Entries for February 16-28, 2025

Market/Commercialization Information

F -- REMEDIAL ACTION OPERATIONS AT FORMER FORT DEVENS, DEVENS, MASSACHUSETTS (SOL)
U.S. Army Corps of Engineers, North Atlantic Division, New England District, Concord, MA
Contract Opportunities on SAM.gov W912WJ25RA002, 2025

This is a full and open competition under NAICS code 562910. The U.S. Army Corps of Engineers requires an environmental services contractor to support activities at former Fort Devens and the former Sudbury Training Annex on behalf of the Army under the BRAC Program. This contract will be a Single Award Task Order Contract (SATOC) Indefinite Delivery/Indefinite Quantity (ID/IQ) contract set-aside competitive acquisition action under the U.S. Small Business Administration (SBA) 8(a) Business Development Program. The major efforts under this SATOC will generally include environmental services at various sites related to (1) long-term monitoring; (2) operations and maintenance activities including landfill inspections; (3) remedial action operations; and (4) community relations support. The main contaminants detected at former Fort Devens include but are not limited to: solvents, petroleum and metals. This SATOC will also include environmental services related to addressing per- and polyfluoroalkylated substances (PFAS), which are present in soil and groundwater at multiple sites and currently in the remedial investigation phase of the CERCLA process. The efforts for the PFAS work may include: additional investigation; preparing remedial investigation reports, feasibility study reports, proposed plans and record of decisions; conducting pilot tests; implementing interim remedial action such as installation of point of entry treatment systems and implementing final remedial actions as specified in the record of decision. Offers are due by 2:00 PM EDT on April 30, 2025. https://sam.gov/opp/4e19cdbb63a24cda97edb9ed11a978ca/view

F -- EMERGENCY SPILL RESPONSE (SOL)
U.S. Department of the Army, Army Mission Installation Contracting Command, 418th CSB, Ft. Jackson, Columbia, SC
Contract Opportunities on SAM.gov W9124CQA002, 2025

This is a total small business set-aside. The Army Mission Installation Contracting Command seeks a contractor to perform 24-hour emergency response to spills and other environmental emergencies at Fort Jackson, South Carolina. The contractor shall provide 24-hour emergency spill response as well as tasks associated with the management of environmental regulatory programs and projects on Fort Jackson. Services include containment, cleanup, and proper disposal of materials, waste, and debris resulting from spills of hazardous materials or other regulated waste or products. The Contractor shall also provide response to other environmental program requirements such as collection of samples, removal of small underground storage tanks (USTs)/aboveground storage tanks (ASTs) and contaminated soil, site restoration and confirmation sampling, as well as provide support for a variety of other tasks associated with environmental regulatory compliance at Fort Jackson. The contract's period of performance shall be for one 12-month base period and four 12-month option periods. Quotes are due by 10:00 AM EDT on April 18, 2025.
https://sam.gov/opp/ca0d7f069129dc6daffffe71795dffa32/view

FISCAL YEAR 2025 NATIONAL ENVIRONMENTAL INFORMATION EXCHANGE NETWORK GRANT PROGRAM SOLICITATION NOTICE
Environmental Protection Agency, Funding Opportunity EPA-OMS-25-01, 2025

The Exchange Network (EN) was launched in 2002 as an intergovernmental, collaborative partnership of EPA, states, territories, and Tribes to foster better environmental management and decision-making through increased access to timely, high-quality environmental information. This was achieved through a standards-based approach to facilitate environmental data sharing among EPA, states, Tribes, and territories. The framework adopted allows organizations to exchange data over the Internet regardless of the specific information technology used. (See https://www.epa.gov/exchangenetwork and http://www.exchangenetwork.net/). The EN continues to evolve to adapt to emerging technologies and to meet new programmatic needs. The EPA EN Grant Program is soliciting project applications to:

- Facilitate sharing of environmental data, especially through shared and reusable services.
- Reduce burden and avoid costs for co-regulators and the regulated community.
- Streamline data collection and exchanges to improve its timeliness for decision-making.
- Increase the quality and access to environmental data through discovery, publishing, outbound and analytical services so it is more useful to environmental managers.
- Increase data and IT management capabilities needed to fully participate in the EN.

