Technology Innovation News Survey

Entries for November 16-30, 2018

Market/Commercialization Information

UPPER SALMON BASIN HABITAT IMPROVEMENT PLANNING AND COORDINATION Department of the Interior, Bureau of Reclamation, Funding Opportunity BOR-PN-18-F033, 2018

The Lemih, Pathsimerol, and Upper Salmon rivers have been affected by legacy mining impacts, railroad construction, road construction, and agriculture. These anthropogenic influences, combined with out-of-subbasin sources of mortality, have resulted in high-risk findings for several varieties of salmon. The Bureau of Reclamation invites applicants to submit proposals that will build on the recently completed Integrated Rehabilitation Assessment (IRA) document. At Mark 1990 (1990)

USACE CHICAGO DISTRICT BUSINESS OPPORTUNITIES OPEN HOUSE U.S. Army Corps of Engineers, USACE District, Chicago. Federal Business Opportunities, Solicitation W912P6-DistrictOpenHouse, 2019

The U.S. Army Corps of Engineers, Chicago District is hosting a Business Opportunities Open House on February 20, 2019, from 9 AM until noon at the Chicago District Office, 221 South LaSaile Street, 16th Floor, Chicago, IL 60604. Large and small firms, nonprofit agencies, higher education institutions, and partners are invited to attend to meet district paradination, program managers, project engineers, contracting, small business, and other district paradination, program managers, project engineers, contracting, small business, and other district paradination program managers, project engineers, contracting, small business, and other district paradination program managers, project engineers, contracting, small business, and other district paradination contracting small business, and other district paradination is needed. There will be no seating and no presentations. Takets are unclearly and parameters, project engineers, contracting, small business, and other district paradination program managers, project engineers, contracting, small business, and other district paradination is needed. There will be no seating and no presentations. Takets are provided and parameters are interested in the program instructions in sneeded. There will be no seating and no presentations. Takets are provided and parameters are interested in the program instruction is needed. There will be no seating and and parameters are interested in the program instruction in the seating and the program instruction and presentations. The USACE is interested in meeting technically competent, responsible entities within a wide range of NAICS codes, among them 541300 (Engineering Services) and 54150 (Engineering Contracting Services) and 54150 (Engineering Services) and 54150 (Engineerin

Cleanup News

METAL MASS RETENTION IN PASSIVE TREATMENT SYSTEMS AT THE TAR CREEK SUPERFUND SITE

Nairn, R. 2018 National Meeting of the American Society of Mining and Reclamation, June 3-7, St. Louis, MO: The Gateway to Land Reclamation. 59 slides, 2018

The Tri-State Mining District (TSMD) was a major producer of lead and zince to the Use the Outertry to Law rectanized on constants of mining operations, mine voids filled with groundwater and several dozen artesian discharges of metal-contaminated waters began flowing in late 1979. U.S. EPA identified four TSMD-related CERCLA alses in Oklahoma, Kansas, and Missouri. Mine water discharges were especially pervasive in the TT Creek Superfund Site. Since 2008, two filled waters began flowing in late 1979. U.S. EPA identified four TSMD-related CERCLA alses in Oklahoma, Kansas, and Missouri. Mine water discharges were especially pervasive in the TT Creek Superfund Site. Since 2008, two filled site and contain concentrations of ecotoxic metals that meet receiving water in-stream criteria. Based on their annual retention date, these systems (FTS) have been instanded to avater in-stream criteria. Based on their annual retention date, these systems, if they continue to function as designed throughout their 20-yr design (FtC). (Journanot 20, Bratic Can, Bra

FORMER GALMOY MINES TAILINGS RESTORATION

Devoy, C., L. Wrong, and K. Collins. 11th ICARD IMWA 2018 Annual Conference, September 10-14, Pretoria, South Africa. IMWA Proceedings (Volume I):9-16(2018)

Galmoy Mines completed the restoration of a tailings management facility (TMF) by incorporating an integrated constructed wetland (ICW) and returning the site to a land use compatible with the surrounding countryside. The ICW also treated surface water runoff efficiently and created an enhanced environment for local and migratory bird species. The wetland system improved post-closure water quality. As the TMF remediation matures, annuonia is stabilizing in the revegetated constructed wetland (ICW) and returning the site to a land use compatible with the surrounding countryside. The ICW also treated surface water runoff efficiently and created an enhanced environment for local and migratory bird species. The wetland system improved post-closure water quality. As the TMF remediation matures, annuonia is stabilizing in the revegetated constructed wetland (ICW) and returning the site to a land use compatible with the surrounding countryside. The ICW also treated any system improved post-closure water quality. As the TMF remediation matures, annuonia is stabilizing in the revegetated constructed wetland (ICW) and returning the site to a land use compatible with the surrounding countryside. The ICW also treated any system improved post-closure water quality. As the TMF remediation matures, annuonia is stabilizing in the revegetated constructed wetland (ICW) and returning the site to a land use compatible with the surrounding country system into a stabilizing in the revegetated constructed wetland (ICW) and returning the site to a land use compatible with the total stabilizing in the revegetated constructed wetland (ICW) and returning the site to a land use compatible with the total stabilizing in the revegetated constructed wetland (ICW) system within the TMF was the first project to complete mine closure activities under the EU Mining Waste Directive since its introduction in 2006. <a href="https://www.imwa.info/docs/imwa_2018/lbWA2018_lbwa2018_lbwa2018_lbwa2018_lbwa2018_lbwa2018_lbwa2018_lbwa2018_lbwa2018_lbwa2018_

