Technology Innovation News Survey

Entries for September 1-15, 2015

Market/Commercialization Information

2015 SBIR PHASE I SOLICITATION

U.S. EPA, RTP Procurement Operations Division, Research Triangle Park, NC.
Federal Business Opportunities, FBO-5068, Solicitation SOL-NC-16-00001, 2015

The Environmental Protection Agency plans to issue a Small Business Innovation Research opportunity for FY 2016 on or about October 22, 2015. EPA contemplates awarding up to 18 firm-fixed-price 6-month contracts of $100,000 each for Phase 1 SBIR proposals to conduct R&D or feasibility-related experimental research on Agency topics of interest. Current topics of interest include toxic chemicals (Topic 4) and water (Topic 5). The anticipated due date for proposals is December 10, 2015. Phase 1 awards are anticipated by July 16, 2016. Details will be posted on FedConnect at https://www.fedconnect.net/FedConnect/?doc=SOL-NC-16-00001&agency=EPA. The Small Business Administration maintains a Company Registry at http://www.SBIR.gov in which each small business applying for an SBIR award must register prior to submitting a proposal to any federal participant in the SBIR Program.
https://www.fbo.gov/spg/EPA/OAM/CMD/SOL-NC-16-00001/listing.html

FORMERLY UTILIZED SITES REMEDIAL ACTION PROGRAM (FUSRAP)

Department of the Army, U.S. Army Corps of Engineers, USACE District St. Louis, Missouri.
Federal Business Opportunities, FBO-5061, Solicitation W912P9-16-R-0002, 2015

The U.S. Army Corps of Engineers has a requirement for a contract to provide for hazardous, toxic, and radioactive waste remediation activities managed by the USACE St. Louis District. The work at the FUSRAP St. Louis sites falls under CERCLA on properties ranging from heavily industrialized areas to open fields. The St. Louis FUSRAP sites contain low-level radiological and chemically contaminated material in two primary vicinities: St. Louis Downtown and St. Louis North County (the latter comprises the St. Louis Airport site and vicinity properties and the Hiss/Latty Avenue properties). Contaminated accessible soil remaining for excavation and offsite disposal currently is estimated at 182,700 yd^3. This procurement is a total small business set-aside. Proposals are due by 10:00 AM CT on November 20, 2015. https://www.fbo.gov/notices/4f32e5e5d9a13c7b7553bdf070c943b2

REGIONAL ENVIRONMENTAL ACQUISITION TOOL: MILITARY MUNITIONS RESPONSE PROGRAM (MMRP)

U.S. Army Corps of Engineers, Savannah District, Georgia.
Federal Business Opportunities, FBO-5068, Solicitation W912HN-15-R-0035, 2015

The U.S. Army Corps of Engineers, Savannah District (SAD), intends to advertise for a multiple-award task-order contract (MATOC) comprising a pool of up to four IDIQ-type contracts with a total capacity of $48M. The acquisition will be set aside for economically disadvantaged 8(a) small business concerns (NAICS code 562910, Remediation Services) and will be solicited and awarded on a competitive basis. The four contracts are to serve all states within SAD (Alabama, Tennessee, Florida, Georgia, Mississippi, North Carolina, and South Carolina), Puerto Rico, U.S. Virgin Islands, Guam, and Central America. The contracts will consist of a 3-year base period and one 2-year option period. All MATOC awardees will be afforded fair opportunity to compete for task orders. Release of the RPF on FedBizOpps is anticipated on or shortly after October 22, 2015.
https://www.fbo.gov/spg/USA/COE/DACA21/W912HN-15-R-0035/listing.html

