

Academic Curriculum Vitae

Name: James Gregory Mueller
Present Address: Provectus Environmental Products, Inc.
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Education:

Northern Illinois University (1979-1980) General Studies

Southern Illinois University (1980-1983)

Degree: B.S., Plant and Soil Science

Responsibilities: course work; student worker in soil microbiology laboratory.

Southern Illinois University (1983-1985)

Degree: M.Sc., Soil Microbiology & Biochemistry

Responsibilities: course work and independent research; teaching assistant, 1) introductory soils, 2) soil microbiology lecture, 3) soil microbiology laboratory.

Clemson University (1985-1988)

Degree: Ph.D., Soil Microbiology & Biochemistry (Agronomy & Soils)

Responsibilities: course work and independent research; instructor advanced soil microbiology lecture and laboratory.

Postdoctoral Studies:

U. S. Environmental Protection Agency (1988-1990)

Position: U.S. EPA Postdoctoral Research Microbiologist, Microbial Ecology and Biotechnology Branch.

Responsibilities: define creosote and PAH biodegradation processes occurring *in situ*; assess the feasibility of various bioremediation technologies for effective site restoration.

Highlights:

Professional Experience:

Provectus Environmental Products, Inc. (May 1, 2014 – present)

Position: President

Responsibilities: Develop and commercialize internationally an acquired portfolio of patented/proprietary environmental biotechnologies. Manage private equity investment of new start-up company; Direct strategic initiatives for growth, expansion and development. Coordinate remedial designs and implementation internationally; Coordinate and manage all element of new business operations; Direct corporate R&D; Responsible for P&L.

PeroxyChem, LLC - Environmental Solutions Division (March 1, 2014 – April 15, 2014)

Position: Senior Technology Applications Manager

Responsibilities: Establish business operations in Latin America with an initial focus on Brazil and Colombia. Direct strategic account initiatives focused on industrial clients. Coordinate remedial designs and implementation internationally.

FMC Corporation (November 2011 – March 1, 2014 = Sold to PeroxyChem, LLC)

Position: Senior Technology Applications Manager

Responsibilities: Establish business operations in Latin America with an initial focus on Brazil and Colombia. Direct strategic account initiatives focused on industrial clients. Coordinate remedial designs and implementation internationally.

ADVENTUS AMERICAS INC (July, 2003 – November 11, 2011 = Sold to FMC)

Position: President / Director of Remedial Solutions and Strategies.

Responsibilities: Established business operations in the USA, South America and Europe for Adventus Remediation Technologies, Inc. (ART), a venture capital-based, Canadian company representing the former environmental biotechnology unit of W.R. Grace & Co. (GRA: NYSE). Direct new technology development, focused research and development, strategic alliances and international mergers / acquisitions. Adventus was sold to FMC Corporation in November, 2011.

MALCOLM PIRNIE, INC. (July 2002 – July 2003)

Position: Senior Consultant.

Responsibilities: One year special assignment to establish Midwest (Chicago) business operations for a 105-year old environmental wastewater firm headquartered in the NE USA. Successfully established profitable business operations and helped develop an office with 7 staff focused on environmental consulting and hazardous waste remediation - industrial applications.

URS/DAMES & MOORE (July 1997 – 2002)

Position: Senior Environmental Scientist / Director of International Advanced Remediation Technologies (ART) Program and Tier One Consultants Group

Responsibilities: Coordinate application of environmental biotechnology services for the Central and Eastern Divisions (including Latin America); develop new business based on application of advanced remedial technologies; implement by providing technical guidance, marketing support, and engineering and design assistance for the Company worldwide.

Labroides Dimidiatus, Inc. (LDD) - Israel (1999-present)

Position: Scientific Advisory Board

Responsibilities: Development of an environmental engineering and remediation company in Israel; focus on bioremediation operations.

Phytotech, Inc. (September, 1996 -1999)

Position: Scientific Advisory Board

Responsibilities: assist in the continued development, demonstration and commercialization of proprietary phytoremediation technologies by providing technical guidance, marketing support, and engineering/design assistance for full-scale field applications.