THE FARO MINE LEGACY: 70 MILLION TONNES OF TAILINGS AND 320 MILLION TONNES OF WASTE ROCK

Bowie, A. 2018 Federal Contaminated Sites National Workshop, June 13-15, Toronto, Ontario. 13 slides, 2018

The Faro Mine footprint, which spans ~2,500 ha, includes an estimated 70 million tonnes of tailings and 320 million tonnes of waste rock. A significant amount of the waste has an acid generating potential that exceeds its acid neutralization capability. Uncertainties related to geochemical weathering and reactive transport of weathering products present challenges for long-term site management. The proposed stabilize-in-place approach will rely on diverting clean water; collecting and transfing contaminated water; reducing seepage through add-generating material by stabilizing and covering waste rock and tailings; and adaptively managing unacceptabile levels of contamination with downstrement. A freezing and ground ice formation, ground thawing and associated settlement, and freeze/(thaw cycling. Implementation of the closure plan is expected to state in 2022 and take ~15 years to complete. Sides:

FIRST FIVE-YEAR REVIEW REPORT HOLDEN MINE SITE OKANOGAN-WENATCHEE NATIONAL FOREST CHELAN COUNTY, WASHINGTON USDA, Forest Service, Pacific Northwest Region, 74 pp, 2018

The Holden Mine produced about 200 million lbs of C4, two million unces of Ag, and 600,000 ourses of Au from ~10 million tension of ore. Exception of 60 miles of underground turnels produced as 5 million tons of mill tailings placed of 90 at 55 f. Statistical as a will be as will be as will be as the complexity of th

EVALUATING PERFORMANCE OF COVER DESIGN FOR REMEDIAL OPTIONS ANALYSIS OF MINE CLOSURE, CANTUNG MINE, NWT

Kingston, S. and A. Hudson. 2018 Northern Latitudes Mining Reclamation Workshop, September 10-13, Whitehorse and Carcross, Yukon. 32 slides, 2018

The Cantung Mine site is located near the headwaters of the Flat River, ~300 km north of Watson Lake, just east of the Yukon border in the Northwest Territories (NWT). Tailings at the Cantung mine site are consistently classified as potentially acid generating with elevated metals content and are located in close proximity to the Flat Kiver channel. All of the containment dans for the five tailings ponds are constructed of local glacial till and alluvial materials constant and are located in close proximity to the Flat Kiver channel. All of the containment dans for the five tailings ponds are constructed of local glacial till and alluvial materials constant and are located in close proximity to the Flat Kiver channel. All of the containment dans for the five tailings ponds are constructed of local glacial till and alluvial materials constant with the structure of structure of the Structure and generation orses of the TPL/2 cover. The goal is to provide an analog for use in ofosing the currently uncovered TP3/4/5. Silicate minerals in the cover might be the controlling Factor in reactions tailing place in the cover. Slides: <u>https://www.y</u> Longer abstract: <u>htt</u>

Demonstrations / Feasibility Studies

REMEDIATION OF HISTORIC WASTE ROCK BY INJECTION OF GREEN LIQUOR DREGS: RESULTS FROM A FIELD SCALE TRIAL, GLADHAMMAR, SOUTHERN SWEDEN Sartz, L., S. Sadbom, and M. Backstrom. 11th ICARD INWA 2018 Annual Conference, September 10-14, Pretoria, South Africa. IMWA Proceedings (Volume II):1124-1129(2018)

Mining in Gladhammar, southern Sweden, started in the 15th century, generating waste rock containing copper, cobalt, and arsenic. During remediation in 2011, some waste rock was preserved, due to its geoscientific value, and placed on a geomembrane surface. Eventually, it became apparent that it had a substantial environmental impact (b) 45.0, U 96 mg/L, Co 21 mg/L). In 2017, green liquor dregs were injected to increase print determase trace dement mobility. Ten months after injection, the place of the standard surface and surfac