ENVIRONMENTAL SYSTEM SCIENCE

U.S. DOE, Office of Science, Funding Opportunity DE-FOA-0001437, 2015

The Office of Biological and Environmental Research within DOE's Office of Science solicits proposals for research in Environmental Systems Science (ESS), including Terrestrial Ecosystem Science and Subsurface Biogeochemical Research. The goal of ESS activity is to advance a robust predictive understanding of terrestrial environments, extending from bedrock to the top of the vegetated canopy and from molecular to global scales in support of DOE's energy and environmental missions. State-of-science understanding is captured in conceptual theories and models that can be translated into a hierarchy of computational components and used to predict the system response to perturbations caused, for example, by changes in climate, land use/cover, or contaminant loading. Estimated total program funding is $5M, with an award ceiling of $600,000. A pre-application letter of intent is required and due by November 11, 2015. This opportunity closes January 22, 2016. http://science.energy.gov/~/media/grants/pdf/foas/2016/SC_FOA_0001437.pdf

SOLID WASTE MANAGEMENT GRANT PROGRAM FY16

Department of Agriculture, Utilities Programs, Funding Opportunity SWMFY16, 2015

The SWM Grant Program was established to assist communities through free technical assistance and training provided by the grant recipients. Qualified organizations will receive SWM grant funds to reduce or eliminate pollution of water resources in rural areas. Funds may be used to (1) evaluate current landfill conditions to determine threats to water resources in rural areas; (2) provide technical assistance and/or training to enhance operator skills in the maintenance and operation of active landfills in rural areas; (3) provide technical assistance or training to help associations reduce the solid waste stream; and (4) provide technical assistance or training on the development and implementation of closure plans, future land use plans, safety and maintenance planning, and closure scheduling within permit requirements for operators of landfills in rural areas that are closed or will soon close. The closing date for applications is December 31, 2015. http://www.rd.usda.gov/programs-services/water-waste-disposal-technical-assistance-training-grants

Cleanup News

WIND-POWERED GROUNDWATER SPARGING AT FARNWORTH LAKE

Government Canada, En4-235/2013E-PDF, 2 pp, 2014

The Farnworth Lake Floatplane Base is located in Canada in an isolated area about 10 km southwest of Churchill, Manitoba. Over many years of aviation storage and fueling, petroleum hydrocarbons contaminated the groundwater, with potential effects on a nearby lake. The remediation plan had to contend with the site's remote location far off the electrical grid in an area subject to harsh subarctic weather conditions. The site contractor designed a system powered by four wind-powered turbines to supply air for sparging to remediate BTEX contamination in the groundwater. The windmills selected for the site are typically used to aerate fish ponds or to fill livestock watering sloughs. The compressor delivers air through two lines ("header cells") installed through the groundwater plumes to increase pressure on the groundwater, thus driving out the more volatile contaminants. The turbine units are decommissioned and stored over the winter months. The windmill sparging system was installed in 2010 and has proven highly effective, with considerable cost savings compared to conventional sparge systems.
http://www.federalcontaminatedsites.gc.ca/20C563C3-D699-4284-8780-CCDB27ADB495/1454%20Farnworth_FCSAP_Profile_En_02.pdf

POINT COOK THERMAL DESORPTION REMEDIATION PROJECT

McKay, D., J. Denham, and W. Magnus.
CleanUp 2015 Conference, Melbourne, Australia, 13-16 September 2015. CRC CARE: Cooperative Research Centre for Contamination

Assessment & Remediation of the Environment, Abstract, 2015

In late 2013, a direct-fired thermal desorption (DTD) plant was mobilized from the United States to a former fire training area at RAAF Williams Base, Point Cook, Victoria, Australia. Following installation and commissioning of the plant and completion of successful proof of performance testing at a feed rate of 23 tonnes per hour in April 2014, full-scale treatment operations commenced. After optimization, the DTD operated at up to 30 tonnes per hour. Treatment activities ceased in February 2015, and the site has been rehabilitated and revegetated.
Longer abstract: http://www.cleanup2015.com.au/pdf/301_350/0307.pdf
Additional information: http://www.defence.gov.au/id/_Master/docs/PointCook/CommunityConsultationFlyerType2-V9.pdf

Demonstrations / Feasibility Studies

CONTRIBUTIONS OF ABIOTIC AND BIOTIC DECHLORINATION FOLLOWING CARBOXYMETHYL CELLULOSE STABILIZED NANOSCALE ZERO VALENT IRON INJECTION

