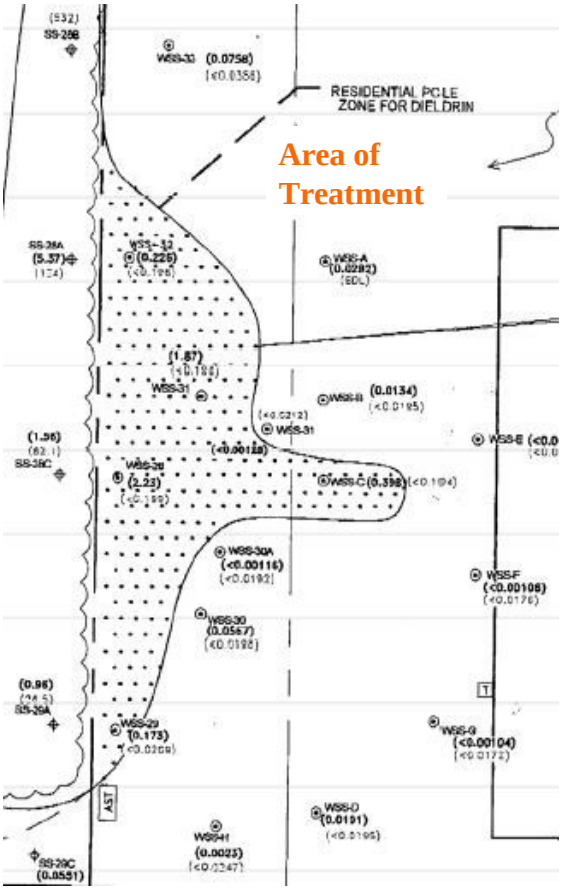
I2M personnel installed 22,000 gallons of storage and mixing tanks to provide a constant supply of Calcium Polysulfide for Injection Operations.

Experience in Action

In Situ Chemical Oxidation — Pesticides (*Dieldrin*)

Chemistry of Success

Fenton's Reagent (Hydrogen Peroxide) and Activated Sodium Persulfate



Project at a Glance:

Facility:	**Distribution Center Waco , Texas**
Contamination:	**Dieldrin**
Geology:	**Sand and Gravel below Pavement Slab**
Results:	**Soils Reduced to Below 0.15 mg/Kg**

Advantages

- In Place treatment of soil below the facility concrete pavement loading area.
- Operations Unaffected Truck traffic was allowed to continue during the remediation work effort.

Bench Test

Bench Testing provided the selected treatment concentrations of 15-20% Hydrogen Peroxide and 5 to 10 grams per liter of Sodium Persulfate in a proprietary mixture.

Project Summary

The project is based on injecting below a concrete slab thickness of six (6) inches for ISCO treatment of the soils just below the pavement. A total of 160 holes were drilled in the concrete where ISCO injections were delivered with a unique tool, specifically designed for this application. Most of the area was tested at target levels after two rounds of injection while hot spots received up to six rounds before meeting targets.

Experience in Action

ISCO + Stabilization — TPH, Lead & Arsenic

Chemistry of Success

Fenton's Reagent (Hydrogen Peroxide) with *treatment train* for metals - (Iron oxide and Tri-basic Calcium Phosphate)

Injection of Fenton's Reagent in Tank Storage Area

Project at a Glance:

Facility:	**Industrial Terminal** **Pasadena, Texas**
Contamination:	**TPH, Lead, Arsenic**
Geology:	**Sand and Gravel Backfill**
Results:	**Soils Reduced to Below 150 ppb**

Advantages

- *In Place treatment of soil around tank storage and piping.*
- *Operations Unaffected*
  No interference with operations during the remediation work effort.

Treatment of TPH in Soil

The actual process utilized in the oxidation is known as Fenton's Reagent. Hydrogen peroxide in the presence of iron salts or iron oxides which forms hydroxyl radicals (OH^-). The hydroxyl radicals react with organic compounds and cleave the petroleum hydrocarbon bonds, reducing the contaminants of concern to water and CO_2-.

Treatment of Metals (inorganics)

I2M-Reardon treated the metals contaminated soil by injecting Tribasic Calcium Phosphate and Iron Oxide. These chemicals were found to be highly effective in pilot testing at the site where the average reduction of 90 percent was achieved.

Experience in Action

Development of Cost-Effective Closure Approaches for Inactive Impoundments

Project at a Glance:

Facility:	**Confidential Chemical and Plastics Manufacturing Plants**
Contamination:	**Sludge disposal impoundments and wastewater treatment lagoons**
Geology:	**Clay, Silty Clay to Sandy Clay Soils**
Results:	**Obtained regulatory agency acceptance of novel approach to capping waste**

The Situation

A chemical manufacturing client operates two large hydrocarbon processing facilities on the Texas Gulf Coast. Both facilities contain hundreds of acres of sludge disposal impoundments and wastewater treatment lagoons. Many of these impoundments are inactive, are implicated as sources of ground water contamination, and are subject to RCRA Corrective Action requirements. Closing these impoundments in the traditional manner with sludge solidification and placement of low permeability caps would be cost prohibitive, given their size.

Results:

Successfully obtained approval from the agency to allow client to:

- Replace a 3.5-foot compacted clay and FML cap with a 6-inch thick, lightweight geosynthetic clay liner (solving significant geotechnical stability and settlement problems and saving our client $5 million);
- Utilize a much lower than normal waste strength criterion of 7 psi unconfined compressive strength (rather than the agency-preferred 50 psi), allowing the use of a lower cost solidification process, and saving $2 million in waste stabilization costs; and
- Bypass permit requirements and technical guidelines on cover slopes, and use natural slopes of less than 1% (saving our client $1 million in waste grading costs).

Assisted the client in proposing to the agency that a permit requirement to install a 4-foot compacted clay cap be replaced with a vegetative system utilizing phytoremediation and a series of vertical wick drains to enhance drainage of low-weight, impounded sludges. The rationale is based, in part, on an extensive geotechnical investigation of the waste and subsoils that clearly demonstrated the permit-mandated cap would be unstable and eventually fail through slope failure and/or excessive settlement. This “living cap” will promote much higher evapotranspiration than the typical hazardous waste site cap, and would therefore help assure protection of shallow ground water by reducing or eliminating infiltration through the waste. This avoided significant waste handling and leachate recovery costs and saved our client an additional $5 million.

Experience in Action

In-Situ Soil and Groundwater Treatment — PCE, DCE & VC

Proposed area for the treatment of Insitu Chemical Oxidation (ISCO) at the former industrial site which was successfully developed for a hospital facility in the Houston Medical Center.

Former Industrial Facility Chlorinated Hydrocarbon Plume

Soil contamination of chlorinated solvents (PCE, TCE and VC) were detected in soil area. The Primary Chemical of Concern in the Groundwater was Vinyl Chloride.

Soil Cleanup

Initially, a bench scale test was preformed to evaluate the soil and groundwater parameters. Soil Oxidant Demand tests were conducted on soils to optimize the application of Sodium Persulfate while treatability testing was done of the soil to evaluate the application Fenton's Reagent for soil treatment.

A corrective program under the TCEQ VCP was conducted in an area of 1600 SF where high concentrations of PCE were found in the soils. The area was marked in a 5-foot grid pattern where high pressure injection of 20 percent Fenton's Reagent was undertaken in several rounds of treatment. Soils were significantly reduced to levels acceptable for closure under the City MSD program.

