

TECHNICAL LIBRARY

October 9, 2009

Current Journal Contents

of the

OSM-WR Technical Library

1999 Broadway, Suite 3410

P.O. Box 46667

Denver, CO 80201-6667

This is the current compilation of the table-of-contents pages for journals received during the month of September in the Library. Individuals may have copies of specific articles by notifying the librarian either by phone, e-mail, or regular mail service. **(If you have more than one or two articles you want, please send a written or e-mail request.)**

Deborah K. McGinnis, Librarian

Tele: (303) 293-5073

FAX (303) 293-5017

E-mail: dmcginnis@osmre.gov

OSM Library Catalog: <http://www.wrcc.osmre.gov/glas/>

NOTICE OF WARNING CONCERNING COPYRIGHT RESTRICTIONS

The copyright law of the United States (Title 17, United States Code) governs the making of photocopies or other reproductions of copyrighted material.

Under certain conditions specified in the law, libraries and archives are authorized to furnish a photocopy or other reproduction. One of these specific conditions is that the photocopy or reproduction is not to be "used for any purpose other than private study, scholarship, or research." If a user makes a request for, or later uses, a photocopy or reproduction for purposes in excess of "fair use," that user may be liable for copyright infringement.

This institution reserves the right to refuse to accept a copying order if, in its judgment, fulfillment of the order would involve violation of copyright law.

Table of Contents

Soil Quality & Fertility

- Soybean Yield and Soybean Cyst Nematode Densities Related to Soil pH, Soil Carbonate Concentrations, and Alkalinity Stress Index**
N. P. Rogovska, A. M. Blackmer, and G. L. Tylka 1019
- Organic and Mineral Input Management to Enhance Crop Productivity in Central Kenya**
P. Chivenge, B. Vanlauwe, R. Gentile, H. Wangeci, D. Mugendi, C. van Kessel, and J. Six 1266

Cropping Systems

- High Yielding Organic Crop Management Decreases Plant-Available but Not Recalcitrant Soil Phosphorus**
C. Welsh, M. Tonita, D. N. Platen, J. R. Thiessen-Martens, and M. H. Entz 1027
- Living Mulch Forage Yield and Botanical Composition in a Corn-Soybean-Forage Rotation**
Jeremy W. Singer, Keith A. Kohler, Kenneth J. Moore, and David W. Meek 1249

Cover Crops

- Cover Crop and Nitrogen Effects on Maize Productivity in No-Tillage Systems of the Brazilian Cerrados**
A. Maltas, M. Corbeels, E. Scopel, J. Wery, and E. A. Macena da Silva 1036

Waste Management

- Barley Yield and Nutrient Uptake for Soil Amended with Fresh and Composted Cattle Manure**
J. J. Miller, B. W. Beasley, C. E. Drury, and B. J. Zebarth . . . 1047

Phosphorus Management

- Growth and Phosphorus Uptake of Three Riparian Grass Species**
John L. Kovar and Norbert Claassen 1060
- Nitrogen Fertilization Effect on Phosphorus Remediation Potential of Three Perennial Warm-Season Forages**
Y. C. Newton, S. Agyin-Birikorang, M. B. Adjei, J. M. Schollberg, M. L. Silveira, J. M. B. Vendramini, J. E. Recheigl, and L. E. Soilenberger 1213

Site-Specific Analysis & Management

- Erosion Index Derived from Terrain Attributes using Logistic Regression and Neural Networks**
A. C. Pike, T. G. Mueller, A. Schoegendorfer, S. A. Shearer, and A. D. Karathanasis 1068
- Performance of Improved Cassava Genotypes for Early Bulking, Disease Resistance, and Culinary Qualities in an Inland Valley Ecosystem**
Richardson U. Okechukwu and Alfred G. O. Dixon 1258

Integrated Pest Management

- Soybean Aphid Population Dynamics, Soybean Yield Loss, and Development of Stage-Specific Economic Injury Levels**
Michael A. Carangui, Eric A. Beckendorf, and Walter E. Rudell 1080

Corn

- Zone Tillage Depth Affects Yield and Economics of Corn Silage Production**
William J. Cox, Jerome H. Cheney, and John H. Hancher 1093

Forages

- Cattle Manure Application Strategies Effects on Bahiagrass Yield, Nutritive Value, and Phosphorus Recovery**
A. K. Obour, M. L. Silveira, M. B. Adjei, J. M. Vendramini, and J. E. Recheigl 1099
- Potential for Delayed Orchardgrass Seeding during Glyphosate-Resistant Alfalfa Establishment**
Bryan L. Dilchay, William S. Curran, and Marvin H. Hall 1108
- No Persistent Changes in Pasture Vegetation or Seed Bank Composition after Fallowing**
Sarah Goslee, Matt Sanderson, and Jeffery Gonet 1168
- Preplant Herbicides Don't Increase Forage Production of Cereal Rye Interseeded into Bermudagrass**
Brandon Bruce, Robert L. Kallenbach, Kevin Bradley, and Ben Fuqua 1175
- Maximizing Timothy Forage Yield and Quality by Balanced Nitrogen, Phosphorus, and Sulfur Fertilization**
Sukhdev Singh Mallo, Bruce Coulman, and Jeffrey John Schoenau 1182

Covers: Map indicating the probability of finding an eroded waterway (probability values from 0.5 to 1.0 shown in orange indicate that erosion from concentrated flow is likely), observed eroded waterways (dashed lines), field border excluding buffer zones (solid line), and a detailed aerial imagery (2006 2-Meter NAIP Digital Ortho Photo Imagery) for Field D (see Pike et al., p. 1068–1070). The layers were draped over a USGS 10-m elevation model (5× vertical exaggeration, National Elevation Dataset). The probability map was calculated from terrain attribute data using Eq. [4] in the text. The manuscript describes how this work was confirmed using leave-one-field-out validation procedures. Image Credit: Tom Mueller and Adam Pike.