LIFE CYCLE IMPACT AND BENEFIT TRADEOFFS OF A PRODUCED WATER AND ABANDONED MINE DRAINAGE CO-TREATMENT PROCESS Wang, Y., S. Tavakkoli, V. Khanna, R.D. Vidic, and L.M. Gilbertson. Environmental Science & Technology 52(23):1395-14005(2018)

A process for combined treatment of two high-volume wastewater resources, produced water and mine drainage, has been developed and demonstrated at pilot scale to aid in management of wastewater resources in Pennsylvania. Co-treating mine drainage and produced water can be beneficial because, while the chemical composition of each fluid varies from site to site, the two by-products share opposite amounts of barium and sulfates that can be removed via precipitation when combined. The resulting fluid can be used to replace freshwater in future fracking operations, while the barite produced by the process can be used in drilling operations. Primary tradeoffs include co-treatment process environment. Electricity use was found to be the dominant contributor to all impact categories. See a report on earlier work on AMD/process water co-treatment at <u>bits</u>; View was to gravitational transperies to the arter or treatment at <u>bits</u>; View was to gravitationable management. Flowback-water curring utiquid: <u>cravitangement at bits</u>; View was to gravitationable management. Flowback-water curring utiquid: <u>cravitangement at bits</u>; View was to gravitationable management. Flowback-water curring utiquid: <u>cravitangement at bits</u>; View was to gravitationable management. Flowback-water curring utiquid: <u>cravitangement at bits</u>; View was to gravitationable management. Flowback-water curring utiquid: <u>cravitangement at bits</u>; View was to gravitationable management. Flowback-water curring utiquid: <u>cravitangement at bits</u>; View was to gravitationable management. Flowback-water curring utiquid: <u>cravitangement at bits</u>; View was to gravitationable management. Flowback-water curring utiquid: <u>cravitangement at bits</u>; View was to gravitationable management. Flowback-water curring utiquid: <u>cravitangement at bits</u>; View was to gravitationable management. Flowback-water curring utiquid: <u>cravitangement at bits</u>; View was to gravitationable management.

A PILOT OPTIMIZATION OF SULPHATE PRECIPITATION IN THE HIGH-DENSITY SLUDGE PROCESS Aube, B., M. Lamares, and S.L. Sang. 11th ICARD INWA 2018 Annual Conference, September 10-14, Pretoria, South Africa. IMWA Proceedings (Volume II):971-976(2018)

REAL-TIME ENVIRONMENTAL MONITORING OF MINING EFFLUENTS USING A MICROBIAL FUEL CELL (MFC) BASED SENSOR Adekune, A., V. Raghavan, and B. Tartakovsky. Abstract Book: Canadian Ectoracity Workshop, Vancouver, BC, 30 Sep - 3 Oct, 2018.

The study describes an environmental biosensor that exploits the high sensitivity of microbial fuel cells (MFCs) to variations in environmental conditions, such as the presence of electron donors and acceptors. The experiments established fast MFC voltage response to changes in mining water composition. MFC electrical performance could be inferred with the concentration of a target contaminant, thus enabling a low-cost and low-maintenance biosensor capable of detecting abrupt changes in environmental conditions. See *more on this study in A. Adekunds 2018 theirs at http://diatonal.iterary.rungil.ca/watery.rungil.ca/water/lear/biolegy/biolagape?pide 1610BScutstom at 72=direct.*

ON-SITE PILOT-SCALE DEMONSTRATION OF A LOW-COST BIOLOGICAL PROCESS FOR THE TREATMENT OF HIGH-SULPHATE MINE WATERS

Neale, J.W., M. Gericke, and R. Muhlbauer. 11th ICARD IMWA 2018 Annual Conference, September 10-14, Pretoria, South Africa. IMWA Proceedings (Volume I):164-170(2018)

The study describes the commissioning and operation of a pilot-scale passive biological sulfate reduction (BSR) process to treat mine-impacted water from a South African coal mine. The pilot plant comprises three 7 m³ reactors with a nominal feed rate of 245 L/d. The substrate comprises woodchips, wood shavings, hay, lucerne, and cow manure. Process performance is evaluated relative to influent pH level, hydraulic residence time, ambient temperature variations, and substrate complexity and the substrate comprises woodchips. Wood shavings, hay, lucerne, and cow manure. Process performance is evaluated relative to influent pH level, hydraulic residence time, ambient temperature variations, and substrate reglenishment trate. Early results demonstrate info/Localiuma. 2018/JIMBURG. 2018 Level. 164. pdf