The EICON Group, Inc. (Environmental Infrastructure & Consultants) (Nov 1993 – July 1997)

Position: Chief Scientist, General Manager - Technology Applications Division

Responsibilities: SBP Technologies, Inc. (see below); Scientific advisor to the EICON Group which consisted of: 1) SBP Technologies, Inc., 2) SBP-NE, 3) Florida Groundwater Services, Inc., 4) Florida Remedial Services, Inc., 5) Westcott & Mapes, Inc., and 6) EICON Surveys, Inc.

Ver-Val Environmental Enterprises, Inc. (VVEE) (October 1993 - 1995)

Position: Co-founder, Senior Environmental Microbiologist

Responsibilities: Field bioremediation operations; U.S. DOD/DOE proposal writing (AFCEE, NAVFAC, Army Corp, *etcetera*).

University of West Florida - Center for Environmental Diagnostics and Bioremediation (Jan 1993-1995). *Position:* Adjunct Research Assistant Professor

Clemson University (May 1992-present)

Position: Adjunct Assistant Professor of Microbiology

SBP Technologies, Inc. (formerly Southern Bio Products) (May 1990-July, 1997)

Position: Co-founder, General Manager & Senior Environmental Microbiologist.

Technical Highlights:

- Two Level Three Science and Technology Achievement Awards from U.S. EPA, 1995.
- Lead Project Scientist for U.S.DOD Technology Demonstration/Validation Project (multiple year, multiple site SERDP award of \$2.45 million)
- Lead Project Scientist for 2 U.S. EPA SITE Demonstration Projects
- Acting Team Leader for Biodegradation Research, Microbial Ecology and Biotechnology Branch, U.S. EPA Environmental Research Laboratory at Gulf Breeze, FL (1992).
- Coordinate oil spill bioremediation research for U.S. EPA and SBP (1989-1991).
- Design and conduct of bench-, pilot-, and full-scale remediation projects; biotreatability studies.
- Develop protocols for evaluation of oil spill bioremediation products when applied to land and open waters (U.S. EPA, NETAC).

Corporate Development Highlights

- Liaison and Project Leader for International Technology Development Programs with private sector, U.S. and European Corporations and Governments.
- Achieved profitability during first or second year of commercial operations of all startup endeavors.
- Increased revenue from at least 50% to >500% annually for every commercial endeavor.
- Identified major acquisition targets and procured licenses or agreements for multiple (11) international joint business partners offering complementary technology and services.
- Identified and procured International Teaming Partners for joint business development and international technology applications.

Research Interests:

Basic and applied aspects of biological detoxification of pesticides and hazardous wastes; Isolation, characterization and management of native degraders as well as the design and construction of organisms potentially capable of more efficiently removing targeted compounds from contaminated environments; Developing protocol for proper evaluation and effective implementation of field-scale remediation technologies; Design, implementation and evaluation of advanced remediation technologies for laboratory-, pilot- and full-scale operations.

Honor Societies:

- Sigma Xi (not active)
- Gamma Sigma Delta (not active)

Certifications:

- OSHA Hazardous Waste Operations and Emergency Response Standard [29 CFR 1910.120(e)] - 40 hour HAZWOPER #CIH291032, 1991.
- 8-hour HAZWOPER refreshers
- Administrative Hearing and Trial Training Course

Recognitions:

- Two Scientific and Technological Achievement Awards, Level III recognition in the category of Control Systems and Technologies. U.S. EPA Office of Research and Development, Washington, D.C., 1995.
- Nominated for the State of Arkansas Scientific Advisory Board, 1994 -1996.
- Scientific and Technological Achievement Award, Level I (highest level; \$5000.00), recognition in the category of Transport and Fate. U.S. EPA Office of Research and Development, Washington, D.C., 1990.
- Outstanding Service Award, Alaskan Oil Spill Bioremediation Efforts, U.S. EPA, Gulf Breeze Environmental Research Laboratory, 1990.
- Special Recognition Award for Excellence in Biodegradation Research, U.S. EPA, Gulf Breeze Environmental Research Laboratory, 1989.
- First Place, Oral Research Presentation Graduate Student Competition, Weed Science Society of America, 1988.
- Third Place, Oral Research Presentation Graduate Student Competition, American Society of Agronomy, 1986.
- Graduate Student Representative to the College of Agricultural Sciences Research Committee, Clemson (1987-1988).
- Graduate Student Representative to the College of Agriculture Advisory Board, SIU-C (1984-1985).