Project at a Glance:

Facility:	**Former Industrial Facility Houston, Texas**
Consultant:	**Environmental Consultant Dallas, TX**
State and Local Environmental Agencies:	**TCEQ—Texas City of Houston—MSD Program**

ISCO Soil Treatment Area with flagged injection points for oxidation chemical treatment.

Groundwater Cleanup

At groundwater depth, the soil was found to be sand with clay in the upper 3 feet of the zone. Pore volumes are high, and assumed that a minimum radius of influence from well centers would be 15 ft.

Wells were designed of 1 inch PVC pipe and placed 15 ft bgs to 25 ft bgs in the plume area, where the concentration g of Vinyl Chloride (VC) was targeted for treatment. Injection of the powerful oxidant FMC Klozur activated with a caustic solution was the choice chemical treatment in the groundwater zones. Twenty-five (25) injection wells were located and installed for groundwater treatment.

Experience in Action

In-Situ Soil and Groundwater Treatment — PCE, DCE & VC

Project at a Glance:

Facility:	**Industrial Facility Independence, Louisiana**
Consultant:	**Environmental Consultant Denver, CO**
State Environmental Agency:	**Louisiana—LDEQ**

ISCO injection at under tank farm area, where chemical oxidation of soil was undertaken just below the concrete driveway and Above Ground Tanks.

Industrial Facility -- Chlorinated Hydrocarbon Plume in Soil

Long-term soil and groundwater contamination of chlorinated solvents plagued a facility's redevelopment in Southeastern Louisiana for over two decades. Pump and treat technologies did not achieve required cleanup goals. Ozone Injection/Thermal treatment and In-Situ Chemical Oxidation (ISCO) technologies were evaluated and ISCO was selected totreat the soils in order to rapidly achieve cleanup goals. Subsequently the site was successfully redeveloped.

Soil Cleanup— No Further Action

A corrective action report for soils was submitted to the LDEQ after soils injections were completed. The report requested LDEQ to approve no further action for soils. LDEQ stated in their response letter that, "the soils remedial work has been effective and the remaining constituents in the soil are at levels protective of human health and the environment."

Groundwater Cleanup

- Injection of the powerful oxidant FMC Klosur activated with a caustic solution was the choice chemical treatment in the groundwater zones.
- DCE and vinyl chloride concentrations have been reduced across the site. Shallow and Deep Zones have demonstrated levels of cleanup to closure.
- The highest DCE concentrations are along the plume axis within the intermediate zone where DCE has been reduced from approximately 1,500 to 2,000 ug/l to typically around 300 ug/l or less.
- Vinyl chloride is now rarely reported.

Experience in Action

In-Situ Soil and Groundwater NAPL Treatment — MPG Site

Project at a Glance:

Facility:	**Brownfields/Commercial East Flats , Cleveland, Ohio**
Consultant:	**National Consulting Company Cleveland, Ohio**
State Environmental Agency:	**Ohio—EPA**

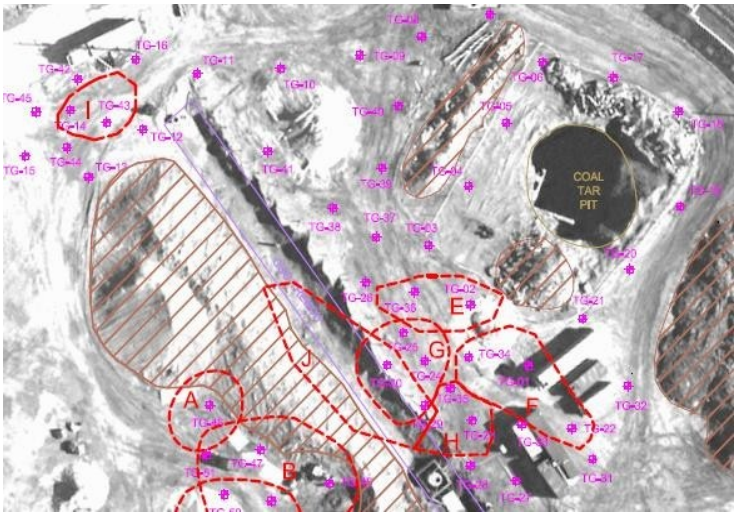
ISCO injection at one of several treatment areas, where chemical oxidation of Soil and GW oxidant injection (FMC Klozur and Hydrogen Peroxide) was undertaken to destroy coal tar NAPL from MPG site

East Flats Development requested remedial action for petroleum non-aqueous phase liquids (NAPLs) in soils at East Flats Site (Site) located in Cleveland, OH. At this site, the MGP NAPL was delineated within multiple affected areas (approximately 24,000 ft). The selected remedy was in-situ chemical oxidation (ISCO) to affect the destruction of the NAPL free product to applicable OHIO standards of less than1 /8 inch of free product and concentrations of petroleum products in the soil to be less than soil saturation levels.

I2M-REARDON developed application rates and inoculant concentrations based on Site data. The ISCO Soil Treatment application consisted of injecting concentrated inoculants on four (4) foot centers in the designated Areas A, B, C and D (7,767 sf). (485 holes, 7,767 sf and 6,500 gallons of Hydrogen Peroxide and Sodium Persulfate).

The ISCO Soil Treatment application in the remaining areas E, F, G, H, J and I consisted of injection to depths of up to 40 ft. on 10 ft centers. 25,900 gallons of ISCO oxidants were injected in the combined area of 11,738 sf.

Analyses of groundwater samples from monitoring wells found no NAPL or free product and concluded with formal site closure of this project.



ISCO (Hydrogen Peroxide and Sodium Persulfate) Chemical Treatment areas of the site.

Experience in Action

In-Situ (ISCO) Soil and Groundwater Treatment — BETX, TPH

Project at a Glance:

Facility:	**Abandoned Petroleum Site North Aurora, Illinois (Chicago)**
Consultant:	**I2M- Houston, TX**
State Environmental Agency:	**Illinois EPA LPST Program**

Phase II supplemental investigation was the first task on site . Several new monitoring wells were installed to complete confirmation and validation of the findings of previous effort.

Petroleum (UST) Site - BETX Plume in Soil and Groundwater

This site has been the subject of community and state environmental litigation for cleanup over the past 20 years, The owners along with IEPA selected I2M-Reardon Environmental to undertake remediation of the site under the state LUST program. Several technologies were considered, however, I2M-Reardon's ISCO approach was selected and executed.

Assessment Program I2M personnel performed a supplemental Investigation for the Gasoline Station to confirm previous investigations. This concluded with the formal acceptance of the Corrective Action Plan (CAP) using ISCO technology as the selected remedy for the remediation by the Illinois EPA. Cleanup targets were agreed by IEPA for Class II groundwater targets according to Illinois TACO levels, i.e. Benzene in soil at 0.17 mg/kg and in groundwater at 0.025.

Site Remediation ISCO technology using activated sodium persulfate (Klozur®) for treatment of impacted soils and groundwater at the site was the selected remedy. Oxidants were placed into the groundwater regime in a designed grid pattern of injection wells spaced on 10ft centers covering the COC plume. As for impacted Soil above the vadose zone, Fenton's Reagent was the selected oxidant.

From 2012 through 2013, 20,000 gallons of 15% sodium persulfate augmented with sodium hydroxide was injected at the site in three rounds. No offsite migration of COCs was determined.

A "No Further Remediation" letter was subsequently issued by the IEPA in 2015.