It is anticipated that up to 35 award(s) will be made under this announcement. Those applying under an individual opportunity may request up to $400,000 in funding. Those applying under a partnership opportunity may request funds up to $600,000 if the partnership eligibility criteria is met. Applicants specifically applying under the Individual Capacity Building with Mentorship opportunity may request up to $415,000 if all requirements are met. Awards funded under this opportunity are expected to have a 3-year project period. Applications are due by 11:59 pm ET on April 30, 2025. https://grants.gov/search-results-detail/358164

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Cleanup News

ACTIVE TO PASSIVE TREATMENT TRANSITION DESIGN FOR MINING INFLUENCED WATER
Anton, N. I DCHWS West 2024 Fall Symposium, 6-8 November, Denver, CO, 18 slides, 2024

The Luttrell mine waste repository is the regional repository for multiple Superfund and orphan mine sites. Collected leachate water at the repository is managed in an active water treatment plant and pilot biochemical reactor (BCR) system with disposal to a land application disposal (LAD). A full-scale BCR design was developed based on the pilot system that operated at the Luttrell repository for 17 years, successfully demonstrating the technology. The design was also completed for a full-scale leachate passive treatment system using parallel BCR cells, post-treatment settling, aeration, limestone channels, and a gravity-operated LAD system. The current active treatment plant uses a hydroxide precipitation process that is labor and material intensive. The new passive treatment system design changes the treatment process, requiring less labor, fuel, and materials to operate, while providing similar levels of treatment. The presentation focuses on challenges and lessons learned during execution of the remedial design for the passive treatment components and provides details of the pre-design investigation and design approach for the BCRs and LAD system, including field siting for the LAD, test pits, soil lithology logging, permeability testing, soil metal sorption studies, metal sorption capacity and water balance calculations, and hydraulic design.
https://mediacdn.guidebook.com/upload/213715/YOEVB6RoTG1VDH25DnXFxpikwUghYvmcE25.pdf

MAKING IT REMOTE - IMPLEMENTATION OF REMOTE OPERABILITY TO MAINTAIN OPERATIONAL EFFICIENCY WHILE REDUCING HEALTH AND SAFETY RISKS
Babcock, S. I DCHWS West 2024 Fall Symposium, 6-8 November, Denver, CO, 18 slides, 2024

An active lime treatment system was installed at the Gladstone Interim Water Treatment Plant (IWTP) in 2015 to treat mine-influenced water discharging from the Gold King Mine. The site is in a remote high mountain valley at ~10,500 ft of elevation and is subject to extreme weather conditions during winter and summer that may limit access to the site. The plant operates 24/7 to continuously monitor the influent pH and flow and adjust set points to maintain an effluent turbidity of < 10 NTUs. Operations of the IWTP can be challenging due to large seasonal fluctuations in the influent pH and flow conditions that can change rapidly. Additionally, polymer batching and equipment failures can cause an imbalance in the system that requires immediate adjustments that were historically performed onsite, which was problematic due to site access. Limited initial system automation required operators to respond to issues in person. Thus, the system was enhanced with more robust real-time monitoring, remote operations, and duplicate treatment systems to increase operational efficiencies while reducing health and safety risks. System enhancements included the installation of a secondary lime system, an uninterrupted power supply (UPS), a backup generator, and a real-time effluent turbidity monitor and automation of the polymer addition system. These modifications allow full system monitoring and operational control to maintain efficient operations from a remote location, successfully reducing the need for onsite personnel during extreme and possibly life-threatening conditions.
https://mediacdn.guidebook.com/upload/213715/5SAbiu19FLRc9rFOniM4UQxZrXaytL9MTm.pdf