Professional Affiliations:

- American Society of Agronomy (inactive)
- American Society for Microbiology
- National Groundwater Association
- Soil Science Society of America (inactive)
- Weed Science Society of America (inactive)

Activities:

- Reviewer, Environmental Science & Technology (1991 - 1999)
- Reviewer, Applied Environmental Microbiology (1992 - 2005)
- Reviewer, Kluwer Academic Publishers (1995-2002)
- Editorial Board, Antonio Van Leeuwenhoek, January 1995-2000
- Scientific Advisory Board, Phytotech, Inc., Princeton, NJ 1996-1998
- Scientific Advisory Board, *Labroides Dimidiatus* Environmental (LDD), Israel
- Editorial Board, Applied & Environmental Microbiology, January 1999-2004
- Review Committee – Battelle’s *In Situ* and On-Site Bioremediation Symposium, 1999
- Review Committee – Battelle’s *In Situ* and On-Site Bioremediation Symposium, 2001
- Review Committee – Battelle’s *In Situ* and On-Site Bioremediation Symposium, 2002
- Review Committee/Session Chair – Battelle’s *In Situ* and On-Site Bioremediation Symposium, 2003
- Review Committee/Session Chair – Battelle’s *In Situ* and On-Site Bioremediation Symposium, 2004
- Review Committee/Session Chair – Battelle’s *In Situ* and On-Site Bioremediation Symposium, 2005
- Review Committee/Session Chair – Battelle’s *In Situ* and On-Site Bioremediation Symposium, 2006
- Review Committee/Session Chair – Battelle’s *In Situ* and On-Site Bioremediation Symposium, 2007
- Review Committee/Session Chair – Battelle’s *In Situ* and On-Site Bioremediation Symposium, 2008
- Review Committee/Session Chair – Battelle’s *In Situ* and On-Site Bioremediation Symposium, 2009
- Review Committee/Session Chair – Battelle’s *In Situ* and On-Site Bioremediation Symposium, 2010
- Review Committee/Session Chair – Battelle’s *In Situ* and On-Site Bioremediation Symposium, 2011
- Review Committee/Session Chair – Battelle’s *In Situ* and On-Site Bioremediation Symposium, 2012
- Review Committee – 21st Annual International Conference on Soils, Sediments and Water (UMASS Symposium), 2005
- Review Committee/Session Chair – Oxidation and Reduction Technologies (ORT’s-1) for *In Situ* Treatment of Soils and Water, 2004.
- Review Committee/Session Chair – Oxidation and Reduction Technologies (ORT’s-2) for *In Situ* Treatment of Soils and Water, 2005
- Review Committee/Session Chair – Challenges in Site Remediation (CSR-1) for *In Situ* Treatment of Soils and Water, 2005

Master’s Thesis:

Mueller, J.G. 1985. Enhancement of soybean nodulation via multiple antibiotic resistant mutants of *Rhizobium japonicum* strain 110. Master Thesis. Southern Illinois University, Carbondale, Illinois. 59 pages.

Doctoral Dissertation:

Mueller, J.G. 1988. Biodegradation of carbamothioate herbicides. Doctoral Dissertation. Clemson University, Clemson, South Carolina. 111 pages.

Refereed Publications:

Mueller, J.G., H.D. Skipper, E.R. Shipe, L.W. Grimes and S.C. Wagner. 1988. Intrinsic antibiotic resistance in *Bradyrhizobium japonicum*. *Soil Biol. Biochem.* 20:879-882.

Mueller, J.G., H.D. Skipper and E.L. Kline. 1988. Loss of butylate-utilizing ability by a *Flavobacterium* sp.. *Pestic. Biochem. Phys.* 32:189-196.

Mueller, J.G., H.D. Skipper and E.L. Kline. 1989. Bacterial stimulation by carbamothioate herbicides. *Weed Sci.* 37:424-427.