Kocur, C.M.D., L. Lomheim, H.K. Boparai, A.I.A. Chowdhury, K.P. Weber, L.M. Austrins, E.A. Edwards, B.E. Sleep, and D.M. O'Carroll.
Environmental Science & Technology, Vol 49 No 14, 8648-8656, 2015

A pilot-scale injection of nanoscale zerovalent iron (NZVI) stabilized with carboxymethyl cellulose (CMC) was performed at an active field site contaminated with a range of chlorinated VOCs (CVOCs). CVOC concentrations and microbial populations were monitored at the site before and after NZVI injection. The remedial injection successfully reduced parent compound concentrations on site. A period of abiotic degradation was followed by a period of enhanced biotic degradation. Results suggest that the NZVI/CMC injection created conditions that stimulated the native populations of organohalide-respiring microorganisms. *Dehalococcoides* spp. abundance immediately following the NZVI/CMC injection increased by an order of magnitude throughout the treated area relative to pre-injection abundance. Distinctly higher CVOC degradation occurred over a 3-week evaluation period following NZVI/CMC injection when compared to control wells. Both abiotic and biotic degradation appear to have occurred following injection. *For additional information on this project, see C.M.D. Kocur's Ph.D. dissertation at* http://ir.lib.uwo.ca/cgi/viewcontent.cgi?article=4602&context=etd.

PUMP-AND-TREAT GROUNDWATER REMEDIATION USING CHLORINE/ULTRAVIOLET ADVANCED OXIDATION PROCESSES

Boal, A.K., C. Rhodes, and S. Garcia.
Groundwater Monitoring & Remediation, Vol 35 No 2, 93-100, 2015

Comparative studies of the use of chlorine/ultraviolet (Cl_2/UV) and hydrogen peroxide/ ultraviolet (H_2O_2/UV) advanced oxidation processes (AOPs) to remove TCE from groundwater in a pump-and-treat application were conducted for the first time at the full-scale operational level at two water treatment facilities operated by Aerojet-Rocketdyne in Northern California. In these pilot studies, aqueous chlorine replaced hydrogen peroxide in the AOP treatment step, where the oxidant is exposed to UV light to produce highly reactive radical species that degrade groundwater contaminants. At the site where the natural pH of the water was 7.1, TCE was removed to a concentration2/UV was readily removed using active carbon filtration, which is part of the facility's overall treatment train. The studies also verified that Cl_2/UV AOP did not interfere with the photolysis of N-nitrosodimethylamine or result in an effluent acutely toxic toward *Ceriodaphnia dubia*. Chemical costs associated with Cl_2/UV AOP were 25-50% of the costs associated with in-place H_2O_2/UV AOP treatment. **Associated slides:** http://blog.miox.com/wp-content/uploads/2014/05/2014-NGWS-presentation-v4.pdf

Research

QUANTIFYING SEEPAGE FLUX USING SEDIMENT TEMPERATURES

Lien, B.K. and R.G. Ford.
EPA 600-R-15-454, 50 pp, 2014

This report demonstrates different modeling approaches that use sediment temperatures to estimate the magnitude and direction of water flux across the groundwater-surface water transition zone. Following a review of analytical models based on steady-state or transient temperature solutions, case study applications of the modeling approaches are illustrated for two different field settings with quiescent and flowing surface water systems. For the quiescent system, two different steady-state models were used to evaluate temperature records from three depths to estimate groundwater seepage into a pond. For the flowing water system, two different transient models were applied to estimate water exchange across a granular cap placed atop sediments in a small river.
http://nepis.epa.gov/Exe/ZyPURL.cgi?Dockey=P100MP4G.txt