OPERATIONAL-SCALE DEMONSTRATION OF PROPAGATION PROTOCOLS AND COMPARATIVE DEMOGRAPHIC MONITORING FOR REINTRODUCING FIVE SOUTHEASTERN ENDANGERED AND AT-RISK PLANTS Hohmann, M.G. and W.A. Wall. ESTCP Project RC-201201, ERC/CERL TR-18-1, 141 pp, 2018

The overall objective of this project was to increase the diversity and success of rare-plant conservation strategies available to managers. An operational-scale demonstration was executed of recently developed protocols for propagating and reintroducing one endangered and four at-risk plant species found on multiple southeastern installations. Over 3 consecutive yrs, 6,075 transplants of different age/size classes of each species were propagated and out-planted to four sites. Monitoring of survivorship, growth, and reproduction of these out-plants and more than 1,500 individuals in natural populations was conducted over four yrs. Demographic matrix modeling, life-table response experiments, and generalized linear models were used to compare the vital rates of the different classes and population growth rates between the natural and reintroduced populations. https://www.secuti.ex/ontent/downland/1425/142564371/life/CT-01118/bit.nei/a/2018/bit.nei/a/2018/bit.as

Research

HYDROLOGY-BASED DESIGN OF GEOMORPHIC EVAPOTRANSPIRATION COVERS FOR RECLAMATION OF MINE LAND Zhang, Z.F., N. Bugosh, T. Tesfa, M. McConald, and J. Kretzmann. 35th Annual Meeting of the American Society of Mining and Reclamation, June 3-7, St. Louis, MO: Reclamation. 25 slides, 2018

GeoFluv[™], a specific geomorphic grading design method, uses natural analogs for post-mining landscapes and design input values taken from stable natural landscapes to make a reclamation design that provides hydrological function, supp ecosystem integrity, and is cost-effective, sustainable, and more visually attractive. It can produce surface runoff water quality equal to or better than adjacent undisturbed lands and has been used for disturbed lands. To enhance storage

capacity, a capillary break can be added beneath the storage layer. A conceptual design study was carried out based on an abandoned mine site near Raton, New Mexico, to demonstrate that superior covers can be designed by integrating geomorphic grading and an evapotranspiration (ET) cover as a geomorphic ET (GET) cover. The overall shape of the GET cover can mimic the natural topography of the surrounding area, while the thickness and layering of the cover can be designed during GET cover design so that the post-reclamation groundwater flow is managed to meet the water quality standards. Longer abstract <u>https://www.astrustPartickMetines/DIRCPLana-WAA-SARk-httpart</u> ndf

EXPERIENCES WITH AUTONOMOUS SAMPLING OF PIT LAKES IN NORTH AMERICA USING DRONE AIRCRAFT AND DRONE BOATS Castendyk, D., B. Hill, P. Filiatreaut, B. Straight, A. Alangari, P. Cote, and W. Leishman. 11th ICARD IMWA 2018 Annual Conference, September 10-14, Pretoria, South Africa. 1MWA Proceedings (Volume II):1036-1041(2018)

Autonomous drones have created opportunities for pit lake monitoring. This paper reviews two water sampling programs conducted on pit lakes in North America since 2017 using unmanned aircrafts and boats. One study connected an off-the-shelf unmanned aerial vehicle to a commercial sample bottle and collected samples as deep as 80 m from seven pit lakes. Another used a custom-built drone boat to measure physiochemical profiles and take samples are deep as 80 m from seven pit lakes. Another used a custom-built drone boat to measure physiochemical profiles and take samples from the Berkeley Pit. http://unwa.jndk/got/unwa.2018/INMA02018.Castendyk.1036.odf

BACTERIAL COMMUNITY ANALYSIS OF STABILIZED SOILS IN PROXIMITY TO AN EXHAUSTED MINE Park, J.E, B.-T. Lee, B.-Y. Kim, and A. Son. Environmental Engineering Research 23(4):420-429(2018)

A recently stabilized site in the proximity of an exhausted mine was analyzed for bacterial diversity, richness, relative abundance, and the effect of environmental factors, Results showed that the stabilized layer exhibited lower bacterial diversity than control soils. The prevalence of forminant bacterial populations was examined in a hierarchical manner. Relatively high abundances of *Proteobacteria* and *Methylobacter (undropsludging)* were observed in the stabilized soil. In a diversity than control soils. The prevalence of *Control and Methylobacter (undropsludging)* were observed in the stabilized soil. In the understand and post-management of stabilized soils. The understand the ending of the understand and post-management of stabilized soils. The understand the ending of the unde

MINE DESIGN FOR IN SITU CONTROL OF SELENIUM AND NITRATE Jensen, S., J. Foster, M.-C. Noel, and M. Bartlett. 11th ICARD IMWA 2018 Annual Conference, September 10-14, Pretoria, South Africa. IMWA Proceedings (Volume 1):518-523(2018)