Mueller, J.G., P.J. Chapman and P.H. Pritchard. 1989. Creosote-contaminated sites: Their potential for bioremediation. *Environ. Sci. Technol.* 23:1197-1201.

Mueller, J.G., P.J. Chapman and P.H. Pritchard. 1989. Action of a fluoranthene-utilizing bacterial community on polycyclic aromatic hydrocarbon components of creosote. *Appl. Environ. Microbiol.* 55:3085-3090. *1989 U.S. EPA Scientific and Technological Achievement Award, Level I.*

Mueller, J.G., P.J. Chapman, B.O. Blattmann and P.H. Pritchard. 1990. Isolation and characterization of a fluoranthene-utilizing strain of *Pseudomonas paucimobilis*. *Appl. Environ. Microbiol.* 56:1079-1086.

Mueller, J.G., S.E. Lantz, B.O. Blattmann and P.J. Chapman. 1990. Alternative biological treatment processes for remediation of creosote-contaminated materials: bench-scale treatability studies. EPA/600/9-90/049. 89 p.

Mueller, J.G., S.E. Lantz, B.O. Blattmann and P.J. Chapman. 1991. Bench-scale evaluation of alternative biological treatment processes for the remediation of pentachlorophenol- and creosote-contaminated materials: solid-phase bioremediation. *Environ. Sci. Technol.* 25:1045-1055.

Mueller, J.G., S.E. Lantz, B.O. Blattmann and P.J. Chapman. 1991. Bench-scale evaluation of alternative biological treatment processes for the remediation of pentachlorophenol- and creosote-contaminated materials: slurry-phase bioremediation. *Environ. Sci. Technol.* 25:1055-1061.

Mueller, J.G., D.P. Middaugh, S.E. Lantz and P.J. Chapman. 1991. Biodegradation of creosote and pentachlorophenol in groundwater: chemical and biological assessment. *Appl. Environ. Microbiol.* 57:1277-1285.

Middaugh, D.P., J.G. Mueller, R.L. Thomas, S.E. Lantz, M.J.Hemmer, G.T. Brooks and P.J. Chapman. 1991. Detoxification of creosote- and PCP-contaminated groundwater by physical extraction: chemical and biological assessment. *Arch. Environ. Contam. Toxicol.* 21:233-244.

Mueller, J.G., S.M. Resnick, M.E. Shelton, and P.H. Pritchard. 1992. Effect of inoculation on the biodegradation of weathered Prudhoe Bay crude oil. *J. Indust. Microbiol.* 10:95-105.

Middaugh, D.P., S.M. Resnick, S.E. Lantz, C.S. Heard and J.G. Mueller. 1993. Toxicological assessment of biodegraded pentachlorophenol: Microtox and fish embryos. *Arch. Environ. Contam. Toxicol.* 24:165-172.

Mueller, J.G., S.E. Lantz, R.J. Colvin, D. Ross, D.P. Middaugh and P.H. Pritchard. 1993. Strategy using bioreactors and specially selected microorganisms for bioremediation of groundwater contaminated with creosote and pentachlorophenol. *Environ. Sci. Technol.* 27:691-698.

Mueller, J.G., J.-E. Lin, S.E. Lantz, and P.H. Pritchard. 1993. Recent Developments in Cleanup Technologies: Implementing Innovative Bioremediation Technologies. *Remediation/ Summer Issue* 369-381.

Pritchard, P.H., J.G. Mueller, J.C. Rogers, F.V. Kremer and J.A. Glaser. 1993. Oil spill bioremediation: Experiences, lessons and results from the *Exxon Valdez* oil spill in Alaska. *Biodegradation* 3:315-335.