RECEIVED
2009 SEP 19 AM 10:30
JENNIFER COOPER
(cont.)

Pulse Crops

Seed Yield and Yield Stability of Chickpea in Response to Cropping Systems and Soil Fertility in Northern Latitudes
Y. Y. Gan, T. D. Warkentin, C. L. McDonald, R. P. Zentner, and A. Vandenberg 1113

Cotton

Cotton Planting Date: Yield, Seedling Survival, and Plant Growth
Donald J. Boquer and Ernest L. Clawson 1123

Impact of Varying Planting Dates and Tillage Systems on Cotton Growth and Lint Yield Production
William T. Pettigrew, W. T. Mohin, and S. R. Sretina 1131

Alfalfa

Plant Growth Regulator Effects on Balancing Vegetative and Reproductive Phases in Alfalfa Seed Yield
Tiejun Zhang, Xianguo Wang, Yunwen Wang, Jianguo Han, Peisheng Mao, and Mark Majerus 1139

Yields of Alfalfa Varieties with Different Fall-Dormancy Levels in a Temperate Environment
Chengzhang Wang, B. L. Ma, Xuebing Yan, Jinfeng Han, Yuxia Guo, Yanhua Wang, and Ping Li 1146

Soybean

Tocopherols Concentration and Stability in Early Maturing Soybean Genotypes
Philippe Seguin, Pierre Turcotte, Gilles Tremblay, Denis Pageau, and Wucheng Liu 1153

Turfgrass

Evaluation of Factors Contributing to Surface Stability of Sand-Based Turf
Deying Li, David D. Minner, and Nick F. Christians 1160

Intercropping

Canola-Wheat Intercrops for Improved Agronomic Performance and Integrated Pest Management
Jeremy D. Hummel, Lloyd M. Dossall, George W. Clayton, T. Kelly Turkington, Newton Z. Lupwayi, K. Neil Harker, and John T. O'Donovan 1190

Production Agriculture

Yield and Plant Growth Response of Peanut to Midseason Forage Harvest
Ronald B. Sorensen, Russell C. Nutt, and Christopher L. Butts 1198

Organic Production

Consequences of Conventional versus Organic Farming on Soil Carbon: Results from a 27-Year Field Experiment
Jens Leifeld, René Reiser, and Hans-Rudolf Oberholzer 1204

Disease Management

Evaluation of Maize Inbred Lines for Resistance to Aspergillus and Fusarium Ear Rot and Mycotoxin Accumulation
W. Brian Henry, W. Paul Williams, Gary L. Windham, and Leigh K. Hawkins 1219

P. Jof2

Crop Rotations

Alternative Crop Rotations under Mediterranean No-Tillage Conditions: Biomass, Grain Yield, and Water-Use Efficiency
Jorge Alvaro-Fuentes, Jorge Lampurlanés, and Carlos Cantero-Martínez 1227

Economic Analysis

Yield and Breakeven Price of 'Alamo' Switchgrass for Biofuels in Tennessee
Daniel F. Mooney, Roland K. Roberts, Burton C. English, Donald D. Tyler, and James A. Larson 1234

Modeling

Estimating Generic Coefficients for the CSM-CERES-Maize Model in North Carolina Environments
Zhengyu Yang, Gail G. Wilkerson, Gregory S. Buol, Daryl T. Bowman, and Ronnie W. Heiniger 1276

Integrated Agricultural Systems

Integrating Winter Annual Forages into a No-Till Corn Silage System
Giovani Stefani Paé, R. Mark Sulc, David J. Barker, Richard P. Dick, Maurice L. Eastridge, and Nicola Lorenz 1286

Other Items

ASA Statement of Ethics iv
Instructions to Authors v

Coal Age

RECEIVED

2009 SEP 23 PM 1:07

FEATURE ARTICLES

- 24 **Primary Coal Crushers Grow to Meet Demand**
Mine operators look for more throughput with less fines generation
- 28 **Slow Speed Object Detection for Haul Trucks**
Caterpillar integrates radar technology with its current camera-based system
- 34 **Dust Control for Draglines**
Monitoring dust levels inside draglines reveals room for improvement in how filtration systems are used and maintained
- 40 **Rend Lake College Celebrates the Opening of a New Coal Miner Trainer Facility**
The facility recently hosted the Illinois Mining Institute's annual conference and a regional miner rescue competition
- 44 **Bluefield Hosts Appalachia's Premiere Coal Show**
Despite the down economy, the Bluefield Coal Show is preparing for another successful event
- 54 **New Affordable Options for Infrastructure and Asset Protection**

COAL IN THE NEWS

- 6 **NRC report underscores key role of coal and CCS technologies in nation's energy future**
- 6 **Coal slated to roll along Montana rail line from Signal Peak mine**
- 7 **Western Energy will pay to settle coal royalties dispute**
- 8 **Virginia Tech and Marshall Miller take the lead on CCS proposal**
- 10 **NIOSH study finds legal coal dust levels increase risks of emphysema**
- 10 **Massey sees improvement in coke markets**
- 12 **Alpha donates to Mountain Empire Chapter of the American Red Cross**
- 16 **Coal transloader Kinder Morgan expands and enhances Midwestern terminals**
- 18 **WVU foresees "hydrogen highway" stop in Morgantown**
- 18 **CONSOL to expand coal slurry dam in West Virginia**
- 20 **Arch Coal donates to mining lab at Missouri S&T**

WORLD NEWS

- 7 **Canada's Teck reaches agreement on pricing**
Duke Energy teams with China Huaneng on clean energy
Xstrata plans to invest in South African projects
- 8 **Gujarat commissions longwall at Wongawilli**
Beijing closing coal plants in environmental move
- 12 **Indonesian coal output expected to increase**
Yanzhou coal makes bid for Felix Resources