BIOTRANSFORMATION OF DIMETHYLARSINIC ACID: ENGINEERING ISSUE

U.S. EPA, Engineering Technical Support Center.
EPA 600-R-14-219, 14 pp, 2014

This paper summarizes the state of the science regarding the biotransformation of dimethylarsinic acid (DMA[V]), a once-popular herbicide. The (V) suffix in DMA(V) denotes the +5 oxidation state of arsenic. The authors surveyed peer-reviewed and gray literature, input from experts in the field, and other pertinent sources to review the current understanding of biologically mediated transformation of DMA(V) and its metabolites. Given the challenges remaining in transitioning from lab studies to field applications, this paper provides summary guidance for implementing currently recommended remediation strategies for DMA(V) at contaminated sites.
http://nepis.epa.gov/Adobe/PDF/P100MH3S.pdf

OMAHA SOIL MIXING STUDY: REDISTRIBUTION OF LEAD IN REMEDIATED RESIDENTIAL SOILS DUE TO EXCAVATION OR HOMEOWNER DISTURBANCE; OMAHA LEAD SUPERFUND SITE, OMAHA, NEBRASKA

Luxton, T.P., B.W. Miller, E. Holder, and J. Voit.
EPA 600-R-15-054, 61 pp, 2015

Urban soils within the Omaha Lead Superfund (OLS) site were contaminated with lead (Pb) from atmospheric deposition of particulate materials from lead smelting and recycling activities. The final ROD (May 2009) stated that any residential soil exceeding the preliminary remediation goal (a PRG of 400 mg Pb/kg soil) would be excavated, backfilled, and revegetated. The remedial action entailed excavating contaminated soil in the top 12 in; excavation could stop when the concentration of soil Pb was 1 ft. After removal of the contaminated soil, clean backfill was applied and a grass lawn was replanted. A depth of 12 in was based on the assumption that Pb-contaminated soil at depth greater than 1 ft would not represent a future risk, based on the principal that mixing and other factors encountered during normal excavation practices would not result in Pb surface concentrations above the PRG. Subsequently, Pb redistribution was investigated in remediated residential surface soils after typical homeowner earth-disturbing activities in the OLS site to determine whether soil mixing associated with normal homeowner excavation practices resulted in surface Pb concentrations above the PRG. Results from the 18 properties tested indicate that when Pb concentration was http://nepis.epa.gov/Adobe/PDF/P100MVEW.pdf

THE BIOGEOCHEMISTRY AND BIOREMEDIATION OF URANIUM AND OTHER PRIORITY RADIONUCLIDES

Newsome, L., K. Morris, and J.R. Lloyd.
Chemical Geology, Vol 363, 164-184, 2014

Microbial metabolism has the potential to alter the solubility of a broad range of priority radionuclides, including actinides and fission products, in uses such as the biostimulation of anaerobic microbial communities to remove redox-sensitive uranium U(VI) from

contaminated groundwater. This paper offers a review the mechanisms of U bioreduction and phosphate biomineralization and their suitability to facilitate long-term precipitation of U from groundwater, with particular focus on in situ trials at DOE field sites. The review also discusses redox interactions of technetium, neptunium, plutonium, americium, iodine, strontium, and cesium. *This paper is* ***Open Access*** *at* http://www.sciencedirect.com/science/article/pii/S0009254113004907.

REMEDIATION OF CHLORINATED ETHENES USING REACTIVE IRON BARRIER AND ITS IMPACT ON INDIGENOUS BACTERIA

Czinnerova, M., I. Sakmaryova, A. Sevcu, and M. Votrubova.
Proceedings of the 4th International Conference on Environmental Pollution and Remediation, 11-13 August 2014, Prague, Czech Republic. Paper No. 172, 4 pp, 2014

Under anaerobic conditions, PCE and TCE can be degraded by a sequence of reductive dechlorination steps through the intermediate products cis-DCE and VC to ethene. This process is driven either by specific microorganisms or by reductive agents, such as nano- or microscale zero-valent iron particles (NZVI or MZVI, respectively). In a field test, a permeable reactive barrier was prepared by applying a mixture of NZVI and MZVI to a series of wells downstream from the source of contamination. Polymerase chain reaction (PCR) and real-time PCR analysis of microbial composition of groundwater up- and downstream of the barrier revealed that the recovery of microbial colonization in groundwater, including bacteria capable of degrading chlorinated ethenes, was strongly influenced by iron-driven dechlorination. http://avestia.com/ICEPR2014_Proceedings/papers/172.pdf