Middaugh, D.P., S.E. Lantz, C.S. Heard and J.G. Mueller. 1994. Field-scale testing of a two-stage bioreactor for removal of creosote and pentachlorophenol from ground water: chemical and biological assessment. *Arch. Environ. Contam. Toxicol.* 26:320-328. *1995 U.S. EPA Scientific and Technological Achievement Award, Level III.*

Middaugh, D.P., R. Thomas, C.S. Heard, S.E. Lantz and J.G. Mueller. 1994. Field-scale testing of a hyperfiltration unit for removal of creosote and pentachlorophenol from ground water: chemical and biological assessment. *Arch. Environ. Contam. Toxicol.* 26:309-319. *1995 U.S. EPA Scientific and Technological Achievement Award, Level III.*

Mueller, J.G., R. Devereux, D.S. Santavy, S.E. Lantz, S. Willis and P.H. Pritchard. 1997. Phylogenetic and physiological comparisons of PAH-degrading microorganisms from geographically diverse soils. *Antonie Van Leeuwenhoek.* 71:329-343.

Sharak-Genthner, B.R., S.E. Lantz and J.G. Mueller. 1997. Persistence of polycyclic aromatic hydrocarbon components of creosote under anaerobic enrichment conditions. *Arch. Environ. Contamin. Toxicol.* 32:99-105.

Borchert, S.M., F.S. Lakhwala and J.G. Mueller. 1997. UVB Technology invigorates microbes at a Superfund Site. *Soil & Groundwater Cleanup.* February/March Issue: pages 6-10.

- Lantz, S.E., M.T. Montgomery, W.W. Schultz, P.H. Pritchard, B.J. Spargo, and J.G. Mueller. 1997. Constituents of an organic wood preservative that inhibit the fluoranthene-degrading ability of *Sphingomonas paucimobilis* strain EPA505. *Environ. Sci. Technol.* 31: 3573-3580.
- Kelley, C.A., R.B. Coffin, and J.G. Mueller. 1998. Stable Isotope Analyses – An Innovative Technique to Monitor Biodegradation of Petroleum Hydrocarbons. *Geotechnical News* September: 20-24.
- Lakhwala, F., R.J. Desrosiers and J.G. Mueller. 1998. Demonstration of a microbiologically enhanced vertical groundwater circulation well technology at a Superfund site. *Groundwater Monitoring and Remediation*. Spring: 97-106.
- Kelley, C.A., R.B. Coffin, and J.G. Mueller. 1998. Stable Isotope Analyses – An innovative technique to monitor biodegradation of petroleum hydrocarbons. *GeoTechnical News*, September, 1998, Pages 20-24.
- Hammer, B.T., C.A. Kelley, R. B. Coffin, L.A. Cifuentes, J. G. Mueller. 1998. $\delta^{13}C$ values of polycyclic aromatic hydrocarbons collected from two creosote-contaminated sites. *Chem. Geol.* 152: 43-58.
- Trust, B.A., D.L. Hesse, R.B. Coffin, J.G. Mueller, and L.A. Cifuentes. 1999. Tracing biodegradation with stable carbon isotope measurements of respired CO_2 . *Bioremediation Journal*.
- Mueller, J., M. Ohr, B. Wardwell, D. and F. Lakhwala. 1999. mGCW Technology for Remediation of Groundwater Containing Chlorinated Hydrocarbons and Heavy Metals: I – *In Situ* Hydraulics. *Soil & Groundwater Cleanup* Oct/Nov 1999: pages 8-14.
- Ho, Y-F., M. Jackson, Y-Yang, J.G. Mueller, and P.H. Pritchard. 2000. Characterization of Fluoranthene- and Pyrene-Degrading bacteria isolated from PAH-Contaminated Soils and Sediments and Comparison of Several *Sphingomonas* Sp.. *J. Ind. Microbiol. Biotechnol.* 24:100-112.
- Story, S.P., J.D. Kline, S.H. Parker, T-R J. Tzeng, J. Mueller and E. Kline. 2001. Identification of Intermediate metabolites of fluoranthene and phenanthrene degradation by three classes of TN5 mutants of *S. paucimobilis* EPA505 deficient in polycyclic aromatic hydrocarbon utilization. *Gene* 378-393.
- Story, S. P.; Parker, S. H.; Kline, J. D.; Tzeng, T.-R. J.; Mueller, J. G.; Kline, E. L. Identification of four structural genes and two putative promoters necessary for utilization of naphthalene, phenanthrene, and fluoranthene by *Sphingomonas paucimobilis* var. EPA 505. *Gene* **2000**, *260*, 155-169.
- Boyd, T. J., Montgomery, M. T., Spargo, B. J., Smith, D.C., Coffin, R. B., Kelley, C. A., and J. G. Mueller. 2001. Effects of oxygenation on hydrocarbon biodegradation in a hypoxic environment. *Bioremediation. J.* 5(2):145-157.