NEWS/6
DENVER, COLORADO



SURFACE MINING/34



COAL MINER TRAINING/40



BLUEFIELD COAL SHOW/44



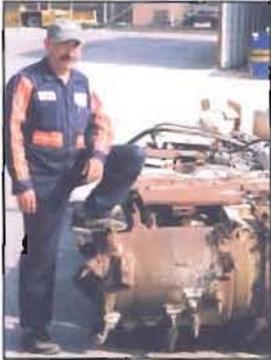
THIS ISSUE

This month, Coal Age highlights the Bluefield Coal Show, which will have plenty of equipment for low-coal applications. On the cover, a continuous miner operates a machine using remote control in a low-coal mine. (Photo courtesy of Lee Buchsbaum, www.lmbphotography.com)

DEPARTMENTS

- 4 Editorial
- 6 Coal in the News
- 7 World News
- 10 People
- 14 Dateline Washington
- 18 Calendar
- 20 Awards
- 54 Operating Ideas
- 56 Suppliers News
- 58 Product News
- 61 Classified
- 64 Legally Speaking

Features



**David Cline's
Rock and Roll Coal**
by Bill Archer

42



**Roy Smith
Honoring Those
Who Served**
by Art Sanda

54



**Randall Albert
Roots of CNX Gas
Tied to Coal**
by Bill Archer

60



**Kyle Hurt
Mefcor
Essentials**
by Bill Archer

62



**Judith La Marche
Leads the
La Marche Charge**
by Al Skinner

68

MSHA'S Meter is Running-Form 1000-179 10
by Justin Rubenstein

Cap-and-Trade, Limiting US Energy Production & Productivity 12
by Josh Geldrich

Coal People Rally to Save Jobs 16
Below the Radar.

Could That 3:00 a.m. Phone Call Have Been Avoided?... .. 18
by Kay Sever

Mine'ing Our Business 80

Departments

Buyer-Friendly Ad Index 6

Editorial by Al Skinner... .. 8

Coal People Comments... .. 15

Coal Events 21

Capsule News 72

Coal News Worldwide 75

Energy News 76

Coal People in the News 78

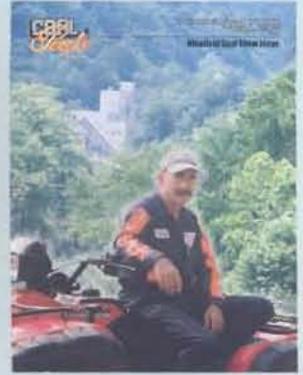
Product News 115

Advertising Index 122

Classified 117-121

Cover Photo

David Cline on his four-wheeler superimposed over a photo of the Alpha Natural Resources preparation plant on the Tug Fork of the Big Sandy River near Panther. Cline uses his four-wheeler to travel through the mountains from his home on Bull Creek, to his shop near the summit of Greenbrier Mountain and to his mine sites at Panther and Ikes Fork, Wyoming County, West Virginia. Cline's Rock 'N Roll Coal is a model of safety in low-seam underground coal mining.



Advertisers in Action

American Mine Research 109

Analabs, Inc. 82

Blizzard Industrial Supply 101

Bradford Stuart Industries, Inc. 97

Brookville Equipment Corp. 87

Bucyrus... .. 102

Carroll Engineering/Delta Electric... .. 111

Ceramic Technology, Inc. 92

Cincinnati Mine Machinery 24

Cogar Manufacturing, Inc. 40

Damascus Corp. 83

Diann's Advertising... .. 88

Dry Systems Technologies 36

EnerSys. 113

Engart, Inc. 105

Fairchild International... .. 22

Frontier-Kemper Constructors, Inc. 91

GUNDLACH Equipment Corp. 30

Hardsteel 106

Hausner Hard-Chrome, Inc. 99

Heintzmann Corporation. 26

Irwin Car 32

J. H. Fletcher & Company 89

JADCO 100

Jennmar Corp. 107

Jeffrey Radar 34

Kennametal Inc. 90

L-3 Communications. 84

Logan Corp. 108

Marshall Miller & Associates... .. 110

Metalcraft Mining Equipment Rebuilders, Inc. 112

Minova USA... .. 114

Phillips Machine Service 98

RACO International, L.P. 94

Richwood Industries 86

S & S Urethane & Ceramics, Inc. 104

SETCO/RM Wilson Co. 95

Steel Nation... .. 48

Strata Mine Services 85

Taggart Global 52

The Kerry Company, Inc. 96

Wholesale Mine Supply 28

FEATURE

TRACKING THE ASH

When volcanoes erupt, scientists at volcanic ash advisory centers jump into action — tracking ash clouds, issuing alerts and helping airplanes avoid catastrophe. But with many volcanoes under-monitored, researchers are working to improve this system.

Carolyn Gramling



48

FEATURE

REPORT FROM GROUND ZERO

From the wreckage of the World Trade Center buildings to volcanic eruptions, and from wildfires to the aftermath of Hurricanes Katrina and Rita, geoscientists are helping clean up after environmental disasters by analyzing how dusts, ash and muds affect human health.

Geoff Plumlee



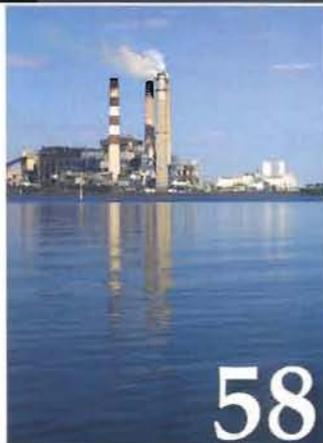
38

FEATURE

WATER IS POWER

Across the United States, cities need more power. Likewise they have a growing appetite for water. Because water and power are inextricably linked, the question is, do we have enough of either?