ISCO Injection of Activated Sodium Persulfate

Experience in Action

In-Situ Soil Treatment — Petroleum Hydrocarbons (BTEX & Benzene)

Project at a Glance:

Facility:	**Petroleum Refinery Bulk Terminal Pasadena, TX**
Owner/Operator:	**Major US Refinery**
State Environmental Program:	**TNRCC—Texas**

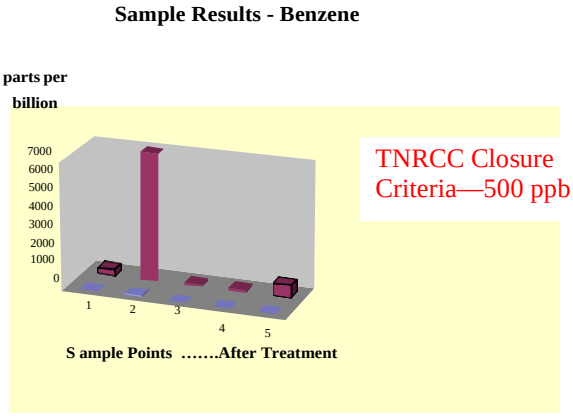
This is the treatment area of a former bulk terminal loading rack facility of a refinery operation in Pasadena, Texas. Most of the facility has been dismantled since ceasing operations in 1996.

Successful Site Closure for Truck Loading Area - Texas Voluntary Cleanup Program (VCP)

Fast, Effective, and Safe Remediation using In-situ Chemical Oxidation was the selected technology of choice.

In 1993, an accident at the refinery truck loading rack caused a gasoline fire. This resulted in the closing of the rack and ceasing operations at the site. Subsequent soil investigations determined that petroleum hydrocarbons were present in the fill material below the loading rack slab.

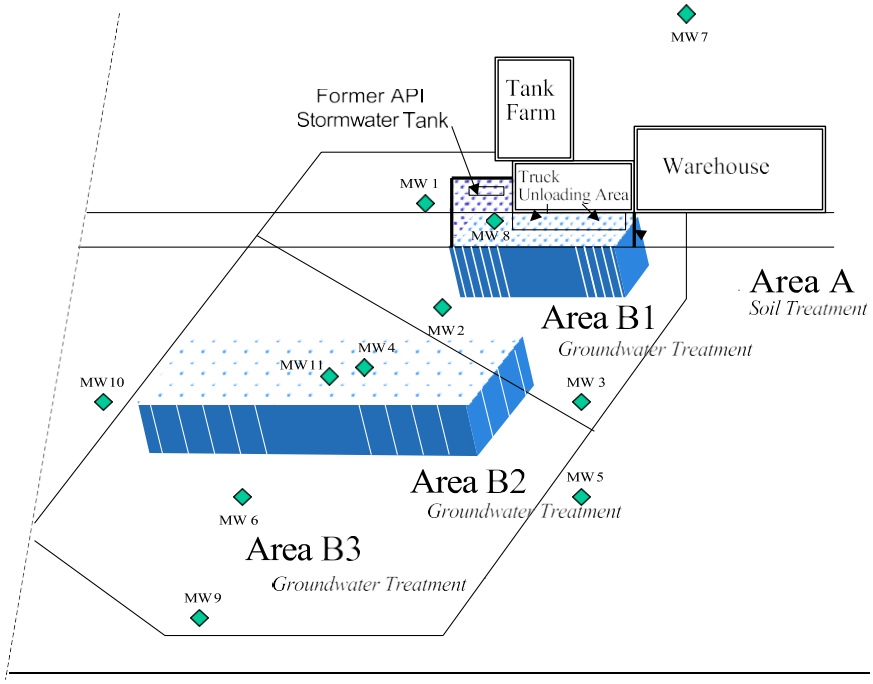
In-situ chemical oxidation using ISCO injection technology was selected as the remediation technology to clean the soils below the slab. Following three injection cycles verification sampling of the soils showed that TPH and Benzene met the reduced levels in accordance with the Remedial Action Work plan approved by the TNRCC.



Under TNRCC Risk Reduction 2 Standards a site closure was obtained for the facility.

Experience in Action

In-Situ Soil and GW Treatment — Chlorinated Hydrocarbons (PCE, TCE)



Project at a Glance:

Facility: Bulk Chemical Blending Longview, Texas

Contamination: 1,1,1 Trychloroethane, Trichloroethylene (TCE), Xylenes, Tetrachloroethene (PCE)

Geology: Sandy Clay in upper 15 ft. Sands and some gravel in lower 10 ft.

Results: Significant reduction in 8 weeks, TCE controlled to drinking stands for over 2 years.

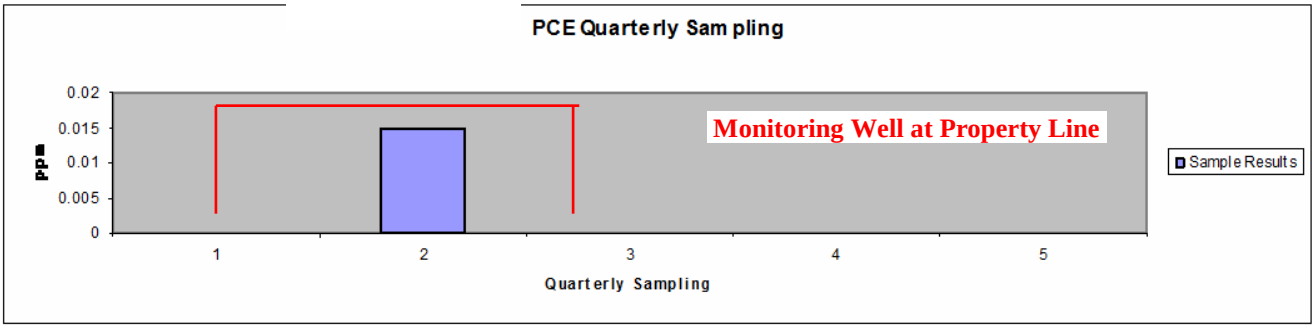
This layout depicts the treatment areas as follows: Area A comprised two (2) source areas where both soil and groundwater treatment was accomplished. Areas B where segmented for managed treatment of groundwater only.

Cleanup levels were achieved in 12 weeks

Site is soon to be closed under the Texas Voluntary Cleanup Program

PCE Treatment Area

Injection Treatment



The Project was based on a multiple phased approach where the soil was treated in two source areas near the warehouse, sump, and tank farm. Groundwater was treated in the following three phases to the property limits of the facility. Over 80,000 lbs. of Peroxide was earmarked for the project.

Experience in Action

In-Situ Soil and Groundwater Treatment — TPH, Diesel Range

Project at a Glance:

Facility:	**Active BNSF Rail Yard Oklahoma City , Oklahoma**
Consultant:	**Regional Consulting Firm, Tulsa, Oklahoma**
State Environmental Agency:	**Oklahoma Department of Environmental Quality**

Ongoing ISCO treatment of BNSF Rail Yard in Oklahoma City. I2M Technician is applying Chemical Oxidation treatment in soil and groundwater between and below the tracks of a former fuel loading facility.

Fast and Under Budget - Three week cleanup met all soil and groundwater targets for a diesel-contaminated site.

Mobile system and crew were deployed and on site applying chemical oxidation in the first few days of the project.

Over a period of several years, General Motors loaded rail cars with vehicles at the BNSF Rail Yard at Oklahoma City, Oklahoma. Train engines were refueled at a site between the tracks. The Facility was decommissioned. All equipment and structures were removed including concrete surface slabs.