FIELD SCALE APPLICATION OF NANOSCALE ZERO VALENT IRON: MOBILITY, CONTAMINANT DEGRADATION, AND IMPACT ON MICROBIAL COMMUNITIES

Kocur, Chris M.D., Ph.D. dissertation, University of Western Ontario, 300 pp, 2015

After verifying that nanoscale zero-valent iron (NZVI) synthesis methods can be safely scaled up and implemented at field scale, a successful demonstration was conducted of NZVI injection and mobility under constant head gravity injection into a utility corridor affected by chlorinated ethenes and ethanes in Sarnia, Ontario. NZVI detection and characterization using multiple methods proved that field mobility was reliably achieved. Additionally, long-term effects on the site's microbial communities were monitored to determine whether on-site organohalide-respiring species were enriched and CVOC degradation was sustained by the carboxymethyl cellulose polymer amendments that accompanied NZVI injection. Quantitative polymerase chain reaction was employed to target *Dehalococcoides* spp. (dhc) and vinyl chloride reductase genes (vcrA). The distinct zones where NZVI treatment was applied subsequently showed high abundance of dhc and vcrA. The methods used to target dhc and vcrA can serve as a template for future field investigations of NZVI mobility. http://ir.lib.uwo.ca/cgi/viewcontent.cgi?article=4602&context=etd

DEVELOPMENT OF METHODS FOR THE CHARACTERISATION OF ENGINEERED NANOPARTICLES USED FOR SOIL AND GROUNDWATER REMEDIATION

Chekli, Laura, Ph.D. thesis, University of Technology, Sydney, New South Wales, Australia. 309 pp, 2015

Developing novel methodologies to gain a better understanding of the behavior of engineered nanoparticles (ENPs) in the environment is crucial to assessing their potential risk. A multi-method approach that included flow field-flow fractionation, high-performance size-exclusion chromatography, and Fourier transform infrared spectroscopy was developed for thorough characterization of the behavior of iron oxide NPs (a surrogate for NZVI) under environmentally relevant conditions. The stability of iron oxide NPs coated with dissolved organic matter also was evaluated by assessing aggregation and disaggregation behavior over time. The following work was included in this research effort:

- Development of a novel method based on radiolabeling (Fe-59) to enable the detection and quantification of iron-based NPs in intact soil cores.
- Method improvement by coupling gamma counting and ICP-MS measurements to evaluate both the mobility of radiolabeled NPs and contaminant co-transport potential in soil.
- Development and demonstration of a simple method based on on-line light scattering measurement for characterizing NP aggregation behavior and aggregate structure in different natural waters.
- Combining the on-line light scattering method with off-line instruments, such as field-flow fractionation techniques, in a multi-method approach to gain complementary data on the particle size distribution of the samples.

https://opus.lib.uts.edu.au/research/bitstream/handle/10453/36996/02whole.pdf?sequence=2

METHODS FOR CHARACTERIZING THE FATE AND EFFECTS OF NANO ZEROVALENT IRON DURING GROUNDWATER REMEDIATION

Shia, Z., D. Fan, R.L. Johnson, P.G. Tratnyek, J.T. Nurmic, Y. Wud, and K.H. Williams.
Journal of Contaminant Hydrology, Vol 181, 17-35, 2015

This paper reviews current practice for both direct and indirect characterizations of nano zero-valent iron (NZVI) during groundwater remediation and explores prospects for improving these methods or refining the interpretation of the measurements. Results are presented based on laboratory batch and column studies of NZVI detection using chemical, electrochemical, and geophysical methods (e.g., using chemical redox probes for specific detection of NZVI). The potentiometric and voltammetric detections of iron nanoparticles using traditional stationary disc electrodes, rotating disc electrodes, and flow-through cell disc electrodes provide insight for interpreting ORP measurements, which are affected by solution chemistry conditions and the interactions between iron nanoparticles and the electrode surface. The geophysical methods used for characterizing ZVI during groundwater remediation are reviewed and assessed for application to NZVI detection. *This paper is* ***Open Access*** *at* http://www.sciencedirect.com/science/article/pii/S0169772215000339.