Montgomery, M. T., Spargo, B. J., Mueller, J. G., Coffin, R. B., Smith, D. C., and T. J. Boyd. 2002. Bacterial production stimulated across the zone of influence of a groundwater circulation well in a BTEX-contaminated aquifer. *Ground Water Monitoring and Remediation*. Summer 2002:144-150.

Seech, A., J. Mueller. 2006. A Tale of Two Sites – Treatment of Explosives. *Pollution and Engineering News*, April 2006. Pages 30-34.

Mueller, J., J. Moreno and E. Dmitrovic. 2006. *In situ* biogeochemical stabilization of creosote/pentachlorophenol NAPLs using catalyzed and buffered permanganate: pilot and full scale application. *Land Contamination & Reclamation*, Volume 14, Number 2, pp. 625-629 (5).

Seech, A. and J. Mueller. 2007. Pesticide Termination: Remediation Strategies. *Environmental Protection*, May 2007

Mueller, J. J. Moreno, M. Dingens and P. Vella. 2007. Stabilizing the NAPL Threat: In Situ Biogeochemical Stabilization and Flux Reduction using Catalyzed Permanganate. *Pollution Engineering*, March 2007.

Dolfing, J. M. van Eckert, A. Seech, J. Vogan and J. Mueller. 2008. *In Situ* Chemical Reduction (ISCR) Technologies – Significance of Low Eh Reactions. *International Journal of Soil & Sediment Contamination* Volume 17, Issue 1, Pages 63-74.

Mueller, J. and R. Brown. 2008. Oxidation or Reduction – How to Decide? *Pollution Engineering News*, April 2008, pages 51-54.

Mueller, J. 2008. How To Bioremediate Chlorinated Solvents without Accumulating Metabolites. *Pollution Engineering News*, November 2008, page 51.

Peale, J.G., D., E. Bakkum, F. Lakhwala, J. Mueller and J. Molin. 2008. TCE-Plume Remediation via ISCR-Enhanced Bioremediation utilizing EHC and KB-1. *Remediation Journal*, Autumn 2008, pages 19-31.

Brown, R., J. Mueller, A. Seech, J. Henderson, J. Wilson. 2009. Interactions Between Biological and Abiotic Pathways in the Reduction of Chlorinated Solvents. *Remediation Journal* Winter 2009, pages 9-20.

Mueller, J., A. Przepiora, J. Molin, J. Valkenburg and L. Kinsman. 2010. Surprises from the Soil: Planning for the Unexpected. *Pollution Engineering News*, March 2010, pages.16-19.

Molin, J., J. Mueller, D. Hanson, T. Fowler and T. Skrotzki. 2010. *In situ* remediation of PCE at a site with clayey lithology and a significant smear zone. *Remediation Journal*, Vol 20 Issue 3, Pages 51 - 62

Peale, J.D.G., J. Mueller and J. Molin. 2010. Successful ISCR-enhanced bioremediation of a TCE DNAPL source utilizing EHC® and KB-1®. *Remediation Journal*, Vol 20 Issue 3, Pages 63 – 81.

Mueller, J. 2011. The generation of acetones and ketones – a positive process? Pollution Engineering News, September, 2011. Pages.32-37.

Mueller, M. and J. Mueller. 2011. Meeting NIMBY (How close is too close)? Pollution and Engineering News, November, 2011. Pages 24-27.

Fowler, T., B. Thompson and J. Mueller. 2011. Acetone and 2-Butanone Creation Associated with Biological and Chemical Remediation of Environmental Contamination. Remediation Journal, Winter 2011, pages 9-28.

Mueller, J., A. Karachalios and T. Fowler. 2014. Controlling Methane Production during ERD and ISCR Applications. Pollution Engineering News, October pp 24-29.