An approach is described for designing and developing a coal project for in situ control of selenium and nitrate in contact water from the mine as an alternative to engineered water treatment plants. The design integrates water management, pit design, and sequencing such that completed open pits can be backfilled and used as in situ bioreactors for attenuating selenium and nitrate. The attenuation process is well established and proven at different scales but the hydraulic design of the backfilled pit and operational control of carbon dosing can be developed most effectively in phased field tests done concurrently with full-scale design. Juins://www.imws.imwoir.imm.org/11/JI/Water and the selence of the dost field to the selence of the concernent with full-scale design. Juins://www.imws.imm.org/11/JI/Water and the selence of the dost field to the selence of the concernent with full-scale design. Juins://www.imws.imm.org/11/JI/Water and the selence of the dost field to the selence of the concernent with full-scale design. Juins://www.imws.imm.org/11/JI/Water and the selence of the dost field to the dost field to

NUMERICAL PREDICTION OF THE LONG-TERM EVOLUTION OF ACID MINE DRAINAGE AT A WASTE ROCK PILE SITE REMEDIATED WITH AN HDPE-LINED COVER SYSTEM Ramasamy, M., C. Power, and M. Mkandawire. Journal of Contaminant Hydrology 216:10-26(2018)

This study assessed the long-term effectiveness of an HDPE-lined cover system for reducing acid mine drainage (AMD) contamination at WRP sites via numerical investigation. 3D groundwater flow and contaminant transport model of the site was developed to predict the spatial and temporal evolution of AMD over 100 yrs. Field parameters observed at 46 monitoring wells over a 5-yr monitoring period were used as key input and calibration parameters. The HDPE cover significantly evidence to the waster encharge to the waster encharge to groundwater. Both the groundwater flow and contaminant transport model of the site week enclosed and emforts of the most enclosed and PMD exequel to groundwater. Both the groundwater flow and contaminant transport components of the model were calibrated and verified leid data, with evidence to the waster enclose to the observed and similated hydraulic heads and sulfate concentrations, respectively. Long-term model predictions of AMD evolution indicated significant and continual reductions in sulfate concentrations over time at all well locations. Background concentration levels are expected to be reached within 40 years.

REVIEW OF CONSTRUCTED WETLANDS FOR ACID MINE DRAINAGE TREATMENT Pat-Espadas, A.M., R.L. Portales, L.E. Amabilis-Sosa, G. Gomez, and G. Vidal. Water 10:1685(2018)

SULFATE-REDUCING BACTERIA AS AN EFFECTIVE TOOL FOR SUSTAINABLE ACID MINE BIOREMEDIATION Ayangbenro, A.S., O.S. Olanrewaju, and O.O. Babalola. Frontiers in Microbiology 9:1986(2018)

This review describes how microorganisms can be used to detoxify, extract, or sequester pollutants from mine waste. Sulfate-reducing microorganisms play a vital role in the control and treatment of mine waste, generating alkalinity and neutralizing the acidic waste. The design of engineered sulfate-reducing bacteria consortia will be an effective tool in optimizing degradation of acid mine tailings waste in industrial processes. https://www.mor/antice/BM/0131331/ndfbinch_09.11988.pdf

SHORT-TERM MICROBIAL EFFECTS OF A LARGE-SCALE MINE-TAILING STORAGE FACILITY COLLAPSE ON THE LOCAL NATURAL ENVIRONMENT Garris, H.W., SA. Baldwin, J. Taylor, D.B. Gurr, D.R. Denesiuk, J.D. Van Hamme, and L.H. Fraser. PLoS ONE 13(4):article e0196032(2018)

To investigate the impacts of the Mount Polley tailings impoundment failure on chemical, physical, and microbial properties of substrates within the affected watershed, a biomonitoring network was established two months following the disturbance to evaluate riparian and wetland substrates for microbial community composition and function via 165 and full metagenome sequencing. A total of 234 samples were collected from substrates as 30, 752 sequences were recorded in a geodatabase framework. Substrates associated with the impact zone were distinct chemically as indicated by elevated ph, intrafe, and sufface. The most limpact area (a 6-thm strate connecting two lakes) exhibited 30% lower incrobial diversity relative to the remaining sites. Field experimentation is underway to evaluate the potential for biostimulation and biomagnification to promote beneficial microbial activity in the deposited diversity.