MEASURING THE REACTIVITY OF COMMERCIALLY AVAILABLE ZERO-VALENT IRON NANOPARTICLES USED FOR ENVIRONMENTAL REMEDIATION WITH IOPROMIDE

Schmid, D., V. Micic, S. Laumann, and T. Hofmann.
Journal of Contaminant Hydrology, Vol 181, 36-45, 2015

NZVI reactivity is affected by both water chemistry and the properties of the NZVI particle used. The reactivity of three types of commercially available Nanofer particles (Nanoiron, s.r.o., Czech Republic)—uncoated Nanofer 25 particles; polyacrylic acid-coated Nanofer 25S (with the highest potential for transport within porous media); and air-stable Nanofer Star particles (very easy to handle)—were investigated to elucidate nanoparticle reactivity under a simulated field setting. Reaction rate was highest for the uncoated Nanofer 25 particles, followed by the coated Nanofer 25S and air-stable Nanofer Star particles. The Nanofer Star particles were the least reactive of all the Nanofer products tested. The reaction kinetics predicted by column experiments provided more realistic results than the reaction kinetics predicted by batch experiments.

DETECTION AND CHARACTERIZATION OF ENGINEERED NANOMATERIALS IN THE ENVIRONMENT: CURRENT STATE-OF-THE-ART AND FUTURE DIRECTIONS — REPORT, ANNOTATED BIBLIOGRAPHY, AND IMAGE LIBRARY

Montano, M.D., J. Ranville, G.V. Lowry, J. Blue, N. Hiremath, S. Koenig, and M.E. Tuccillo.
EPA 600-R-14-244, 186 pp, 2014

This paper gives an overview of the challenges to nanoparticle detection and details possible methods for detecting, quantifying, and characterizing engineered nanoparticles (ENPs) in complex environmental matrices (e.g., water and soil/sediment), particularly against high background levels of ambient and naturally occurring nanoparticles. A description of the existing nanometrology tool kit is followed by a discussion of potential new measurement approaches that might overcome current limitations for ENP analysis in complex matrices. Estimates of ENP releases in life-cycle assessments suggest that the aqueous and soil/sediment environments will be the ultimate ENP reservoir. http://cfpub.epa.gov/si/si_public_file_download.cfm?p_download_id=520064

DETERMINATION OF NANOMECHANICAL PROPERTIES BY ATOMIC FORCE MICROSCOPY: SCIENTIFIC OPERATING PROCEDURE SOP-C-#
Cuddy, M.F., A.R. Poda, and M.S. Hull. ERDC/EL SR-15-1, 26 pp, 2015

This operating procedure describes how to determine the nanomechanical properties, hardness, and Young's modulus at solid surfaces using atomic force microscopy (AFM). Briefly, an appropriate AFM cantilever is calibrated to determine its deflection sensitivity and spring constant; it then is used as both an imager and indenter at the surface of material of interest. The load applied by the cantilever is accurately controlled by knowledge of the deflection sensitivity. The maximum applied load is mediated by the cantilever spring constant. Following data collection, image and force curve analyses are completed to determine projected indent areas and to load/unload profiles, thus yielding materials properties that include the material hardness and the Young's modulus along with corresponding surface topography. http://www.dtic.mil/cgi-bin/GetTRDoc?AD=ADA616441
This procedure is further discussed in a 12-minute video at https://www.youtube.com/watch?v=iSvh-Qs_2BA.