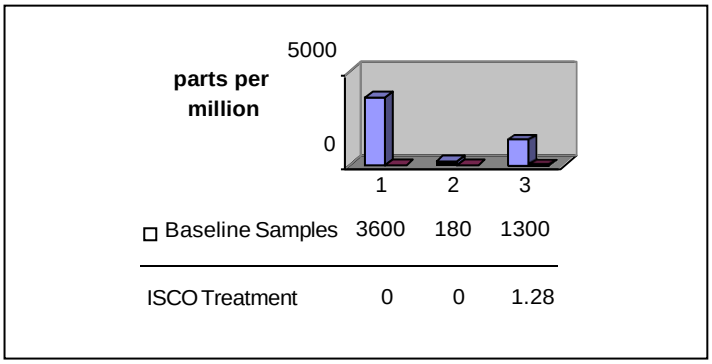
Backfill was placed in excavated areas, however, BNSF would not allow the excavation below 3 feet in the track area fearing track foundation integrity. Since soil in track area was contaminated at depths below 3 feet, *In situ Chemical Oxidation* was chosen as the technology of choice for the cleanup.

I2M Activities:

Applied a sequential injection of hydrogen peroxide and catalysts to create a Fenton's reaction in the soil and groundwater between the track and below the tracks.

Soil and Groundwater samples all met project targets. Project is being completed in the first quarter of 2003.

Soil Analytical Results



I2M Associates, LLC

Experience in Action - Industrial Facility

In-Situ Soil and Groundwater Treatment — TCE & Vinyl Chloride (VC)

Project at a Glance:

Facility:	**Redeveloped Industrial Site Goodland, Indiana**
Consultant:	**National Consulting Firm, Nashville, TN**
State Environmental Agency:	**Indiana Department of Environmental Quality**

ISCO treatment of Driveway at a former portion of Industrial Site in Indiana.I2M-Reardon Technician is applying Chemical Oxidation treatment in soil and groundwater below the driveway area of a former industrial facility.

Fast and Under Budget - Three week cleanup met all soil and groundwater targets for Closure under Indiana VCP. The first to treat with Fenton's Reagent to Activate Sodium Persulfate.

Soil Cleanup — I2M treated soil from near surface to a nominal depth of 6 to 12 feet in the contaminated area.

Groundwater Cleanup — I2M-Reardon treated groundwater from treated soil depths of 8 feet to a depth 15 feet (nominal) in the contaminated area.

TCE was encountered after and assessment and investigation of the property. It was the apparent result of a former electronic manufacturing process. Since soil and groundwater was localized under newly paved area *In situ Chemical Oxidation* was chosen as the technology of choice for the cleanup.

I2M personnel applied a sequential injection of hydrogen peroxide and catalysts mixed with Sodium Persulfate to create a Fenton's reaction in the soil and groundwater and simultaneously activate the Persulfate to achieve a combination of OH and SO4 radicals producing a powerful TCE destruction combination.

Performance Criteria—*Closure Achieved*

ISCO treatment performance will be based on Soil samples collected at 6 - 10 feet in the affected areas. Soil Target Criteria is based on Indiana Subsurface Soil Cleanup Goal (Tier II) of TCE to 25,730 ug/kg.

Groundwater samples collected in the treatment area from a depth of between 10 to 16 feet in the treatment area. These samples will be collected and analyzed form the existing Monitoring Wells located at the site.

I2M References

References:

Projects:

Weyerhaeuser/DuPont Chemical Plant Site Redevelopment, 880 acres, DuPont, Washington, United States and Superlon Plastics/DuPont Herbicide-Pesticide Clean-Up, 120 acres, Tacoma, Washington, United States

1. Mr. Jeff King (I2M Founder)
CEO, Pacific Environmental Remediation Corporation (PERC)
Seattle (Snohomish), Washington, 98290
425-238-2212
jking@perc-nw.com
jdKingwa@gmail.com
Formerly DuPont Remediation Manager

Aidex Pesticide Chemical Plant Redevelopment, 60 Acres, Council Bluffs, Iowa

2. Mr. Doug Diehl
Email: DSDiehl@edge-es.com

Hardage Industrial Waste Disposal Plant, 600 acres, Criner, Oklahoma

3. Mr. James C. Morriss
4. Ms. Elizabeth A. Webb
Thompson & Knight LLP
98 San Jacinto Boulevard Suite 1900
Austin, TX 78701
512.469.6100
James.Morriss@tklaw.com
Elizabeth.Webb@tklaw.com

Precision National Site (Superfund), 46 Acres, Clarks Summit, Pennsylvania

5. Mr. Larry Brunt, P.E.
Arcadis - LFR, Inc.
35 Columbia Road
Branchburg, NJ 0887
LBrunt@arcadis-us.com
908-526-1000

Phase 1 (Brownfield) Flats East Development, 20 Acres, Cleveland, Ohio

6. Mr. Harlan Cohen
Harlan and Associates, Inc. (for Flats East Development)
30699 Stencrest Dr., Orange Village, OH 44022
Email: harlan@siteconsult.com
(440) 498-9559

DuPont, U.S. and International - Sites Vary in Size 50 to over 3,500 Acres including for example:

Ashley River Industrial Park Redevelopment District, 3,500 Acres, Charleston, South Carolina, United States

7. Mr. Raymond Schaefer
Formerly Business Manager, DuPont Remediation Programs
1819 Mountain Aspen Ln
Kingwood, TX 77345
Ray.Schaefer@me.com
(713) 254-6636

I2M Mission and
Professional Services Offered
in
Brownfields and Re-Development

and others Services

I2M Mission Statement

Given the nature of the world and priorities of our governments and industries today, our success will be measured in terms of effective clean water and efficient use of energy. To address these priorities our Mission is to be the preferred supplier of strategic environmental and energy services critical to the success of our clients' business. I2M will provide economically driven services specifically designed to optimize our clients' compliance programs and minimize or eliminate environmental liability.

Additional I2M projects have also been summarized on the I2M corporate website (more).

Company Overview

I2M is an environmental company that provides services to Fortune 500 Companies, many in the petroleum, petrochemical and chemical markets. The original remediation company (Reardon) was founded in March, 2001, was purchased in 2016, and has it's corporate office in the Kirby District near downtown Houston, Texas, with additional offices nearby that address investigations and remediation, with the Waller Field office located a few miles northwest of Houston. The I2M Environmental Group of Senior Personnel is presented in the I2M Corporate website (here).

I2M specializes in environmental consulting, remediation, and *development of environmental technologies*. Consulting services range from compliance and site characterization to corrective action, closure, land redevelopment, and strategic environmental management programs. I2M remediation services include corrective measures evaluation, encapsulation, landfilling, removal, soil vapor extraction, bioremediation, solidification and stabilization of wastes and contaminated soils and groundwater.