HOW TO ASSESS POTENTIAL BIOLOGICAL EFFECTS OF SUBAQUEOUS DISPOSAL OF MINE TAILINGS: LITERATURE REVIEW AND RECOMMENDED TOOLS AND METHODOLOGIES

Campbell, P.G.C. and W.A. Price. Mine Environment Neutral Drainage Program, MEND Report 2.19.1, 158 pp, 2018

Subaqueous disposal (SAD) or flooding of sulfide-rich tailings in constructed facilities is a method used at some mine sites to mitigate the formation of acid mine drainage. The primary SAD mitigation mechanism is limitation of oxygen ingress into water-filled pores, which greatly reduces sulfide exidation, minimizes metal leaching, and prevents acidic drainage development. The overall biological performance of such facilities is not well understoad in particular, a major gap in understanding relates to the biological colonization of such facilities, the health of biological communities but are established, and the influence of those communities on water and sediment geochemistry. This report contains an introduction, an extensive literature review (Sections 2-7), and a set of recommendations on tools and methodologies that might be used to assess the biological effects of submerged tailings. http://medn.acid.meant.enatl.html.acid.enatl.html.acid.enatl.enatl.html.acid.enatl.enatl.html.acid.enatl.ena

PHYSICOCHEMICAL COMPOSITION OF WASTES AND CO-LOCATED LANDSCAPE DESIGNATIONS AT LEGACY 1 MINE SITES IN SOUTH WEST ENGLAND AND WALES: IMPLICATIONS ON RESOURCE POTENTIAL Crane, R., D.E. Sinnett, P.J. Cleall, and D.J. Sapsford. Resources, Conservation and Recycling 123:117-134(2017)

The potential for resource recovery and/or remediation of metalliferous mine wastes in southwest England and Wales was based on an assessment of the physicochemical composition of several key metalliferous legacy mine waste piles and an analysis of their co-location with cultural, geological, and ecological designations. The majority of the 14 sites studied contain relatively high concentrations of metals and metalloids, including Cu, Zn, As, Pb, Ag and Sn, many of which ecological and human health risk guideline concentrations. The economic value of metals in the waste potentially could be used to offset rehabilitation costs. About 70% are co-located with a least one cultural, geological, and ecological designations. This co-location with designations related to their mining activities—due ther to historical significance, rare species assemblages, or geological characteristics—demonstrates the need to consider the cultural and environmental impacts of rehabilitation and the constrate with the significance of the cultural and environmental impacts of rehabilitation and the standard of the cultural and environmental impacts of rehabilitation and the standard of the cultural and environmental impacts of rehabilitation and the standard of the cultural and environmental impacts of rehabilitation and the standard of the cultural and environmental impacts of rehabilitation and the standard of the cultural and environmental impacts of rehabilitation and the standard of the cultural and environmental impacts of rehabilitation and the standard of the cultural and environmental impacts of rehabilitation and the standard of the cultural and environmental impacts of rehabilitation and the standard of the cultural and environmental impacts of rehabilitation and the standard of the cultural and environmental impacts of rehabilitation and the standard of the cultural and environmental impacts of rehabilitation and the standard of the cultural and environmental impacts of rehabilitation and the standard of the cultural and env

LANDSCAPE AS A NETWORKED ECOLOGICAL SYSTEM: THE ROLE OF DATA AND EMERGING TECHNOLOGIES IN RETHINKING SITE REMEDIATION Ghandi, M. Journal of Digital Landscape Architecture 2:174-189(2017)

This paper examines the use of data-driven and parametric processes in designing adaptive networked ecological systems as presented and illustrated in two case studies: one of brownfields in the San Francisco bay area and the other of mining sites in Latrobe, Australia. Both areas are deterior and inpact another of industrialization. The two projects illuminate several areas in which landscape design can be successfully supplemented by contempor data systems they provide region. Single design and impact another services and industrialization. The two projects illuminate several areas in which landscape design can be successfully supplemented by contempor data systems they provide region. Single design and impact another services and relative scale design can be successfully supplemented by contempor data systems the region of the systems and the services and the services and the design can be successfully supplemented by contempor data systems the region of the service and the service and the services and the design can be successfully supplemented by contemport data systems the region of the service and the ser

INTEGRATED HYDROLOGICAL AND GEOPHYSICAL CHARACTERISATION OF SURFACE AND SUBSURFACE WATER CONTAMINATION AT ABANDONED METAL MINES Hudson, E., B. Kulessa, P. Edwards, T. Williams, and R. Walsh. Water, Air, & Sul Pollution 223:256(2018)

The mining and processing of metal ores at Esgair Mwyn, an abandoned mine in Ceredigion, Wales, UK, has left a legacy of environmental degradation. Flow gauging, water quality, and geophysics were combined in an integrated assesses of surface and subsurface hydrological contamination at the site. Heavy metals are affecting downstream watercourses, leading to widespread Environmental Quality Standards compliance failures. Through salt water during and processing of surface hydrological contamination at the site. Heavy metals are affecting downstream watercourses, leading to widespread Environmental Quality Standards compliance failures. Through salt water during and processing and a seepage place within the failings lagoon value, while the main tallings heap wells, while the main tallings heap wells, while the main tallings heap wells are affecting downstream became increasingly subtracted with depth. A large a diacent field adjacent field and bad a high potential to convert pollutants in spotton, yet is assessment approach provides a cost-effective way to identify the origins and pathways of contaminants and inform mitigation strategies focused on containment. This paper is **Open Access at https://integraticle/10.1007/s11270-118-2880-4**.