ENVIRONMENTAL CONSEQUENCES OF NANOTECHNOLOGIES: NANOPARTICLE DISPERSION IN AQUEOUS MEDIA: SOP-T-1
Coleman, J.G., A.J. Kennedy, and A.R. Harmon. ERDC/EL SR-15-2, 25 pp, 2015

Protocol SOP-T-1 provides guidance and step-by-step methods for (1) creating a working stock from nanoparticle (NP) powder and NP aqueous suspensions and (2) spiking working stock suspensions into aqueous bioassay media. The protocol also provides guidance on optimization of test media and organism health. This method was developed on procedures created specifically for metal NPs but may have broader application. http://el.erdc.usace.army.mil/elpubs/pdf/srel15-2.pdf

CHARACTERIZATION OF NANOMATERIALS USING FIELD FLOW FRACTIONATION AND SINGLE PARTICLE INDUCTIVELY COUPLED PLASMA MASS SPECTROMETERY (FFF-ICP-MS AND SP-ICP-MS): SCIENTIFIC OPERATING PROCEDURE SOP-C
Bednar, A.J., A.R. Poda, A.J. Kennedy, K.C. Armstrong, E.P. Gray, C. Higgins, and J.F. Ranville. ERDC/EL SR-15-3, 37 pp, 2015

This special report describes the operating procedure for analysis of engineered nanoparticles through various separation and detection techniques. These analytical tools were tested on a variety of extensively characterized gold and silver standard nanoparticles.
http://el.erdc.usace.army.mil/elpubs/pdf/srel15-3.pdf

PURIFICATION AND CONCENTRATION OF NANOPARTICLES USING DIAFILTRATION: SCIENTIFIC OPERATING PROCEDURE SERIES, SOP-P-1
Miller, L.F. and M.A. Chappell. ERDC/EL SR-15-4, 24 pp, 2015

Nanoparticle (NP) solutions, especially those synthesized in the lab, may contain additional solutes associated with synthesis and storage (e.g., ionic salts, suspension stabilizers, pH buffers, chelating agents). These contaminants can cause instability in the NP suspensions and otherwise modify suspension behavior in a way not representative of a pure solution. This report describes a diafiltration method used for controlling the initial properties of NP dispersion. http://el.erdc.usace.army.mil/elpubs/pdf/srel15-4.pdf

General News

GROUND WATER TECHNICAL CONSIDERATIONS DURING THE FIVE-YEAR REVIEW PROCESS: GROUND WATER FORUM ISSUE PAPER
U.S. EPA, Superfund Technical Support Project, Ground Water Forum.
EPA 542-F-15-010, 27 pp, 2015

This issue paper highlights technical considerations and technical resources available to remedial project managers in conducting five-year reviews (FYRs) at CERCLA sites with contaminated groundwater. This information might also be helpful to other federal and state agencies that have the lead for conducting FYRs and may assist EPA staff in reviewing those other-agency FYRs.
http://nepis.epa.gov/Exe/ZyPURL.cgi?Dockey=P100MH19.txt

PASSIVE SAMPLERS FOR INVESTIGATIONS OF AIR QUALITY: METHOD DESCRIPTION, IMPLEMENTATION, AND COMPARISON TO ALTERNATIVE SAMPLING METHODS
U.S. EPA, Engineering Technical Support Center.
EPA 600-R-14-434, 44 pp, 2014

This paper covers the basics of passive sampler design and then compares passive samplers to conventional methods of air sampling; discusses considerations for implementing a passive sampling program; and addresses field sampling and sample analysis considerations to ensure adequate data quality and supportable interpretations of the passive sample data. The reader is expected to have a basic technical background on the VI exposure pathway and the use and interpretation of indoor air sampling data.
http://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=P100MK4Z.pdf

SEDIMENT CLEANUP USERS MANUAL II (SCUM II)
Asher, C., L. Inouye, T. Michelsen, R. McMillan, L. Read, D. Bradley, P. Kmet, P. Adolphson, and I. Anderson.
Washington State Department of Ecology, Pub. No. 12-09-057, 538 pp + 356 pp Appendix, 2015

This update replaces the manual dated 1991 and provides guidance to Washington Department of Ecology staff in implementing the cleanup decision process for contaminated sediments—i.e., how sites are identified, investigated, remediated, and monitored—in Washington State. See also Appendix B for selected papers on sediment sampling and testing from several decades of Sediment Management Annual Review meetings, and the Appendix K spreadsheets for calculating risk-based chemical concentrations for sediment and tissue. https://fortress.wa.gov/ecy/publications/SummaryPages/1209057.html