Mueller, J., and G. Booth. 2016. Managing Excessive Methanogenesis during ERD/ISCR Remedial Action Remediation Journal, Summer 2016 pages 53-71. Invited paper

Publications Submitted or in Preparation:

Coffin, R.B., M.T. Montgomery, C.A. Kelley, B.T. Hammer, L.A. Cifuentes, and J.G. Mueller. Nutrient cycling during *in situ* bioremediation using groundwater circulation well technology. Appl. Environ. Microbiol.

Jackson, M.M., P.H. Pritchard, Y. Yang, J.G. Mueller, and M.P. Shiaris. Identification of fluoranthene metabolites and its proposed oxidative pathway by *Sphingomonas* sp. strain CO6. Appl. Environ. Biotechnol.

Book Chapters:

Skipper, H.D., J.G. Mueller, V.L. Ward and S.C. Wagner. 1986. Microbial degradation of herbicides. In N.D. Camper (ed.), Research Methods in Weed Science, 3rd Ed. p. 245-267.

Pritchard, P.H., J.G. Mueller, J.C. Rogers, F.V. Kremer and J.A. Glaser. 1993. Oil spill bioremediation: Experiences, lessons and results from the *Exxon Valdez* oil spill in Alaska. In E. Rosenberg (ed.) Microorganisms to Combat Pollution. Kluwer Academic Publishers, Boston. Pages 191-230.

Mueller, J.G., S.E. Lantz, R. Devereux, J.D. Berg and P.H. Pritchard. 1994. Studies on the microbial ecology of PAH biodegradation. In R. Hinchee (ed.) In Situ and On-Site Bioreclamation. Lewis Publishers, Boca Raton, FL. Pages 218-230.

Pritchard, P.H., J.G. Mueller, S.E. Lantz and D.L. Santavy. 1995. The potential importance of biodiversity in environmental biotechnology applications: Bioremediation of PAH-contaminated soils and sediments. In D. Allsop *et al* (eds), Microbial Diversity and Ecosystem Function. Chapter 9 pages 161-182. CAB International Publishers. Invited Paper.

Mueller, J.G., M.D. Tischuk, M.D. Brouman, and G.E. Van de Steeg. 1995. Application of *in situ* bioremediation strategies to soil and ground water containing organic wood preservatives. In Battelle's Third International Symposium on *In Situ* and On-Site Bioreclamation. April 24-27, 1995. San Diego, CA 3(2):571-579.

Kelley, C.A., R.B. Coffin, L.A. Cifuentes, S.E. Lantz and J.G. Mueller. 1995. The use of GC/C/IRMS coupled with GC/MS to monitor biodegradation of petroleum hydrocarbons. In Battelle's Third International Symposium on *In Situ* and On-Site Bioreclamation. April 24-27, 1995. San Diego, CA.

Lakhwala, F., R. Desrosier, E. Klingel, W. Langley and J.G. Mueller. 1995. *In situ* treatment of TCE contaminated ground water using an integrated bioreactor in a groundwater circulation well. In Battelle's Third International Symposium on *In Situ* and On-Site Bioreclamation. April 24-27, 1995. San Diego, CA.

Trust, B.A., J.G. Mueller, R.B. Coffin and L.A. Cifuentes. 1995. The biodegradation of fluoranthene by *Sphingomonas paucimobilis* as monitored by stable isotope ratio analysis. In Battelle's Third International Symposium on *In Situ* and On-Site Bioreclamation. April 24-27, 1995. San Diego, CA 3(5):233-239.

Lantz, S.E., J-E Lin, J.G. Mueller and Pritchard*, P.H.. 1995. Effects of surfactants on fluoranthene mineralization by *Sphingomonas paucimobilis* strain EPA505. In Battelle's Third International Symposium on *In Situ* and On-Site Bioreclamation. April 24-27, 1995. San Diego, CA 3(8):7-14.

Pritchard, P.H., J-E Lin, S.E. Lantz, J.G. Mueller and W.W. Schultz. 1995. The use of encapsulation/ immobilization techniques for bioaugmentation procedures in the bioremediation of high molecular weight PAHs. In Battelle's Third International Symposium on *In Situ* and On-Site Bioreclamation. April 24-27, 1995. San Diego, CA 3(3):211-220.