BIODIVERSITY VARIATION AND CHANGE ON A COMPLEX COASTAL PLAIN LANDSCAPE: CAUSES, CONNECTIONS, CONSEQUENCES, AND RECOMMENDATIONS FOR ECOSYSTEM RESTORATION AND CONSERVATION DE LA COMPLEX COASTAL PLAIN LANDSCAPE: CAUSES, CONNECTIONS, CONSEQUENCES, AND RECOMMENDATIONS FOR ECOSYSTEM RESTORATION AND CONSERVATION DE LA COMPLEX COASTAL PLAIN LANDSCAPE: CAUSES, CONNECTIONS, CONSEQUENCES, AND RECOMMENDATIONS FOR ECOSYSTEM RESTORATION AND CONSERVATION DE LA COMPLEX COASTAL PLAIN LANDSCAPE: CAUSES, CONNECTIONS, CONSEQUENCES, AND RECOMMENDATIONS FOR ECOSYSTEM RESTORATION AND CONSERVATION DE LA COMPLEX COASTAL PLAIN LANDSCAPE: CAUSES, CONNECTIONS, CONSEQUENCES, AND RECOMMENDATIONS FOR ECOSYSTEM RESTORATION AND CONSERVATION DE LA COMPLEX COASTAL PLAIN LANDSCAPE: CAUSES, CONNECTIONS, CONSERVATION DE LA COMPLEX COASTAL PLAIN DE LA COMPLEX COMPLEX COASTAL PLAIN DE LA COASTAL PLAIN DE LA COMPLEX COASTAL PLAIN DE LA COMPLEX COASTAL PLAIN DE LA COASTAL PLAIN DE Cunningham, P. and N. Christensen. SERDP Project RC-2245, 34 pp, 2018

The 10-yr Defense Coastal/Estuarine Research Program (DCERP) research and monitoring project was designed to support ecosystem-based management on Marine Corps Base Camp Lejeune in North Carolina, with the overarching objective to maintain the area's natural resources. This report summarizes DCERP's terrestral ecosystem research and monitoring efforts to provide a uniform, geographically explicit database for plant species composition and abundance that will serve as the basis for assessing regional and site-specific changes in plant communities. This report also provides natural resources managers with a focused set of species and site indicators to facilitate future monitoring to assessimprotant changes in therestrial ecosystem health. Monitoring of plant communities is key to understanding possible local and landscape-level changes in habitat for species, such as the federally listed red-cockaded woodpecker. https://www.setd-estro.org/content/downlad/415314/3533/01/LEPO1245/01/LEPO12

FORECASTING LONG TERM WATER QUALITY AFTER CLOSURE: BOLIDEN AITIK CU MINE, SWEDEN McKeown, M., D. Christensen, S. Mueller, P. Weber, and M. O'Kane. 2018 Northern Latitudes Mining Reclamation Workshop, September 10-13, Whitehorse and Carcross, Yukon. 27 slides, 2018

The Boliden Attb Mine is located near Galivace, northern Sweden Evaluation of Journe Jian development for water guality enancting as iseal and toe sepage from the waste out storage facilities (URSE) was a key and the second storage facilities (URSE) was a key a Slides: https://www Longer abstract:

General News

GLOBAL COVER SYSTEM DESIGN: TECHNICAL GUIDANCE DOCUMENT International Network for Acid Prevention (INAP), 216 pp, 2017

Designed primarily for those investigating the use of cover systems on mine sites, this document offers a "best practice" summary to assist mine operators, designers, and regulators to address the role cover systems play over the life of mine, from early conceptualization to long-term performance monitoring. A conceptual model illuminates how cover system designs might affect contaminant and acidity loading. The model attempts to determine when the varying roles o cover system design (e.g., control of net percolation or oxygen ingress) might influence loadings. Acknowledgment of these unique relationships provides an opportunity to opportunity to optimize cover-effective management of metal loading and acid ro drainage. The cover system design to unique content (indicat-cover estimation) and acid in the cover system design attempt and the superior of the service and meet desired performance design citeria.