COLLABORATING WITH PROJECT STAKEHOLDERS TO SELECT A RE-DESIGN APPROACH FOR LOWER LAKE DAM AT THE ASARCO TAYLOR SPRINGS SUPERFUND SITE
Lindholm, N. I DCHWS West 2024 Fall Symposium, 6-8 November, Denver, CO, 17 slides, 2024

EPA issued a ROD to address the contamination of soil, sediments, and groundwater by process residuals for the American Smelting and Refining Company Taylor Springs Superfund site. Waste products remained throughout the site as a result of operations of the former metals plant, including mining and storage of coal, and production of primary slab zinc, sulfuric acid, secondary slab zinc, and American and French Process zinc oxide. EPA proposed replacing the existing Lower Lake Dam spillway and covering the contamination on the dam crest with compacted clay to minimize the potential release of contaminated soil and process residuals and to stabilize the earthen dam embankment. A preliminary design investigation (PDI) included collecting geotechnical borings and performing a geophysical survey at Lower Lake Dam. The PDI data determined that the dam foundation material consists of multiple strata that are potentially liquefiable during a seismic event. The actual site conditions determined from the PDI varied from those conditions assumed in the ROD. Two alternatives were presented to revise the remedial design approach for Lower Lake Dam. Each was evaluated for constructability, cost, and technical considerations. As part of the evaluation of re-design alternatives, it was determined that mine-related subsidence risks to Lower Lake Dam needed to be considered. Project stakeholder workshops were conducted to allow for design issues to be discovered, discussed, and resolved early in the process. Stakeholder feedback and buy-in were integral in aligning design considerations, refining alternatives, and establishing a consensus revised design approach, thereby reducing the risk of change during later project phases. https://mediacdn.guidebook.com/upload/213715/BDuSZy3sIWn2YF13aqWbpcWUy8sfa2AZqk.pdf

SOIL GAS SURVEY RESULTS SUPPORTING GROUNDWATER CORRECTION ACTION PLAN (GCAP) DEVELOPMENT FOR THE MOAB SITE
Looney, B.B., H.H. VerMeulen, A. Coleman, K. Pill, T. Prichard, and J. Ritchey. SRNL Report SRNL-STI-2024-00227, 73 pp, 2024

A soil gas survey was performed at the Moab Uranium Mill Tailings Remedial Action site to confirm, identify, quantify, and refine secondary contaminant source area locations for U and NH_4^+/NH_3 in the vadose zone and shallow groundwater and provide information to develop the technical basis for the Groundwater Compliance Action Plan. The soil gas data will support the deployment of source control technologies. The gas-phase surrogate-indicator for uranium and its associated radionuclides was radon (Rn), and the surrogate-indicator gas phase analytes for NH_4^+/NH_3 were NH_3 and nitrous oxide. General geochemical indicator soil gases (CO_2, CH_4, and humidity) were also measured. Samples were collected using soil probes into Tedlar bags and all parameters were analyzed on site. Rn was measured using scintillation cells, and the other parameters were measured using a photoacoustic spectrometer. Soil gas samples were collected from 58 locations that represented 4 different spatial areas. Features associated with mill operations and other historical features were identified and targeted to support a high degree of granularity in data interpretation. The shallow survey identified residual U and NH_4^+ sources in the subsurface. The soil gas survey identified general areal differences in residual subsurface sources and identified small residual hot spot sources associated with the containment pond in the Mill Yard area and the purification pond in the tailings area. https://www.osti.gov/servlets/purl/2467336

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Demonstrations / Feasibility Studies

PASSIVE TREATMENT OF ACID MINE DRAINAGE EFFLUENTS USING CONSTRUCTED WETLANDS: CASE OF AN ABANDONED IRON MINE, MOROCCO

Naghoum, I., M. Edahbi, J.A.H. Melian, J.M.D. Rodriguez, N. Duraes, B.A. Pascual, and F. Salmoun. I Water 17:687(2025)