ASSESSMENT AND TREATMENT OF CONTAMINATED SEDIMENTS
SERDP & ESTCP Webinar Series, 12:00 PM ET, Thursday, October 29, 2015

Join SERDP and ESTCP on October 29 for two presentations highlighting DoD research efforts on the assessment and treatment of contaminated sediments. Dr. Todd Bridges (U.S. Army Engineer Research and Development Center) will discuss the roles of biology, chemistry, and exposure in the development of resilient remedies. Dr. Kevin Sowers (University of Maryland) will talk about the in situ bioaugmentation treatment of PCB-contaminated sediments. To register for this free webinar, visit
https://serdp-estcp.org/Tools-and-Training/Webinar-Series/10-29-2015.

SAMPLER'S GUIDE: CONTRACT LABORATORY PROGRAM GUIDANCE FOR FIELD SAMPLERS
U.S. EPA, Office of Superfund Remediation and Technology Innovation.
EPA 540-R-014-013, OSWER 9200.2-147, 110 pp, 2014

The Contract Laboratory Program (CLP) is a national network of EPA personnel, commercial laboratories, and support contractors whose fundamental mission is to provide environmental sample collection and analysis under the Superfund program. This guide describes organizational roles and responsibilities for those who plan and conduct environmental sample collection for analysis through the CLP, covering statements of work, sampling documentation, the Scribe documentation software tool, sample collection and containers, and

similar topics. The guide does not define specific sampling procedures as these depend upon individual site conditions, EPA Regional requirements, and acceptance and performance criteria. http://nepis.epa.gov/Exe/ZyPURL.cgi?Dockey=P100LWNZ.txt

COST-EFFECTIVE, ULTRA-SENSITIVE GROUNDWATER MONITORING FOR SITE REMEDIATION AND MANAGEMENT: STANDARD OPERATING PROCEDURES WITH QA/QC

Halden, R. and I. Roll. ESTCP Project ER-201122, 20 pp, 2015

The decision to apply the In Situ Sampling (IS2) technology is based on specific site characteristics and the type of data desired. The primary product of pre-deployment work is a sampling matrix that describes the location, quantity of samples, and methods to be applied. A flow chart is provided to give an overview of the pre-deployment planning process. Answers to the questions asked through this process are used to populate the sampling matrix. Pre-deployment work ends with the mechanical preparation of the IS2 sampler. https://www.serdp-estcp.org/content/download/35371/339588/file/ER-201122-SOP.pdf

ENGINEERING TECHNICAL SUPPORT CENTER ANNUAL REPORT, FISCAL YEAR 2014

Bessler, S.M. and J. McKernan.
EPA 600-R-15-132, 28 pp, 2015

This report highlights selected projects that EPA's Engineering Technical Support Center (ETSC) supported throughout FY 2014. ETSC teams went into the field to spearhead projects at the cutting edge of remediation research in the areas of bioremediation and groundwater treatment, active sediment capping, in situ stabilization, and sustainable site cleanup. ETSC organized and reported significant developments in environmental engineering in several Engineering Issue papers as well as in peer-reviewed journal publications. ETSC also began newer initiatives that focus on integrating sustainability into communities and land-use plans. While ETSC's principal mission of bolstering technical expertise for site-specific remediation at contaminated sites remains a central focus, its teams are reaching out to support other efforts in prevention, thereby reducing EPA's future burden from legacy sites.
http://nepis.epa.gov/Exe/ZyPURL.cgi?Dockey=P100MVJ3.TXT

The Technology Innovation News Survey welcomes your comments and suggestions, as well as information about errors for correction. Please contact Michael Adam of the U.S. EPA Office of Superfund Remediation and Technology Innovation at adam.michael@epa.gov or (703) 603-9915 with any comments, suggestions, or corrections.

Mention of non-EPA documents, presentations, or papers does not constitute a U.S. EPA endorsement of their contents, only an acknowledgment that they exist and may be relevant to the Technology Innovation News Survey audience.