Erin Wayman



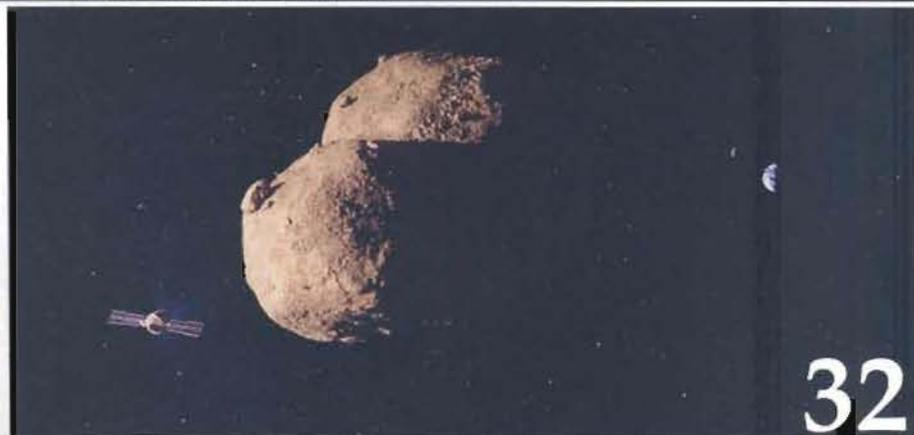
58

TRENDS AND INNOVATIONS

HOW TO DEFLECT AN INCOMING ASTEROID

In a Hollywood movie, if an asteroid were on a collision course with Earth, we would simply send a motley crew to plant a nuclear bomb on the asteroid to blow it to smithereens. But in the real world, scientists have other ideas about how to deflect anything that threatens Earth.

Brian Fisher Johnson



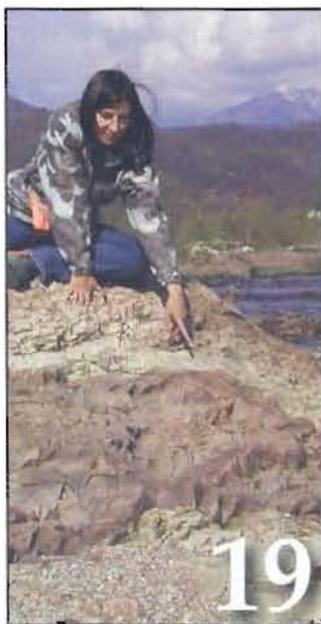
32

NEWS

- 7 NEWS SHORTS
- 8 TREMORS HARBINGERS OF LARGE QUAKES ON SAN ANDREAS?
- 9 NEPTUNE REDISCOVERED
- 10 TRACKING TSUNAMIS VIA SATELLITES COULD SAVE LIVES
- 11 FALSE ALARM MYSTERY AT VOLCANO SOLVED
- 12 SOLAR CYCLE HEATS UP EL NIÑO/LA NIÑA DEBATE
- 13 GEMSTONES: GETTING THE MOST SHINE FOR THE CUT
- 14 CHEMICAL SIGNATURES REVEAL ANCIENT GEOGRAPHY
- 15 BURROWING DINOSAURS
- 16 VENUS' GENTLER, EARTH-LIKE PAST
- 17 POLAR AURORAE NOT MIRRORS OF EACH OTHER
- 17 PIRANHA INTERMEDIATE FOUND
- 18 COLD CASE: SHINING CLOUDS IMPLICATE A COMET IN SIBERIAN IMPACT
- 19 AN UNPRECEDENTED LOOK UP A SUPERVOLCANO'S SKIRT
- 20 DECREASING WINTER CHILL FORETELLS FRUIT PROBLEMS
- 21 TINY NANO-CAGES UNLEASH GEOTHERMAL ENERGY
- 21 DUST: AROUND THE WORLD IN 13 DAYS
- 22 LET IT SNOW — ON MARS
- 23 HEY, LAY OFF MY DUNG!
- 24 TOXIC TRIASSIC TERMINUS
- 25 MINING REFORM ON THE TABLE, AGAIN
- 26 PLANTS AND MOUNTAINS PLAY STARRING ROLE IN CO₂ MANAGEMENT
- 27 MICROBE CITIES BUILT THESE ROCKS
- 27 NANOSCALE CARBON CAPTURE
- 28 LANDSCAPE CHAOS BECOMES ORDER IN EARTH'S VALLEYS
- 29 MINERAL RESOURCE OF THE MONTH: GALLIUM



13



19

RECEIVED

2009 SEP 11 PM 2:10
DENVER, COLORADO

VIEWS

- 95 **A COMMENT**
BUILDING A MORE EARTH SCIENCE-LITERATE PUBLIC
Thanks to an enormous effort, students, textbook publishers, policymakers and the general public now have a go-to document that lists the essential knowledge that everyone should know about earth science.
Michael Wyession
- 96 **GEOLOGIC COLUMN**
A FRESH START
Marie Morisawa got a rare opportunity in science: the chance to roll back time and see a geological process start from the beginning. Such fresh starts are equally rare in politics, so when one happens, we need to seize upon it.
Lisa A. Rossbacher

DEPARTMENTS

- 4 FROM THE EDITOR
- 6 LETTERS: PERSPECTIVES FROM READERS
- 68 **GEOMEDIA**
Web: Computing a Place in the Tree of Life
Web: Twitter: Spreading the Word About Earthquakes
Books:
Buildings' Untold Stories Recorded in "Stories in Stone"



70

Audio: Putting Earth's History to Sound
Books: The Life and Times of "Uranium"

- 74 **CROSS-SECTION: A PUZZLE**
- 75 **WHERE ON EARTH?**
- 76 **BENCHMARKS**
October 9, 1865: First Successful U.S. Oil Pipeline
- 79 **DOWN TO EARTH WITH ...**
PALEOBIOLOGIST, PALEOCLIMATOLOGIST, GEOCHEMIST AND SCIENTIFIC ILLUSTRATOR JESSICA WHITESIDE
- 82 **GEOMARKETPLACE**
- 84 **CLASSIFIEDS: CAREER OPPORTUNITIES**

RECEIVED



COVER STORY

► Peaceful Transition

20 Hydro-Québec's James Bay project is rolling smoothly because the utility is respecting the indigenous people's needs. It's a new experience for both.