Two vertical subsurface flow (VF) constructed wetlands (CWs), one planted with *Juncus effusus* (PCW) and the other unplanted (CCW), were tested to remediate acid mine drainage (AMD) from the Ouixane abandoned mine site located in Morocco. The VFs were fed with highly acidic AMD (pH < 2.5) and evaluated for 150 days. The substrate was composed of limestone as a neutralizing agent, river gravel, and natural peat moss to promote the growth of sulfate-reducing bacteria (SRB) and metals precipitation. Results showed that both VFs successfully neutralized the acidity, with effluent pH values ranging from 3.57 to 8.5, indicating effective alkalinization of the AMD. Significant differences ($p < 0.05$) were observed between the metal removal rates of the CCW and the PCW, except for Mn. Both the PCW and CCW exhibited similar efficiencies in metal removal from the influent. The rates of metalloid removal were 99.9% vs. 99% for Cr, 99% vs. 80% for As, 96% vs. 94 for Zn, 99.94% vs. 99% for Fe, and 90% vs. 81% for Al. Microbial sulfate reduction increased from 43% to 50% due to the presence of plants. Sediment analysis revealed that metals were primarily in stable forms; Fe and Zn were mostly associated with Fe-Mn oxides, while Mn and Ni were predominantly present as carbonates. These observations indicate relatively stable metals in the CWs' sediment. Results highlight the effectiveness of the studied CWs, particularly those with vegetation for AMD remediation, emphasizing the importance of neutralizing agents, plants, and organic substrates in the treatment process. *This article is* ***Open Access*** *at* https://www.mdpi.com/2073-4441/17/5/687

ONGOING CASE STUDY, BERRY BRANCH SELENIUM PILOT TREATMENT SYSTEM USING SULFUR MODIFIED IRON, FORMER HOBET SURFACE MINE SITE, LINCOLN COUNTY, WEST VIRGINIA
Doss, R.B. I Proceedings of the West Virginia Mine Drainage Task Force Symposium and 15th International Mine Water Association Congress, 22-26 April, 4 pp, 2024

|A sulfur-modified iron (SMI) technology pilot system was used to treat selenium (Se) discharges at the former Hobet Surface Mine in the Mud River watershed. The system utilizes sulfur-modified catalytic zero-valent iron particles as an adsorptive medium to reduce selenite and selenate to elemental selenium. During the first 4½ months of operation, the system influent averaged 25.6 µg/L Se. Depending on pilot system flow rates and the state of SMI media depletion, the % reduction in Se concentrations at the immediate discharge from the system averaged 49.7% to 97.3%. Se not fully removed at the discharge appears to be bound to iron (Fe) being released from the pilot system. As Fe from the SMI media is oxidized and precipitated in post-treatment settling basins, additional reduction in Se concentrations occurs. Post-settling Se effluent concentrations at the NPDES outlet averaged ~1.0 µg/L, below the state water quality standard of 5 µg/L. Results show the SMI's potential to treat non-compliant Se concentrations appears feasible and promising. However, the life of SMI media needs to be extended, potentially with pre-treatment to lower influent ORP and better manage influent pH. The system will operate for an additional 12-18 months using different source waters with higher and lower Se concentrations. Future studies will focus on: replenishing media to study system effectiveness and media life using different influent water sources; extending media life by pre-treating to lower influent ORP and better control influent pH prior to entering the SMI vessels; determining the extent to which Se is bound to Fe discharge and the extent that Se concentrations can be further reduced by post-treatment settling and precipitation; performing economic capital and operating cost evaluations of the system; and estimating capital and operating costs to treat larger throughput volumes.
https://www.imwa.info/docs/imwa_2024/IMWA2024_Doss_145.pdf