Mueller, J.G., C.E. Cerniglia and P.H. Pritchard. 1996. Bioremediation of Environments Contaminated by Polycyclic Aromatic Hydrocarbons. In R. Crawford and D. Crawford (eds), *Bioremediation: Principles and Applications*. Chapter 5, Pages 125-194. Cambridge University Press.

Borchert, S., R. Desrosiers, F. Lakhwala, and J. Mueller. 1996. *In situ* bioremediation using the UVB technology: A case study. In Kostecki, P., Calabreses, E., and Bonazountas, M. (Eds), *Contaminated Soils*. Volume 2, Chapter 30, pp 369-378. Amherst Scientific Publishers, Amherst, MA.

Spargo, B.J. (ed) "*In Situ* Bioremediation and Efficacy Monitoring". US NAVY, Naval Research Laboratory, Washington D.C. NRL/PU/6115-96-317. October 1996. 323 pages.

Mueller, J., E. Klingel, M.D. Brouman, R.B. Coffin, L.A. Cifuentes, W.W. Schultz, and B.J. Spargo. 1996. Field Demonstration of *In Situ* Chemical Containment Technologies Case Study: Naval Battalion Command, Port Hueneme, CA. In Spargo, B.J. (ed) "*In Situ* Bioremediation and Efficacy Monitoring". US NAVY, Naval Research Laboratory, Washington D.C. NRL/PU/6115-96-317. October 1996. Pages 3-12.

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Scalzi, M., A. Karachalios and J. Mueller. 2016. Inhibition of Methanogenesis to Control Wood Boring Insects and Pestilence – essential oil. US PTO filing 15/269,903

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Research Grants Awarded:

USDA Competitive Grant: Loss of herbicide efficacy by microbial mediated processes; \$50,000.00

Milkhaus South Laboratories: Mineralization of alachlor by pure and mixed bacterial cultures; \$3,500.00.

Southern Bio Products, Inc.: Laboratory and field evaluation of multi-stage creosote and PCB biotreatment processes; \$250,000.00

Massey-Burch Investment Group: Bioremediation of hazardous wastes: Venture Capital for SBP Technologies, Inc. \$3,500,000.00

Groundwater Pollution Prevention Fund, Office of Environmental Processes and Effects Research: Reduction of Pesticide Applications through Bioregulation; \$700,000.00

U.S. EPA Innovative Research Program: Role of plasmid transfer in microbial adaptation processes; \$50,000.00

Superfund Program, U.S. Environmental Protection Agency, Region IV: Biotreatability of creosote-contaminated soil and water: bench studies; \$92,000.00

Superfund Innovative Technologies Evaluation (SITE) Program: Biological treatment for the remediation of creosote and creosote derivatives in an aqueous state: pilot-scale demonstration; \$1,250,000.00

Norwegian State Railway: Microbial Ecology of PAH Biodegradation \$10,000 joint with Aquateam, Inc. (Norway) and U.S. EPA (\$60,000).

National Institute of Health, SBIR: Biological indicators for hazardous waste technologies; \$50,000 Phase I.

Strategic Environmental Research and Development Program (SERDP), U.S. DOD/U.S.EPA: *In situ* bioremediation and efficacy monitoring for fossil fuel contamination. \$4,800,000.00

U.S. Naval Research Laboratory: *In situ* bioremediation of PAH-contaminated sediments using encapsulated catalysts: \$990,000.00

U.S. DOD Dem/Val: Field monitoring of *in situ* bioremediation using overlapping ground water circulation cells (UVB biocurtain): \$250,000.00.

Superfund Innovative Technologies Evaluation (SITE) Program: *In situ* groundwater treatment using microbiologically enhanced groundwater circulation technology: full-scale field demonstration \$250,000.00.

Countries Worked In:

United States of America, (Argentina), Australia, Austria, Belgium, Brazil, Canada, China, Colombia, Czech Republic, Denmark, France, Germany, Hungary, Israel, Italy, Jordan, Latvia, (Libya), Lithuania, Macedonia, Mexico, Norway, Poland, Slovakia, Spain, Sweden, Taiwan, Thailand, United Kingdom, (Vietnam) and Venezuela.

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