The original company has experienced continuous growth in sales, service sectors, and clients since its inception. Reardon's original client list have grown from ARCO Chemical Company to the following representative list companies:

- Pan Energy (Pipelines and Bulk Terminals)
- BJ Services Company (Oil Field Services Company)
- Crown Central Petroleum Company (Refining, Marketing and Petrochemicals)
- Farmland Industries (Petroleum Refining)
- Lyondell Petrochemical Company (Refining, Petrochemicals, and Chemicals)
- ATC Environmental Consultants (Louisiana LUST program-multiple sites)
- Valero (Refining)
- Pilot Chemical Company (Petrochemicals and Chemicals)
- Dixie Chemical (Chemical Spills)
- Kinder Morgan (Pipeline Facilities)
- Conoco (Retail Operations)
- Stewart Stevenson (Military)
- EPA Brownfields (Fort Worth Site)
- Beazer (Wood Treatment Facility)

- Multiple Dry Cleaner Facilities
- General Motors/BSNF (Car Loading Facility)
- Precision National Plating (Superfund)
- East Flats (Brownfields, Cleveland)
- University of Texas (Chemical facility)
- Waterbury Companies (Industrial Sites)
- URS Corp (Arsenic Site)
- URS Corp (Chevron Pipeline)
- Morgan Companies (Property Assessment and Cleanup)
- Malek Estate (IEPA LUST site closure)
- Terracon (LUST and Pesticide sites)
- Mesquite Car Wash (URS)
- Dry Cleaner (Farmers Branch, TX)
- Comet Cleaners (Half Associates, Bedford)
- Sugarland (Brown And Caldwell)

For additional Clients of I2M, see (more).

I2M provides a complete package of services including those of the original remediation company (Reardon) that can be tailored to customer needs from initial scoping of alternative solutions through implementation, financing, and end-use. Onsite remediation and construction services are enhanced through alliance agreements with national and international corporations. For the range of I2M services, see the corporate website (here).

I2M Associates, LLC was formed in 2010 and has had clients ranging from attorney groups and small to mid-size oil and gas groups and other companies to Fortune 500 companies, located within the U.S. and in Australia and the UK, see (more).

Previous I2M clients have been listed on the I2M corporate website (more).

Professional Services Offered

Site Characterization

- In-situ and ex-situ soil and groundwater testing
- Physical and chemical characterization of surface water, groundwater, soil and air
- Process waste water and storm water segregation studies
- Waste water treatment upgrade studies
- RI, UST, RFI, and industrial site investigations
- Facility waste analysis and waste minimization

Strategic Environmental Management

- Strategic environmental management programs
- Multi-media and ISO 14000 programs
- Environmental permitting and compliance programs

Corrective Action

- Interim measures implementation
- Corrective measures technology evaluation and assessment
- Land use (risk reduction)
- Encapsulation and containment
- Disposal/landfilling, recovery and removal

In-Situ and Ex-Situ Technologies, Chemical Oxidation via Patented ISCO System

- Volume reduction (soil vapor extraction)
- Toxicity reduction (bioremediation)
- Mobility reduction (solidification and stabilization)
- Conceptual designs
- Operation and maintenance planning
- Construction work plans and final plans
- Remedial Construction Services
- Waste water treatment systems
- Remediation and waste minimization systems

For additional information on I2M services provided, see (more).

I2M key personnel and founders qualifications and expertise are discussed in the following major project summaries:

CHEMICAL INDUSTRY

Soil Remediation

Major Clients: Example DuPont (Others confidential)

Chemical Manufacturing Plant – near Morriston, NC

- **Situation:** This approximately 60-acre chemical site was comprised of four (4) units. DuPont was named as a responsible party subject to pay $160,000,000 to investigate and clean up the property in accordance with the Comprehensive Environmental Response Compensation and Liability Act (CERCLA).

- **Solution:** During 1992, Mr. Schaefer (DuPont) hired one of I2M-Reardon's Principals, Mr. Richard Bost, P.E., P.G., and his team, to investigate the source and operation of this property with the intent of identifying the operating history, extent of soil contamination and identify remediation measures acceptable by the USEPA for remediation and revitalization reuse.

- **Results:** Mr. Bost and team were more than successful in this project as the team's work structured suitable evidence, as presented in Court Testimony, to: 1) absolve DuPont from all financial responsibility in this matter, 2) lay foundation for a

secondary manufacturing operation to start which continues to operate today.

Lake Charles Chemical Complex – Lake Charles, LA

- **Situation:** This approximately 120-acre chemical plant had contaminated soil with various small and large spills while manufacturing and shipping ethylene. Soil contamination by both organic and metals, was identified both within the manufacturing property and also in the slips at the barge loading facility. A new owner who purchased and operated the plant for a few years managed the manufacturing and barge loading operations. Within the purchase and transfer agreement, DuPont was responsible for paying an increasing amount of money toward soil cleanup costs spent by the new owner.

- **Solution:** During 1994, Mr. Schaefer (DuPont) hired I2M personnel, and his team to investigate the operating conditions of the chemical manufacturing operations. The team applied a unique investigative technique that corroborated traditional investigation approaches to identify non-standard operating conditions.

- **Results:** The I2M team provided important metrics and findings to: 1) show [then] present-day operating practices were the cause of much of the contamination, 2) enable re-negotiation of the Operating Agreements between the two companies, saving DuPont several millions of dollars in operating expenses for these facilities.

Bailey Chemical Waste Pits – Bridge City, TX

- **Situation:** This approximately 280-acre chemical waste disposal site operated from about 1961 through 1971 creating general environmental contamination including soil and surrounding tidal marsh. The contamination created exposure of organic chemicals and metals to local fish populations and consequently to the general public who used the area as a recreational fishing location. The landfill was a designated CERCLA site. The contractor-led investigation / remediation team was failing in their cleanup work by running up the budget and schedule for completion and creating threats of court-action by USEPA. This entity also was threatening their own lawsuit against the industry leadership, creating further disruption to the clean-up progress.

- **Solution:** During 1993, Mr. Schaefer (DuPont) hired the I2M-Reardon team to take a second-look at the contractor's approach and suggest alternative actions to overcome the difficulties claimed by the contractor.

- **Results:** The I2M-Reardon team provided timely and necessary insight to the contractor and the industry steering committee allowing progress on the project. The site remediation was completed and now revitalized site was created into a protected wetland suitable for wildlife and recreational activities.

Agrico Chemical Co. – Pensacola, FL

- **Situation:** This approximately 35-acre chemical manufacturing site operated for over 90 years contaminating soil and the surrounding environment with heavy metals and organic compounds. The contamination was feared to reach the nearby residential population thus making this a CERCLA cleanup site.

- **Solution:** During 1993, Mr. Schaefer (DuPont) hired the I2M team to investigate the soils beneath the long-closed chemical manufacturing operations and devise a cleanup and revitalization plan.

- **Results:** I2M team identified and implemented soil cleanup measures including partial soil removal and on-site stabilization, completing their work in 1997. The protective measures remain intact today and enable safe use of the property for solar energy production, warehouse and/or recreational.

DuPont, Washington - $150MM Ordinance Plant Superfund Project:

- **Situation:** Provided project management and engineering support (by I2M Founder, Jeff King) to the 880-acre DuPont /Weyhauser Site. The Project included cleanup of a 70-year-old decommissioned plant, which produced explosives for military operations during the early 1900s.

- **Solution:** The project consisted of drum removal, soil washing and removal of lead-contaminated soils, and with the use of several disposal technologies.

- **Results:** Mr. King provided project oversight of the construction of a world-class golf course on sections of the large property, which included subsequent construction of high-end housing surrounding the golf course.

Tacoma, Washington - $90MM Herbicide-Pesticide Formulation Plant Superfund Project (Arsenic and Lead):

- **Situation:** Provided project management (by I2M Founder, Jeff King, CEO of Pacific Environmental Remediation Corporation (PERC) via RI-FS preparation and approval by State for removal of soils below existing office buildings and associated shallow materials at the 160-acre DuPont/Superlon Plastics State Superfund Site in Tacoma, Washington.