PASSIVE TREATMENT OF MN: RESULTS FROM AN EXPERIMENTAL PILOT SYSTEM
Hedin, B., N. Wolfe, and R. Hedin. I Proceedings of the West Virginia Mine Drainage Task Force Symposium and 15th International Mine Water Association Congress, 22-26 April, 4 pp, 2024

The Pennsylvania Department of Environmental Protection recently proposed to lower the current in-stream Mn criterion from 1.0 mg/L Mn to a human health-based criterion of 0.3 mg/L Mn. Public objections to the proposed changes included the high costs of meeting the standard with conventional chemical treatment. Passive treatment was not considered a practical option for high flows because of its large land requirements and uncertain ability to lower Mn to < 0.3 mg/L. In response to these concerns, a project investigated 1) Mn removal by 19 existing, full-scale passive treatment systems and 2) two experimental, pilot-scale oxic aggregate beds. While all full-scale passive systems removed Mn, only one system removed Mn below 0.3 mg/L. Two pilot-scale units (Hollywood and Brandy Camp) received low-pH mine drainage containing Mn from large conventional mine water treatment systems. The Hollywood system treats low pH mine drainage with hydrated lime and polymer, and metals settle in a concrete clarifier. The Brandy Camp system treats drainage with hydrogen peroxide, polymer, and lime slurry, and metals settle in a series of ponds followed by a wetland. The Hollywood unit contained 33 t of Mn oxide-coated limestone from an operational passive Mn removal system. The aggregate gradation was AASHTO #3. The Brandy Camp pilot contained 11 tonnes of limestone from a local limestone quarry. The aggregate gradation was AASHTO #8. Experiments were conducted using varying flow rates and measuring influent and effluent chemistry. The Hollywood unit received circumneutral water containing an average of 0.6 mg/L dissolved Mn and 1.5 mg/L particulate Fe and was operated for 10 months. The Brandy Camp unit received circumneutral water containing an average 5.8 mg/L dissolved Mn and 1.7 mg/L particulate Fe and was operated for 12 months. Both systems decreased Mn to < 0.3 mg/L Mn. However, the kinetics of Mn removal differed substantially, determined by changes in Mn concentration and theoretical retention times. https://www.imwa.info/docs/imwa_2024/IMWA2024_Hedin_264.pdf

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Research

GEOPHYSICAL IDENTIFICATION OF POTENTIAL GROUNDWATER-SURFACE WATER INTERACTIONS IN THE BONITA PEAK MINING DISTRICT, SAN JUAN COUNTY, COLORADO
Werkema, D., N. Terry, M. Briggs, E. Rutila, and S. Dyment. EPA/600/R-24/007, 59 pp, 2025.

This report presents results and interpretation of geophysical investigations to aid in the location, identification, and development of a conceptual site model (CSM) for the near-surface groundwater and surface water hydrology of the Upper Cement Creek and California Gulch of the Animas Rivers within the Bonita Peak Mining District (BPMD). Mine-influenced water (MIW) from numerous mine adits has altered the geochemistry and ecology of these ground and surface waters. Two field deployments were completed. Phase 1 was completed using multifrequency electromagnetic induction (EMI) and thermal infrared imaging (TIR) to measure the bulk electrical conductivity, magnetic susceptibility, and the temperature response at known and suspected groundwater seeps into the Upper Cement Creek and California Gulch stretches of these alpine streams. Results and interpretation identified stretches of the streams for detailed fiber optic distributed temperature system (FODTS) monitoring of the temperature dynamics for sub-meter identification of potential groundwater-surface water interactions during Phase 2. Phase 2 included additional EMI, FODTS, and some Phase 1 repeat measurements for improved data quality. Results from both phases interpreted in concert with the synoptic geochemical sampling (USGS data release: https://www.sciencebase.gov/catalog/item/5f18a30082cef313ed84879b) event during Phase 2 provided detailed near-surface electrical conductivity and magnetic susceptibility mapping, discrete TIR imaging, and several kilometers of FODTS data. Data were georeferenced and used to identify potential groundwater seeps. Results reveal a very complex near-surface geology and hydrogeology regime. Seeps are classified and spatially correlated to the EMI, TIR, and geochemical sampling results. The data alone should not be used for final interpretations of the complex hydrogeology within these alpine systems. Rather, they should be combined with other data from various investigations to further refine the CSM and guide decisions for future investigations, watershed protective measures, and other site decisions. https://cfpub.epa.gov/si/si_public_record_report.cfm?dirEntryId=364273&Lab=CEHEA&simplesearch=0&showcriteria=2&sortby=pubDate&timstype=&datebeginpublishedpresented=05/15/2019&searchall=remediation+