SPECIAL REPORT

► Top 225 International Contractors

36 The world's largest contractors are not immune to the global economic turmoil of the past year. However, many believe the industry recession will not severely damage the large, well-run firms

NEWS

► Business & Economics

- 10 **Safety:** Jobsite death and fatality rate decline, but crane-accident fatalities rise
- 12 **Litigation:** Mississippi Supreme Court will rule on coverage of subs under a general contractor's liability insurance
- 13 **Equipment:** Stimulus program "a clunker," manufacturers report

► Buildings

- 12 **Airports:** Wind blows roof off brand-new terminal in Delhi
- 14 **Defects:** Las Vegas high-rise problem leads to six-month ban for California inspector
- 15 **Design Competition:** New York seeks "designer" pedestrian protection

► Transportation

- 16 **Pipelines:** Permit allows work to begin on 992-mile line from Canada
- 17 **Pavements:** Porous concrete replacing traditional drainage systems

18 Construction Economics

71 Pulse

75 Official Proposals (cont. on pp. 76-79)

80 Editorials



DEPARTMENTS

- 4 Online
- 7 Construction Week
- 9 Washington Observer

► For subscriber services call:

(877) 876-8208 or (515) 237-3681

► GO TO MY.ENR.COM FOR PASSWORD-PROTECTED ONLINE ACCESS.

► Not getting ENR Insider and News Alerts? Please call (877) 876-8208

enr.com

ADDITIONAL CONTENT ONLINE

Engineering News-Record

The McGraw-Hill Companies

SERVING THE INDUSTRY SINCE 1874

advertising offices: Two Penn Plaza, New York, N.Y. 10121-2298. Phone (212) 512-2000. Postmaster: Please send address changes to ENR/Engineering News-Record, Attention: Fulfillment Manager, P.O. Box 5730, Harlan, IA 51593. Periodicals postage paid at New York, N.Y., and at additional mailing offices. Canada Post Publication Mail Agreement No. 40012501. Registered for GST as The McGraw-Hill Companies. GST #R123075673. RETURN UNDELIVERABLE CANADIAN ADDRESSES TO: DHR, Global Mail, 355 Admiral Blvd-Unit 4, Mississauga, ON L5T 2N1. Email: enrsubs@worldnet.att.net. Copyright, printing and reprinting: Titles Engineering News-Record (ENR) and CONSTRUCTION WEEK reg. ® in U.S. Patent Office. Copyright © 2009 by The McGraw-Hill Companies. All rights reserved. Officers of The McGraw-Hill Companies, Inc.: Harold W. McGraw III, Chairman, President, and Chief Executive Officer; Robert J. Bahst, Executive Vice President and Chief Financial Officer; Kenneth M. Vittor, Executive Vice President and General Counsel; McGraw-Hill

ENR (Engineering News-Record), (ISSN 0891-9526). Published weekly except for one issue in each month; 40 weeks a year by The McGraw-Hill Companies, 1221 Ave. of the Americas, New York, N.Y. 10020. Founder: James H. McGraw (1860-1948). Executive, editorial, circulation

Construction: Norbert W. Young, Jr., FAIA, President; John Murphy, Director, Finance. Where necessary, permission is granted by copyright owner for those registered with Copyright Clearance Center (CCC), 222 Rosewood Drive, Danvers, Mass. 01923, www.copyright.com, to photocopy any article herein for personal or internal reference use only for the flat fee of \$1.20 per copy for each article. ENR Construction Economics, Top Rankings and Sourcebooks available for a fee in downloadable PDF format at www.ENR.com. Send payment to CCC, ISSN 0891-9526/92. Copying for other than personal or internal reference use without express permission of The McGraw-Hill Companies is prohibited. Write the editor to request such permission. Printed in the USA. Subscription rates for individuals in the field of the publication: U.S. and possessions, \$82 per year (single copies \$9.95 in U.S.); Canada and Mexico, \$89 per year; outside North America, \$195 per year. Please allow four to six weeks for shipment. Subscriber service and single copies: (877) 876-8208 or (515) 237-3681. Send all correspondence, notices and subscription orders to Fulfillment Manager, ENR, P.O. Box 5730, Harlan, IA 51593. If possible, attach address label from a recent issue. Please contact customer service to change your name or address. If the postal authorities alert us that your magazine is undeliverable, we have no further obligation unless we receive a corrected address within two years. Please allow a month for change of address to take effect. Classified advertising: Send ads to ENR, Classified Advertising, Two Penn Plaza, 9th Floor, New York, NY 10121. Phone (212) 904-2815.

"ENR"

September 7, 2009

Contents

Volume 263 • Number 8

RECEIVED

2009 SEP 16 AM 10:14

COVER STORY
DENVER, COLORADO

► **Where Are the Jobs?**

22 Construction employers are boosting payrolls with federal stimulus money to tamp down unemployment. But funding is still slow and may not solve all industry woes.

Photo right courtesy of the U.S. Dept. of Energy/Hanford site



FEATURE

► **Cutting the Clatter**

28 Ford's new 6.7-liter diesel engine was designed in-house and employs innovative ways to save space and weight, increase power and cut noise and emissions.