CANADA'S NATIONAL ORPHANED/ABANDONED MINES INITIATIVE: THE RETURN OF MINING LANDS PROJECT AND LOOKING TO THE FUTURE

AUSIMM Bulletin June: 38-40(2017)

Orphaned and abandoned mines are categorized as those mines for which the owner cannot be found or for which the owner is financially unable or unwilling to remediate the site. Canada's National Orphaned/Abandoned Mines Initiative (NOAMI) was created in 2002. NOAMI does not directly clean up orphaned and abandoned mine sites; instead, it examines the legislative, policy, and program framework in Canada for addressing issues associated with orphaned and abandoned mines and makes recommendations for improvement. A pan-Canadian effort, NOAMI has fulfilled its mandate for over 15 years and is an example of how a collaborative approach to the legacy of past mining practices can advance the objectives of sustainable development. This article highlights two of NOAMI's active projects. <u>http://www.ahandoned-mines.org/wn/wn-content/unloads/2017/11/NOAMI_1UN17-ALISIMM_Rulletin-2.ndf</u>

SPOIL TO SOIL: MINE SITE REHABILITATION AND REVEGETATION Bolan, N.S., M.B. Kirkham, and Y.S. Ok. CRC Press, Boca Raton, FL. ISBN: 9781989767613, 371 pp, 2017

This text presents both fundamental and practical aspects of remediation and revegetation of mine sites. Arranged in three major themes, the chapters examine characterization of mine site spoils; remediation of chemical, physical, and biological constraints of mine site spoils, including post mine-site land-use practices; and revegetation of remediated mine site spoils. Case studies involving successful rehabilitation of mine sites around the world are featured in the final section. *View table of contents* zathers zathers zathers. *Viewawccreesscom/Sonit-To-Sonit-Mine-Site-Erabilitation* and *Revegetation/Rolan-extens*

RETHINKING MINE REMEDIATION: COMMUNITY ENGAGEMENT IN MINE CLOSURE Beckett, C. and A. Keeling. 2018 Northern Latitudes Mining Reclamation Workshop, September 10-13, Whitehorse and Carcross, Yukon. 16 slides, 2018

Can the current approach to mine remediation be changed from a focus on site containment to a broader emphasis on community remediation, reclamation, repair and reconciliation? The Giant Mine and Cyprus Anvil Mine cases illustrate the potential for community activism to shift remediation to include social issues such as environmental justice, reconciliation, and intergenerational equity. This presentation aims to contribute to a broader understanding of the social dimensions of toxic contamental justice. The Control of the social dimensions of the social dimensions of the social dimensions of the social dimensions of the control of the social dimensions. Slides: <u>https://www.ukonmineers.org/index.pho/presentations/44-heckett-rativon-retrinking-mine-remediation/file</u>

METHODS FOR ASSESSMENT OF SPECIES RICHNESS AND OCCUPANCY ACROSS SPACE, TIME, TAXONOMIC GROUPS, AND ECOREGIONS: FIELD GUIDE AND NATURAL HISTORY OF BUTTERFLIES ON THE WESTERN EDGE OF THE GREAT BASIN Fleishman, E. and F. Fogarty. SERDP Project RC-2202, 90 pp. 2018

This field guide and natural history was written to share information on the ecology and identification of the species of butterflies that the data suggest regularly breed or occur on DoD lands and ecologically similar areas on the western edge of the Great Basin (California/Nevada border). https://www.serdn-estrp.org/content/download/47398/452217/file/RC-2202%20Eield%20Guide%2013.ndf

ENGAGING STAKEHOLDERS IN NATURAL RESOURCE DECISION-MAKING Crawford, B.A., R.A. Katz, and S.K. McKay. ERDC/TN EMR/RS-SR-83, J5 pp, 2017

Participatory decision-making hinges on stakeholder engagement—a process that includes fostering a shared understanding of the issue, stakeholder buy-in, and co-creation of solutions as an effective means to address an issue. Although many resources have described effective methods for initiating the process of stakeholder engagement, which often presents a hitting the process of stakeholder engagement, which often presents a hitting the process of stakeholder engagement, which often presents a hitting the process of stakeholder engagement, which often presents a hitting the process of stakeholder engagement, which often presents a hitting the process of stakeholder engagement, which often presents a hitting the process of stakeholder engagement, which often presents a hitting the process of stakeholder engagement, which often presents a hitting the process of stakeholder engagement, which often presents a hitting the process of stakeholder engagement, which often presents a hitting the process of stakeholder engagement, which often presents a hitting the process of stakeholder engagement.

ABSTRACT BOOK: 45TH ANNUAL CANADIAN ECOTOXICITY WORKSHOP, VANCOUVER, BC, SEPT. 30 - OCT. 3, 2018 CEW Organizing Committee, 178 pp, 2018

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 <u>datam michaelebrano</u> or (073) 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.