- **Solution:** The project consisted of removal previous plant debris, soil washing (and soil replacement) of arsenic and lead contaminated soils, underlying sediments, and shallow groundwater, with installation and quarterly sampling of numerous monitoring wells and 24/7 monitoring of the pressure distribution within the shallow and intermediate aquifers to determine flow direction and rate of migration of the contaminant plume, the former being subject to significant

subsurface diurnal influences created by the Puget Sound tidal fluctuations nearby. Soil characterization and groundwater investigations were conducted by and under the supervision of I2M's Chief Hydrogeologist, Michael D. Campbell, P.G., P.H., former Regional Technical Manager (Central U.S.) of DuPont's Environmental Remediation Services (DERS, based in Houston, Texas during the 1990s.

- **Results:** Almost all of the contaminated soil and buildings have been removed. The final solution for groundwater remediation has not yet been selected or proposed.

OTHER CHEMICAL INDUSTRIAL SITE PROJECT EXAMPLES:

Independence, LA – $1.2 MM (Industrial - DNAPLs):

- **Situation:** Long-term soil and groundwater contamination of chlorinated solvents plagued a facility in Southeastern Louisiana for over two decades. Pump and treat technologies did not achieve required cleanup goals.

- **Solution:** Ozone Injection/Thermal treatment and In-Situ Chemical Oxidation (ISCO) technologies were evaluated and ISCO was selected to bring the facility to a clean state allowing redevelopment. A corrective action report for soils was submitted to the LDEQ after soils injections were completed. The report requested LDEQ to approve no further action for soils.

- **Results:** LDEQ stated in their response letter that, *"the soils remedial work has been effective and the remaining constituents in the soil are at levels protective of human health and the environment."* Injection of the powerful oxidant FMC Klosur activated with a caustic solution was the appropriate choice chemical treatment in the groundwater zones.

Bryan, TX - $100M (Industrial - Arsenic):

- **Situation:** Based on previous bench-scale tests of potential injectates at other sites, an injection of amorphous hydrous ferric oxide (HFe_3O) was the recommended treatment approach for the higher arsenic concentrations in groundwater in the affected area.

- **Solution:** This was an onsite pilot-scale test conducted in the Merged Upper/Middle Aquifer over a 30-ft diameter area centered southeast of an existing extraction well. Prior to injection, the HFe_3O suspension was prepared.

- **Results:** For the entire area the injection was estimated at 16 tons of $FeCl_3$ and 16 tons of sodium hydroxide (NaOH) mixed into 15,000 gallons of water, then injected into 9 injection points.

Lufkin, TX – $400M (Pipeline – BETX and MTBE):

Situation: I2M-Reardon undertook in-situ remediation of soil and groundwater at an East Texas Site. The objective of the project was to use I2M-Reardon's technology for the enhanced in-situ destruction of Gasoline Range Organics – BETX and MTBE in soil and groundwater found at several areas at the site.

Solution: Soil was treated to a nominal depth of seven (7) feet in the contaminated area with an effective oxidant of 20 percent Hydrogen Peroxide on a gridded injection layout.

Results: BETX Targets were met. Groundwater was treated with a combination of hydrogen peroxide and sodium persulfate for the reduction of MTBE organics.

Other Projects

National - Corporate Remediation Program (DuPont):

Provided consulting services for the development of a $10 billion Strategic Remediation Program for a "Fortune 10" chemical manufacturing company.

Moundsville, WV - $20M RCRA Closures:

Performed clean closure certification of a surface impoundment and a waste toluene di-isocyanate storage facility for a major chemical manufacture. Services included verification sampling and independent engineering certification.

Mobile, AL - $60M RCRA Corrective Action:

A Structural Integrity Test and Assessment was conducted to determine if 14 sumps, basins, and tanks have had releases to the environment which would trigger RCRA Corrective Action. The results were used to negotiate with the state agency that no releases have occurred above risk base action levels, and that RCRA Corrective would not be required for the SWMU's.

Kinston, NC - $85M Remedial Alternatives for RCRA Corrective Action:

Remedial alternatives were evaluated for containment of a TCE plume that underlies a major chemical manufacturing facility. Plume containment and aquifer remediation was critical for the protection of a major water supply aquifer in the Kinston Area. Three groundwater containment alternatives and four water treatment systems were evaluated for effectiveness and cost. A Slurry wall containment and pump and treatment system was selected as remedial alternative.

Orange, TX - $600M RCRA RFI, CMS, and CMI:

This project included an RFI assessment, CMS Study, and CMI remediation of buried waste caused by releases from a chemical plant waste water treatment system. A diversion ditch system was constructed to maintain plant operations during remediation activities. An RFI was conducted to determine the extent of buried waste and soil contamination. The CMI consisted of excavation, solidification, and disposal of hazardous waste. Final closure was successfully negotiated with the TNRCC.

Victoria, TX - $400M Groundwater Remediation (BETX and Chlorides):

A DERS remediation project was implemented for a major chemical manufacturing plant. A pump- and-treat system was designed and constructed to contain groundwater plume of benzene and chloride. The capture zone design was based on a 400 gpm groundwater flow rate containing 280 ppb benzene and 8,400 ppm chloride from a seven-point well-collection system. The treatment system included an air stripper, low temperature heater, and carbon polishing units.

Martinsville, VA - $400MM Solid Waste Landfill Closure:

DERS prepared the Final Closure Plan for an Industrial Ash Landfill at a major chemical manufacturing plant. The project included the amendment of previous closure plans, the development of the final bid documents, health and safety plans, a Construction Quality Assurance Plan, and construction of a final cap. Closure certification was prepared and executed.

INDUSTRIAL SITES WITH HAZARDOUS WASTES DESIGNATED FOR REDEVELOPMENT AS "BROWNFIELDS"

Cleveland, OH - $300M Brownfields Project (DNAPLs):

East Flats Development requested remedial action for petroleum non-aqueous phase liquids (NAPLs) in groundwater at East Flats Site (Site), located in Cleveland, OH. At this site the manufactured gas product (MGP) NAPL was delineated within multiple affected areas (approximately 24,000 ft.).

The selected remedy was in situ chemical oxidation (ISCO) to affect the destruction of the NAPL free product to applicable OHIO standards of less than 1/8 inch of free product and concentrations of petroleum products in the soil to be less than soil saturation levels. Site closure was obtained.

Houston, Texas / University Of Texas (Former Industrial Facility: PCEs and VC):

A corrective program under the Texas Commission of Environmental Quality (TCEQ) Volunteer Cleanup Program (VCP) was conducted in an area of 1600 SF where high concentrations of PCE were found in the soils and underlying sediments. The area was marked in a grid pattern where high pressure injection of 20 percent Fenton's Reagent was injected in several rounds of treatment. Soils zone were significantly reduced to levels acceptable for closure under the City MSD program. In the groundwater phase, wells were designed of PVC pipe and placed to a depth of 25 ft. bgs in the plume area, where the concentration of Vinyl Chloride (VC) was targeted for treatment. Injection of the powerful oxidant FMC Klozur -activated with a caustic solution was the choice chemical treatment in the groundwater zones. Twenty-five (25) injection wells were located and installed for groundwater treatment.

Fort Worth, Texas, School and Training Facility (Brownfields):

During a holiday period, the School approved In-situ (ISCO) Remediation using a modified Fenton's Reagent technique to address Chloroform concentrations in soil. next to the school building. Soil targets were to be reduced to below Tier 1 standards, 26 –42 mg/kg in all soil areas. Furthermore, the objective of this plan was to achieve a remedy for the site to prevent chemicals of concern (COC's) in the soil from leaching into the groundwater. Soils tested in the targeted areas showed results of 2.07 to 4.24 mg/kg after injection treatment.