Diesel debut. Page 28

NEWS

► **Transportation**

10 **Economic Stimulus:** States vying for first ARRA rail grants

14 **Bridges:** Nevada cathedral arch finally shapes into record-breaker

► **Business & Economics**

12 **Lawsuits:** Judge declines to dismiss collapse case against Jacobs

12 **Sustainability:** Sample ordinance called 'biased'

15 **Technology:** Sonar imaging of bridges gains interest from states

16 **Project Management:** Center promotes leadership to make projects manageable

► **Buildings**

13 **Investigation:** Bad design cited in collapse of project with many issues



Garage design faulted. Page 13

► **Environment**

17 **Competitions:** Contest draws eyes and ideas to sustainable coastal cities

18 **Project Delivery:** Design-build saves time for water projects

DEPARTMENTS

- 4** Calendar
- 7** Construction Week
- 9** Washington Observer
- 19** Construction Economics
- 41** Products
- 42** Pulse
- 48** Official Proposals (cont. on pp. 49-50)
- 52** Editorials



► **For subscriber services call:** (877) 876-8208 or (515) 237-3681

► **GO TO MY.ENR.COM FOR PASSWORD-PROTECTED ONLINE ACCESS.**

► **Not getting ENR Insider and News Alerts?** Please call (877) 876-8208

enr.com

ADDITIONAL CONTENT ONLINE

Engineering News-Record

The McGraw-Hill Companies

SERVING THE INDUSTRY SINCE 1874

advertising offices: Two Penn Plaza, New York, N.Y. 10121-2298. Phone (212) 512-2000. Postmaster: Please send address changes to ENR/Engineering News-Record, Attention: Fulfillment Manager, P.O. Box 5730, Harlan, IA 51593. Periodicals postage paid at New York, N.Y., and at additional mailing offices. Canada Post Publication Mail Agreement No. 40012501. Registered for GST as The McGraw-Hill Companies. GST #R123075673. RETURN UNDELIVERABLE CANADIAN ADDRESSES TO: DHL Global Mail, 355 Admiral Blvd-Unit 4, Mississauga, ON L5T 2N1. Email: enr.custserv@cdsfulfillment.com. Copyright, printing and reprinting: Titles Engineering News-Record (ENR) and CONSTRUCTION WEEK reg. ® in U.S. Patent Office. Copyright © 2009 by The McGraw-Hill Companies. All rights reserved. Officers of The McGraw-Hill Companies, Inc.: Harold W. McGraw III, Chairman, President, and Chief Executive Officer; Robert J. Bahash, Executive Vice President and Chief Financial Officer; Kenneth M. Vittor, Executive Vice President and General Counsel. McGraw-Hill

ENR (Engineering News-Record), (ISSN 0891-9526). Published weekly except for one issue in each month; 40 weeks a year by The McGraw-Hill Companies, 1221 Ave. of the Americas, New York, N.Y. 10020. Founder: James H. McGraw (1860-1948). Executive, editorial, circulation,

Construction: Norbert W. Young, Jr., FAIA, President; John Murphy, Director, Finance. Where necessary, permission is granted by copyright owner for those registered with Copyright Clearance Center (CCC), 222 Rosewood Drive, Danvers, Mass. 01923, www.copyright.com, to photocopy any article herein for personal or internal reference use only for the flat fee of \$1.20 per copy for each article. ENR Construction Economics, Top Rankings and Sourcebooks available for a fee in downloadable PDF format at www.ENR.com. Send payment to CCC, ISSN 0891-9526/92. Copying for other than personal or internal reference use without express permission of The McGraw-Hill Companies is prohibited. Write the editor to request such permission. Printed in the USA. Subscription rates for individuals in the field of the publication: U.S. and possessions, \$82 per year (single copies \$9.95 in U.S.); Canada and Mexico, \$89 per year; outside North America, \$195 per year. Please allow four to six weeks for shipment. Subscriber service and single copies: (877) 876-8208 or (515) 237-3681. Send all correspondence, notices and subscription orders to Fulfillment Manager, ENR, P.O. Box 5730, Harlan, IA 51593. If possible, attach address label from a recent issue. Please contact customer service to change your name or address. If the postal authorities alert us that your magazine is undeliverable, we have no further obligation unless we receive a corrected address within two years. Please allow a month for change of address to take effect. Classified advertising: Send ads to ENR, Classified Advertising, Two Penn Plaza, 9th Floor, New York, NY 10121. Phone (212) 904-2815.

ENR

September 14, 2009

Contents

Volume 263 • Number 9

RECEIVED

2009 SEP 29 AM 10:30

COMM-WRC
DENVER, COLORADO

COVER STORY

► Power Broker

8 Traylor Bros.' equipment-rebuilding program takes well-worn machines and transforms them into better-than-new equipment for a variety of tough infrastructure projects.

Cover photo and photo right courtesy of Traylor Bros.



FEATURE

► Top Green Contractors

112 Constructing sustainable buildings no longer is an exercise in idealism, as contractors find owners will embrace green buildings if it means they are more efficient.

SOURCEBOOK

► The Top 400 Contractors

7 Stories and tables are listed on the next page

NEWS

► Buildings

90 Seismic Research: Shake-table tests validate high-performance steel frame

► Business & Economics

93 Labor: Unemployment rate dips, but big job losses continue

97 Planning: Professional society presents disaster assessment manual

► Transportation

94 Bridges: Unexpected Bay bridge crack slightly delays reopening

► Power

98 Energy Efficiency: Conservation could meet 85% of Northwest demand growth



Shake-table test. Page 90.

DEPARTMENTS

- 87** Construction Week
- 89** Washington Observer
- 108** Construction Economics
- 124** Products
- 121** People
- 128** Pulse
- 136** Official Proposals (cont. on pp 137-138)
- 140** Editorials