ENVIRONMENTAL EFFECTS OF ACID MINE DRAINAGE AND REHABILITATION OPTIONS AT CLOSED MINE SITE: A CASE STUDY
Konanc, M.U. and Gokce Didar Degermenci.
Environmental Geochemistry and Health 46:509(2024)

A study analyzed soil, water, and sediment samples taken from a copper mining site to evaluate the concentrations and effects of trace elements released into the environment by mining activity. Acidic mine drainage (AMD) was the main cause of the high concentrations of trace elements in the soil and sediments, including arsenic, cadmium, lead, and copper. The concentrations of As, Cd, Pb, and Cu in soil and sediments were 2,734 times, 1,189 times, 157 times, and 32 times higher, respectively, than the average background concentrations of these elements in the upper crust. Geological and statistical studies indicate that the primary constituents of these pollutants are chalcopyrite and pyrite derivatives present in the primary rock structure. The release of essential trace elements into water was investigated using water analysis data from 2011 to 2020 to monitor the environmental effects of AMD from the closed Kuvarshan copper mine in the Artvin region of Turkey. The study demonstrates that trace element concentrations may change according to local and seasonal factors and highlights the importance of conducting routine environmental monitoring studies.

AMENDMENTS PROMOTE DOUGLAS-FIR SURVIVAL ON FORMOSA MINE TAILINGS

Johnson, M.G., D. Olszyk, M. Bollman, M.J. Storm, R.A. Coulombe, M. Nash, V. Manning, K. Trippe, D. Watts, and J. Novak. I Journal of Environmental Quality 53(5):553-564(2024)

This paper describes a case study at the Formosa Mine in Douglas County, Oregon, where tailings were amended with a mixture of lime, biosolids, biochar, and microbial inoculum to facilitate establishment of Douglas-fir (Pseudotsuga menziesii [Mirbel] Franco) seedlings. The tailings pH increased, and Douglas-fir seedlings survived and grew with these amendments. After 2 years, pH decreased in some downslope locations and was associated with an increase in tree mortality. This suggests that tailings conditions should be monitored and amendments reapplied as needed, particularly in areas receiving acidic runoff from unamended upslope tailings, until the seedlings are fully established.

A DECADE-LONG JOURNEY SHED LIGHT ON CHEMICAL COMPOSITION AND FIELD DETERMINATION OF ACID MINE DRAINAGE IN BRAZIL

Cardoso, A.T., F.M. Fan, and A.P. Viero.
Environmental Monitoring and Assessment 196:123(2024)

An environmental monitoring database from watersheds impacted by coal mining in Brazil was used to analyze the relationships between physical properties and constituents from different water sources affected by acid mine drainage (AMD). Samples were grouped into four categories based on location and contamination levels. Water samples from the two groups not affected by AMD exhibited near-neutral pH, low metal and sulfate concentrations, and a large portion of samples below the quantification limit for Mn and Al. In contrast, samples from groups affected by AMD displayed high metal and sulfate concentrations and acidic pH, with the highest contamination observed in the underground mine discharges group. Spearman correlation analyses between field (pH and electrical conductivity) and lab (SO_4^{2-}, Fe, Mn, and Al) parameters showed no significant correlations in non-AMD-affected groups but significant correlations in AMD-affected groups, particularly the Streams group. A regression model between sulfate and EC was identified as the best predictor for AMD, enabling continuous, low-cost monitoring of contaminated streams and providing insight into previously unobserved AMD processes, such as variations in contamination during storm events and river flushing.