ABANDONED INDUSTRIAL SITES IDENTIFIED BY US FEDERAL GOVERNMENT FOR REMEDIATION USING THE NATIONAL SUPER (WASTE) FUND

Clarks Summit, PA - Precision National Site (Superfund: Chromium^{+6}):

The 46-acre Precision National Plating Site is located in Clarks Summit, Pennsylvania. The site began operation as a chromium electroplating facility for locomotive crankshafts in 1956 and continued this operation until 1999 when it was closed. Using USEPA guidance, Precision National then calculated a soil cleanup level of 60 mg/Kg of hexavalent chromium in soil in order to meet the 11 ug/L hexavalent chromium standard for waters tested in the creek. This soil cleanup level was approved by USEPA and the soil injection of 250,000 gallons of 3 to 6% concentration of Calcium Polysulfide was injected under the I2M-Reardon designs, methods and techniques. Successful testing of soils in all areas met or exceeded the target criteria.

Pensacola, FL - $15MM Agrico Superfund Action (Fluoride and Sulfate):

Final Design Plans and Specifications for a ROD were negotiated with EPA Region IV. The Remedial Action Plan consisted of construction activities, Project Management Plan, Community Relations, Quality Assurance, and Health and Safety Plans. A valued engineering analysis was incorporated into the Construction Remedial Action Plan. This

analysis was used to save over $70MM from the original ROD estimate.

PETROLEUM REFINING AND MARKETING INDUSTRY

Soil and Ground Water Remediation

Port Arthur, TX - $80M (VOCs):

Conducted an in-situ bioremediation study to treat oily sludge in ponds. The results of the study showed that bioremediation could successfully reduce the VOC levels in the sludge to below the TNRCC non-hazardous Class II waste designation for final disposition.

Ponca City, OK - $900M/yr. Soils Remediation Program (BETX):

Developed a soils utilization program for a fuels refinery plant. The program consisted of an innovative field sampling and analytical technique for identifying contaminated soil, hazardous waste soil, and non- contaminated soil. Remediation technologies included bioremediation and vapor phase extraction for organic contaminated soils and stabilization for soil contaminated with metals. The soils program treated the contaminated soil for reuse in the plant. This program was designed to treat in excess of 50,000 Tons of soil per year, and save the plant over $2 million per year in annual operating costs.

DE, FL, GA, MD, MI, NC, OH, OK, PA, SC, TN, TX, VA, WV - UST and Related Projects:

I2M-Reardon personnel conducted numerous environmental site assessments for major oil companies marketing groups. Evaluated marketing stations environmental liability for acquisitions and divestitures. Served as principal investigator for product releases from petroleum and chemical USTs. Conducted hydrogeologic investigations, aquifer testing (and flow-net analysis), contaminant plume attenuation (retardation) analysis.

Managed petroleum and chemical tank removal, decontamination, and demolition. Conducted in-situ and ex-situ soil remediation using vapor phase extraction, bioremediation, neutralization, and stabilization technologies. Designed and constructed groundwater remediation systems using containment, in-situ bioremediation, and ex-situ carbon filtration technologies.

Birmingham, AL - $4MM Aluminum Recovery Process:

I2M-Reardon personnel engineered plant layout design for a heavy media aluminum recovery process. The project included specific design and specifications for water-clarification systems, plant process design, and plant equipment.

MAJOR ORDINANCE DEMOLITION PROJECTS

Louviers, Colorado - $5MM (Picric Acid – Excitable Materials) Plant Remediation:

Provided engineering and construction services to DuPont in the decommissioning of a manufacturing chemical plant for blasting caps. The project included the destruction of over 60,000 explosive charges and bioremediation of explosive residues that lined the bottom of several settlement ponds and basins.

Bridgeport, CT - $100M RFI Work Plan (Excitable Materials):

RFI work plan for the demolition of DuPont/Remington Arm's Facility. This included an investigation program for discovering, decommissioning, and remediation of all types of military ammunition, which was manufactured from 1900 to 1975 at Remington's 100-year-old manufacturing facility. The work also included a RCRA Closure Plan for a hazardous waste settling pond.

MINING AND METALS INDUSTRIES

GOLD MINING REMEDIATION PROJECTS

Tasmania, Australia, Large Tailings Lake Contains Significant Gold and Silver: I2M provided independent assessment of mine tailings from a large base- and precious metal mine to remediate some 10 million tonnes of waste after zinc and lead were removed by multi-stage processing. The waste consists of 70% sulfide minerals (of pyrite, arsenopyrite, sphalerite galena, chalcopyrite, and tetrahedrite), all of which would oxidize to form acidic mine drainage if allowed to sit in piles open to the atmosphere and oxidizing rainfall. To minimize oxidation, waste is currently being stored below a large engineered lake. Subsequent analysis by I2M personnel, sampling laboratory results showed that significant concentrations of gold (550,000 oz) and silver (20 million oz) are available within the minerals in the submerged waste tailings.

I2M made recommendations based economic modeling for removal and transportation with offsite recovery of the precious metal. After the waste tailings are removed offsite, and lake-water chemistry adjusted, the lake can be drained and the water released to the original stream without environment damage returning the area for multiple use. By physically removing the tailings by dredging while covered by the lake water, this eliminates potential damage from potential acid mine drainage and potential release of iron sulfate, arsenic and lead to an especially sensitive wildlife area of central Tasmania, Australia.

Vietnam, Đồi Bù District, Hòa Bình Region SW of Hanoi - $125M – Independent Evaluation of Gold and Silver Mines and Processing Plant: I2M conducted onsite independent investigations of small operational gold and silver mines consisting of sampling ore working face via adits extending some 2,500 feet for the purpose of

determining if the ore deposits being produced in the two mines visited could support expanded production. And, if the sulfide processing plant, located some 25 miles down from the mine and adjacent to a valley. The processing plant consisted of the primary of crusher, floatation, and cyanide recovery, and final filtration recovery. I2M determined that the tailing pond that received waste from the final filtration circuit had been breached, emptying into an adjacent stream (dry season). Both tailing sediments and stream sediments were sampled and the sediments were found to contain very high arsenic, lead, and cadmium. I2M personnel recommended that a comprehensive follow-up investigation be conducted by the local government for taking samples of the stream water (when not dry), associated sediments downstream, adjacent shallow rural water wells and in the area where the subject stream enters the rice paddies in the valley below for the purpose of assessing environmental concerns.

Eureka County, Nevada - $6MM Open-Pit Mining and Gold-Silver Heap Leach Recovery: I2M personnel purchased a property from a major mining company for a consortium of Norwegian-Italian-Swiss investor groups. and served as mine management, After conducting extensive drilling and coring, designed mine plan, designed and constructed 9-mile haul road from mine to pads, the decision was made by the consortium to initiate mining. The new leaky-pipe cyanide leach system, and existing electrolytic recovery and smelting systems to recover precious metal dore were upgraded. I2M personnel managed day-to-day mining, heap-leaching operations, provided oversight of dore production and senior I2M personnel transported dore to refinery in Salt Lake City, Utah. I2M also conducted environmental monitoring of groundwater in plant area, and initiated and implemented a comprehensive safety program. I2M personnel also provided liaison with state and federal regulatory agencies.

MAGNETITE MINE PERMITTING

Queensland, Australia - $225M Magnetite Mine Development License Application Preparation: I2M Associates, LLC was selected by an Australian mining company to prepare an MDL application to be submitted to the Queensland government in preparation for mining. I2M personnel were relocated to Townsville, Qld. to coordinate and assemble the permit application. The process required 8 months in-country meeting with governmental regulatory agencies, researching requirements, and assembling geological, environmental, and mining data for assessment and description.