- For subscriber services call: (877) 876-8208 or (515) 237-3681
- GO TO MY.ENR.COM FOR PASSWORD-PROTECTED ONLINE ACCESS.
- Not getting ENR Insider and News Alerts? Please call (877) 876-8208

enr.com
ADDITIONAL CONTENT ONLINE

Engineering News-Record

The McGraw-Hill Companies

Serving the industry since 1874

advertising offices: Two Penn Plaza, New York, N.Y. 10121-2298. Phone (212) 512-2298. Postmaster: Please send address changes to ENR/Engineering News-Record, Attention: Fulfillment Manager, P.O. Box 5730, Hightstown, NJ 08520. Periodicals postage paid at New York, N.Y., and at additional mailing offices. Canada Post Publication Mail Agreement No. 40012501. Registered for GST as The McGraw-Hill Companies. GST #R123075673. RETURN UNDELIVERABLE CANADIAN ADDRESSES TO: DHL Global Mail, 355 Admiral Blvd-Unit 4, Mississauga, ON L5T 2N1. Email: enrsubs@cdsfulfillment.com. Copyright, printing and reprinting: Titles Engineering News-Record (ENR) and CONSTRUCTION WEEK reg. ® in U.S. Patent Office. Copyright © 2009 by The McGraw-Hill Companies. All rights reserved. Officers of The McGraw-Hill Companies, Inc.: Harold W. McGraw III, Chairman, President, and Chief Executive Officer; Robert J. Bahasi, Executive Vice President and Chief Financial Officer; Kenneth M. Vittor, Executive Vice President and General Counsel. McGraw-Hill

ENR (Engineering News-Record), (ISSN 0891-9526). Published weekly except for one issue in each month; 40 weeks a year by The McGraw-Hill Companies, 1221 Ave of the Americas, New York, N.Y. 10020. Founder: James H. McGraw (1860-1948). Executive, editorial, circulation,

Postmaster: Please send address changes to ENR/Engineering News-Record, Attention: Fulfillment Manager, P.O. Box 5730, Hightstown, NJ 08520. Periodicals postage paid at New York, N.Y., and at additional mailing offices. Canada Post Publication Mail Agreement No. 40012501. Registered for GST as The McGraw-Hill Companies. GST #R123075673. RETURN UNDELIVERABLE CANADIAN ADDRESSES TO: DHL Global Mail, 355 Admiral Blvd-Unit 4, Mississauga, ON L5T 2N1. Email: enrsubs@cdsfulfillment.com. Copyright, printing and reprinting: Titles Engineering News-Record (ENR) and CONSTRUCTION WEEK reg. ® in U.S. Patent Office. Copyright © 2009 by The McGraw-Hill Companies. All rights reserved. Officers of The McGraw-Hill Companies, Inc.: Harold W. McGraw III, Chairman, President, and Chief Executive Officer; Robert J. Bahasi, Executive Vice President and Chief Financial Officer; Kenneth M. Vittor, Executive Vice President and General Counsel. McGraw-Hill

Construction: Norbert W. Young, Jr., FAA, President; John Murphy, Director, Finance. Where necessary, permission is granted by copyright owner for those registered with Copyright Clearance Center (CCC), 222 Rosewood Drive, Danvers, Mass. 01923. www.copyright.com, to photocopy any article herein for personal or internal reference use only for the flat fee of \$1.20 per copy for each article. ENR Construction Economics, Top Rankings and Sourcebooks available for a fee in downloadable PDF format at www.enr.com. Send payment to CCC, ISSN 0891-9526/02. Copying for other than personal or internal reference use without express permission of The McGraw-Hill Companies is prohibited. Write the editor to request such permission. Printed in the USA. Subscription rates for individuals in the field of the publication: U.S. and possessions, \$82 per year (single copies \$9.95 in U.S.); Canada and Mexico, \$89 per year; outside North America, \$195 per year. Please allow four to six weeks for shipment. Subscriber service and single copies: (877) 876-8208 or (515) 237-3681. Send all correspondence, notices and subscription orders to Fulfillment Manager, ENR, P.O. Box 5730, Hightstown, NJ 08520. If possible, attach address label from a recent issue. Please contact customer service to change your name or address. If the postal authorities alert us that your magazine is undeliverable, we have no further obligation unless we receive a corrected address within two years. Please allow a month for change of address to take effect. Classified advertising: Send ads to ENR, Classified Advertising, Two Penn Plaza, 9th Floor, New York, NY 10121. Phone (212) 904-2815.

RECEIVED
"ENR"

September 28, 2009

Contents

Volume 263 • Number 10

2009 OCT -1 AM 10:11

COVER STORY

► Cost Report

53 The drop in materials prices is starting to bottom out, but fierce competition is cutting contractor margins on bid, driving construction costs well below last year's levels.

Cover photo by Istock with digital imaging by ENR, photo right courtesy of Tudor Van Hampton



NEWS

► Business & Economics

8 Companies: Balfour Beatty to buy Parsons Brinckerhoff for \$626 million



Polystyrene building blocks. Page 13

- 9 Tariffs:** Duties hit China pipe imports
- 11 Unions:** Building trades, carpenters rev up organizing rhetoric

► Buildings

10 Codes and Standards: Concrete advocate answers a long line of critics

11 School Construction: House passes bill with \$6.5 billion for K-12, college projects

► Transportation

- 12 Airports:** Silicon Valley's gateway expansion profits from design-build
- 13 Materials:** Geofoam blocks save time on Utah light-rail project



San Jose savings. Page 12

- 49 Construction Economics**
- 68 Products**
- 70 Pulse**
- 72 Official Proposals** (cont. on pp. 73-74)
- 76 Editorials**

DEPARTMENTS

- 4 Update**
- 5 Construction Week**
- 7 Washington Observer**
- 14 Workforce Solutions**