REUSE OF MINE TAILINGS AS AN ALTERNATIVE FOR THE MANUFACTURE OF REFRACTORY BRICKS: SUSTAINABLE REMEDIATION FOR MINING WASTE MANAGEMENT

Puy-Alquiza, M.J., M.C. Gonzalez, R. Miranda-Aviles, J.M. Palmerin, M.M. Salazar-Hernandez, and C.D.M. Sanchez. I Remediation 35(1):e70004(2024)

This article proposes an engineering application to manufacture refractory blocks from mine tailings for use in the domestic or construction sectors. The physical, mechanical, and chemical properties of the blocks were evaluated to determine their composition and behavior. Subjecting tailings blocks to temperatures of 1,200°C resulted in an acid-type refractory brick, high-density refractory brick (2.4 g/cm^3), with a porosity of 43%, to 24 hardness (474-468 HLD), absorption (28.6%-5.7%), smooth and homogeneous texture, and resistant to corrosion by acids. The refinery bricks exhibited a mechanical resistance of 50.57-181.66 MPa, flexion resistance of 2.93-13 MPa, and thermal expansion of 0.17 mm. A detailed study, involving field analysis, X-ray diffraction analysis, X-ray fluorescence analysis, and morphometric analysis using a petrographic microscope and scanning electron microscopy was conducted to better understand the textural and chemical characteristics of the material. Regarding the chemical composition, the bricks have high SiO_2 (80.6%), CaO (6.65%) and Al>sub>2O_3 (6.0%) content. The mineral phases consist of quartz β, cristobalite, and opal, designating the blocks as acid-refractory brick. Acid-refractory bricks obtained from mining tailings represent an option to reduce waste in the environment and provide an alternative as a raw building material in the domestic and industrial sectors.

BASED ON THE PRODUCTION OF ECOLOGICAL BRICKS

da Silva, H.E. and N.R.A. Filho. I Remediation 35(2):e70012(2025)

A new composite material with appropriate technical properties, such as compressive strength and water absorption, was developed to remediate waste materials (iron ore tailings, polyester fabric waste, and PET plastic waste) and reduce environmental liabilities. Two types of ecological bricks were produced, one of them combining iron ore tailings and polyester fabric wastes, and the other combining iron ore tailings and PET plastic wastes. Both bricks were evaluated for the construction of social housing. Results show that these bricks are similar to soil-cement bricks, with which windbreak walls and walls of residential buildings can be built, supporting all loads for a Brazilian housing project. The development of the ecological bricks reduces the consumption of virgin raw materials, normally removed from the environment, in addition to reducing the release of the waste materials into the environment.

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General News

REUSE OF SOLID MINING WASTE

Interstate Technology & Regulatory Council (ITRC) Web-based document mw-1, 2024

ITRC's new guidance, Reuse of Solid Mining Waste, is designed to help determine appropriate uses for solid mining waste. Solid mining waste represents a significant quantity of waste material worldwide that has a range of physical and chemical properties making them both potentially valuable and potentially hazardous to human health and the environment. The training and guidance document is geared towards state regulators and environmental consultants, mining and manufacturing stakeholders, community and tribal stakeholders, and others with an interest in the potential reuse of solid mining waste. The guidance includes:

- Introduction to mining wastes
- Considerations for reusing mining waste: waste characterization, economic and market considerations, life cycle and risk assessment, regulatory considerations, & stakeholder considerations
- Potential applications for the reuse of solid mining waste: examples of construction, environmental, and industrial reuses
- Review of technologies used in mineral beneficiation and processing