URANIUM MINING AND WASTE PROCESSING

Brooks County, Texas - $200M In-Situ Uranium Solution Mining and Processing: I2M Associates, LL was engaged to conduct a comprehensive independent evaluation of the uranium production system in operation for the purpose of preparing a NI 43-101 report for the client and the Vancouver Stock Exchange and other exchanges. This investigation included a review of the uranium resource drilling and logging data used by mining company to characterize the uranium roll-front orebodies in the primary and secondary zones, and of the consumption rates by processing plant chemical systems, wastewater injection well condition and history, combined with a review of state and federal permits

and associated filings and reports. Conducted comprehensive economic modeling of ore grade, market price, and multi-case sensitivity to potential changes in project-price conditions.

COAL MINING AND OPERATION EVALUATIONS

Wayne County, Utah - $90MM Coal Mine and Loading Facility (Green River, Utah): I2M personnel conducted independent assessment in due diligence for funding agencies of the subbituminous coal resources present in the shallow subsurface amenable for open-pit mining involving drilling, coring, geophysical logging, mapping of faulted coal beds. Completed calculations of pit-recoverable reserves available for transportation 70 miles by road to a new 25,000 ton stockpile for transferring at a railroad facility with automatic loading for transportation to coal-fired power plants near Las Vegas. I2M personnel determined that coal reserves were approximately 25% of that estimated by project consultants and approved by associated banks funding the fast-tracked project.

Monroe County, Louisiana – $200M Investigation to Address Lignite Beds Disruption During Mining Resulting from Excess Pore Pressure: I2M personnel were engaged to conduct a comprehensive groundwater flow-net analysis of the future mining blocks to determine areas of excess pore pressure causing lignite bed movement as overburden was removed in advance of bucket-wheel mining of lignite. This activity was conducted for the purpose of minimizing mining of underclay that would decrease lignite quality by increasing “ash” levels to the coal stream sent by conveyor to the mine-mouth power plant nearby. 250 groundwater monitoring wells were drilled and installed with designed screen lengths, and logged (both to record lithology and by geophysical logging of gamma, SP and resistivity). Top of well casings were surveyed for elevations and “slab” section flow-net maps and surface elevation maps of anomalous areas were constructed and keyed to master mining maps for future reference by the operator.

Results identified mining areas of high-, medium-, and low-pore pressure that were directly related to permeability differences present within the underclay and its thickness. Small-diameter pore-pressure relief wells were installed throughout the areas mapped as exhibiting high-pore pressure. Within 6 months, the local monitoring of pore-pressure (water levels) in wells indicated a marked decrease in pore pressure. Three years later, mine management indicated to I2M that the lignite-bed movement after removal of overburden had be reduced to near stability, as planned, and that they were moving high-quality lignite to the power plant by conveyor now after passing the anomalous subsurface areas of the mine.

GYPSUM MINE OPERATIONS UPGRADE:

New Braunfelds, TX - $40MM Gypsum Plant Upgrade: Project Engineering for an expansion of existing mining and lime processing facilities. The project included the installation of a new kiln and other rotating equipment. Project responsibilities included

vendor procurement, equipment selection, project engineering and final design of plant facilities, and environmental safety specifications.

BAUXITE MINING REMEDIATION

Saline County, Arkansas - $325M Remediation Plans at Abandoned Bauxite Mine: A major aluminum manufacturer was undertaking a cleanup and redevelopment of a site in central Arkansas, considered one of the nation's largest deposit of bauxite ore that was mined for aluminum production. The site scarred the landscape with strip mining tailings mounds and acidic lakes from acid mine runoff (AMR) occurred over a very large regional area. To complicate the matters, the runoff from the lakes into the area surface water system had to be addressed. A program was developed at the request of the corporation to remediate the acidic water to provide for the redevelopment of the area for residential land use. A phyto-remediation program was proposed and contracted to the corporation in Pittsburgh to effectively control and neutralize the acidity of the water while stabilizing the soil to control soil erosion in the runoff.

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An Expansion of I2M

- I2M Associates, LLC Expands with New President
- New I2M Mission with Outstanding Management Team
- New Acquisitions in Environmental and Natural Resources Industry

❖ I2M Associates, LLC Expands with New President

Richard C. Bost, P.E., P.G. is elected President and CEO as Founding President, Jeffry D. King, P.G., retires (more).

- Mr. Bost joined I2M as a Senior Engineering Associate in late 2011 after retiring as Senior Partner and Officer of Environmental Resources Management (ERM).
- He played a significant role in ERM's expansion internationally over more than 25 years, becoming the world's largest privately held environmental consultancy.
- He is well known in the environmental and geotechnical engineering industries in the U.S. as a “rain maker”.
- He is a well-known expert witness in the environmental field for both industry defense and righteous plaintiff cases (more).
- He served as a Primary Lecturer - 4-month IET training program during 1990s (more).

❖ New I2M Mission with Outstanding Management Team

Michael D. Campbell, P.G., P.G. serves as EVP and Chief Geologist / Chief Hydrogeologist (more).

- Mr. Campbell is a well-known geoscientist and technical manager in U.S. and overseas (more), and a seasoned expert witness and litigation consultant.
- He served in senior technical management of small and large industry groups since the early 1970's, e.g., President and Senior Partner in C,F & B, a mining and environmental consultants (more), Corporate Consultant (Chief Hydrogeologist) for Law Engineering throughout U.S. (more), ENSR Consulting and Engineering, Inc., and as Central Regional Technical Manager of DuPont's environmental group (DERS), and for special assignments for ERM (for Bost) and for mining clients in Australia and London.
- He has worked with management teams with common roots in Houston's professional circles and elsewhere in U.S. (more).
- He is active in professional societies as Chair (more), President EMD (more) and AIPG Texas Section Vice President. Elected Fellow in numerous societies (more).
- He has produced numerous publications and made many presentations (more),
- He served as Principal Lecturer - 4-month IET training program during 1990s (more).

❖ New Acquisitions in Environmental and Natural Resources Industry

- Expand I2M Activities into environmental remediation by acquiring small to medium sized companies in Texas and around the U.S.

- **1st Step** - currently developing relationships with potential subcontractors to bid on state and federal contract. See I2M News (more).

- **2nd Step** - merge or acquire similar other small to medium companies to add staff but reduce overhead via consolidated accounting and human resource functions for the purpose offering clients lower cost services while maintaining quality professional services.

- **3rd Step** – evaluate new acquisitions by inserting I2M management personnel to assist in the transition to becoming a viable division of the I2M Holding Group (more).

❖ New Acquisitions in Environmental and Natural Resources Industry (Continued)

- Evaluate potential acquisitions around the U.S. for Brownfields properties for clean-up and resale.

- Evaluate potential acquisitions around the U.S. for water treatment projects ranging from remediating contaminated water supplies to development of innovative water treatment technology to improve the quality of drinking water in rural or industrialized areas.

- Market and expand the well-known I2M mining team into the international mining merger and acquisition activities while mineral commodity prices are depressed to prepare for the next bull run in commodity prices over the coming years.

I2M Associates, LLC

2 Year Business Growth Plan

- **Management:** Each Silo will be led by a Partner, with build to 2-3 Project Managers, Project-Level Consultants, and Entry-Level Consultants.

* **Potential Acquisitions and Currently Part-Time**