The guidance also includes several case studies illustrating a range of current mining waste reuse scenarios. https://mw-1.itrcweb.org/

SEMI PASSIVE WATER TREATMENT USING ANIONIC POLYACRYLAMIDE FLOCCULANT LOGS

Bray, S.I. I British Columbia 47th Mine Reclamation Symposium, 23-26 September, Burnaby, British Columbia, 12 pp, 2024

This review introduces anionic polyacrylamides (aPAMs) technologies and their treatment capability to illustrate how to successfully decrease concentrations of metals, total suspended solids, and general turbidity to manage effluents from industry and mining. The versatility of anionic polymer flocculants makes them attractive and ideally suited for reducing effluent in construction and mining and for use in remote and extreme conditions. https://open.library.ubc.ca/media/download/pdf/59367/1.0447206/3

IMPLEMENTATION OF SWAMPY FOREST SYSTEM FOR ACID MINE DRAINAGE TREATMENT TO MEET THRESHOLD VALUE

Noor, I., Y.F. Arifin, B.J. Priatmadi, and A.R. Saidy.
E3S Web of Conferences 485:03005(2024)

A novel swampy forest system was developed to overcome the weaknesses of conventional processing by naturally responsive mitigation, reducing cost and speed, resulting in greater capacity for acid mine drainage (AMD) treatment. The swampy forest system implemented in coal mining relies on empty fruit bunches as organic matter, grass, and selected tree species planted in the treatment pond. The system effectively changes the noncompliance parameters of wastewater when entered at the system's inlet to meet the threshold value after processing. https://www.e3s-conferences.org/articles/e3sconf/pdf/2024/15/e3sconf_etmc2024_03005.pdf

APPLYING MINE ENGINEERING PRACTICE INTO RECLAMATION OF MINE ROCK SPOILS

Mitchell, J. and D.J. Formanski. I British Columbia 47th Mine Reclamation Symposium, 23-26 September, Burnaby, British Columbia, 12 pp, 2024

This paper describes methods where mine engineering practice benefits landforming of mine rock spoils (MRS). The methods both incorporate the knowledge of mine reclamation experts and utilize mine engineering experience. Results are realized before MRS construction, while planning reclamation and during reclamation of MRS. Mine engineering principles enable the efficiency and optimization necessary to accelerate mine reclamation and support sustainable resource development.
https://open.library.ubc.ca/media/download/pdf/59367/1.0447213/3

ASSESSING PHYTOREMEDIATION STRATEGIES FOR GOLD MINE TAILINGS: A BIBLIOMETRIC AND SYSTEMIC REVIEW

Putra, B., M. Surachman, I.W.A. Darmawan, A. Fanindi, D. Sawen, R. Dianita, I.I. Praptiwi, K. Sawo, M. Hambakodu, B.T. Hariadi, B.B. Koten, S. Akhadiarto, S. Bahar, J. Sirait, J. Nulik, K. Simanihuruk, R.A. Gopar, and Suharlina.
Environmental Geochemistry and Health 47:12(2025)

A bibliometric and systematic review was conducted to evaluate the effectiveness of phytoremediation strategies in mitigating the environmental impacts of gold mine tailings. Forty-five research articles were selected and analyzed utilizing the PRISMA methodology, highlighting key trends and insights in phytoremediation research. The review spans over 20 years of research, with a notable annual growth rate of 2.8% and significant contributions from countries like Indonesia, Malaysia, and South Africa. Key findings emphasize the variability in phytoremediation success based on plant species, site conditions, and remediation techniques. Prominent plants identified include vetiver grass, Siam weed, and water hyacinth, all of which demonstrate significant potential for heavy metal uptake and soil stabilization. The study also underscores the importance of optimizing plant-microbe interactions and employing site-specific approaches to enhance remediation efficiency. Future research opportunities are also identified, with a focus on genetic engineering of plants, field trials, and integration of advanced monitoring technologies.