- **For subscriber services call:** (877) 876-8208 or (515) 237-3681
- **GO TO MY.ENR.COM FOR PASSWORD-PROTECTED ONLINE ACCESS.**
- **Not getting ENR Insider and News Alerts? Please call (877) 876-8208**

enr.com
ADDITIONAL CONTENT ONLINE

Engineering News-Record

The McGraw-Hill Companies
Serving the industry since 1874
advertising offices: Two Penn Plaza, New York, N.Y. 10121-2298. Phone (212) 512-2000. Please send address changes to ENR/Engineering News-Record, Attention: Fulfillment Manager, P.O. Box 5730, Harian, IA 51593. Periodicals postage paid at New York, N.Y., and at additional mailing offices. Canada Post Publication Mail Agreement No. 40012501. Registered for GST as The McGraw-Hill Companies. GST #R123075673. RETURN UNDELIVERABLE CANADIAN ADDRESSES TO: DHL Global Mail, 355 Admiral Blvd-Unit 4, Mississauga, ON L5T 2N1. Email: enrsubsterv@cdsfulfillment.com Copyright, printing and reprinting: Titles Engineering News-Record (ENR) and CONSTRUCTION WEEK reg. ® in U.S. Patent Office. Copyright © 2009 by The McGraw-Hill Companies. All rights reserved. Officers of The McGraw-Hill Companies, Inc.: Harold W. McGraw III, Chairman, President, and Chief Executive Officer; Robert J. Bahash, Executive Vice President and Chief Financial Officer; Kenneth M. Vittor, Executive Vice President and General Counsel. McGraw-Hill

ENR (Engineering News-Record), (ISSN 0891-9526). Published weekly except for one issue in each month; 40 weeks a year by The McGraw-Hill Companies, 1221 Ave. of the Americas, New York, N.Y. 10020. Founder: James H. McGraw (1860-1948). Executive, editorial, circulation, Postmaster: Please send address changes to ENR/Engineering News-Record, Attention: Fulfillment Manager, P.O. Box 5730, Harian, IA 51593. Periodicals postage paid at New York, N.Y., and at additional mailing offices. Canada Post Publication Mail Agreement No. 40012501. Registered for GST as The McGraw-Hill Companies. GST #R123075673. RETURN UNDELIVERABLE CANADIAN ADDRESSES TO: DHL Global Mail, 355 Admiral Blvd-Unit 4, Mississauga, ON L5T 2N1. Email: enrsubsterv@cdsfulfillment.com Copyright, printing and reprinting: Titles Engineering News-Record (ENR) and CONSTRUCTION WEEK reg. ® in U.S. Patent Office. Copyright © 2009 by The McGraw-Hill Companies. All rights reserved. Officers of The McGraw-Hill Companies, Inc.: Harold W. McGraw III, Chairman, President, and Chief Executive Officer; Robert J. Bahash, Executive Vice President and Chief Financial Officer; Kenneth M. Vittor, Executive Vice President and General Counsel. McGraw-Hill

Construction: Norbert W. Young, Jr., FRIA, President; John Murphy, Director, Finance. Where necessary, permission is granted by copyright owner for those registered with Copyright Clearance Center (CCC), 222 Rosewood Drive, Danvers, Mass. 01923, www.copyright.com, to photocopy any article herein for personal or internal reference use only for the flat fee of \$1.20 per copy for each article. ENR Construction Economics, Top Rankings and Sourcebooks available for a fee in downloadable PDF format at www.enr.com. Send payment to CCC, ISSN 0891-9526/92. Copying for other than personal or internal reference use without express permission of The McGraw-Hill Companies is prohibited. Write the editor to request such permission. Printed in the USA. Subscription rates for individuals in the field of the publication: U.S. and possessions, \$82 per year (single copies \$9.95 in U.S.); Canada and Mexico, \$89 per year; outside North America, \$195 per year. Please allow four to six weeks for shipment. Subscriber service and single copies: (877) 876-8208 or (515) 237-3681. Send all correspondence, notices and subscription orders to Fulfillment Manager, ENR, P.O. Box 5730, Harian, IA 51593. If possible, attach address label from a recent issue. Please contact customer service to change your name or address. If the postal authorities alert us that your magazine is undeliverable, we have no further obligation unless we receive a corrected address within two years. Please allow a month for change of address to take effect. Classified advertising: Send ads to ENR, Classified Advertising, Two Penn Plaza, 9th Floor, New York, NY 10121. Phone (212) 904-2815.

AIRPORT PHOTO BY JIM PARSONS FOR ENR

Geobiology

Volume 7, Issue 4, September 2009

RECEIVED

2009 SEP -3 AM 10:0

WRC
DENVER, COLORADO

Editorial

- 385 Towards a consistent classification scheme for geochemical environments, or, why we wish the term 'suboxic' would go away
D. E. Canfield and B. Thamdrup

Original Articles

- 393 Garnet-filled trails associated with carbonaceous matter mimicking microbial filaments in Archean basalt
K. Lepot, P. Philippot, K. Benzerara and G.-Y. Wang
- 403 Experimental silicification of the extremophilic Archaea *Pyrococcus abyssi* and *Methanocaldococcus jannaschii*: applications in the search for evidence of life in early Earth and extraterrestrial rocks
F. Orange, F. Westall, J.-R. Disnar, D. Prieur, N. Bienvenu, M. Le Romancer and Ch. Défarge
- 419 Diatom elemental and morphological changes in response to iron limitation: a brief review with potential paleoceanographic applications
A. Marchetti and N. Cassar
- 432 Soft X-ray spectromicroscopy of nickel sorption in a natural river biofilm
A. P. Hitchcock, J. J. Dynes, J. R. Lawrence, M. Obst, G. D. W. Swerhone, D. R. Korber and G. G. Leppard
- 454 Biotic and abiotic controls on iron oxyhydroxide formation in the gill chamber of the hydrothermal vent shrimp *Rimicaris exoculata*
C. Schmidt, L. Corbari, F. Gaill and N. Le Bris
- 465 Temperature dependence of greenhouse gas emissions from three hydromorphic soils at different groundwater levels
S. Vicca, I. A. Janssens, H. Flessa, S. Fiedler and H. F. Jungkunst
- 477 Seaweed attachment to bedrock: biophysical evidence for a new geophycology paradigm
L. Morrison, M. Feely, D. B. Stengel, N. Blamey, P. Dockery, A. Sherlock and É. Timmins

Information on this journal can be accessed at www.geobiol.com
For Earth Sciences News from the Geological World, visit www.earthpages.com

RECEIVED
20 SEP 11 PM 2:51
09.2009

p. 1 of 2

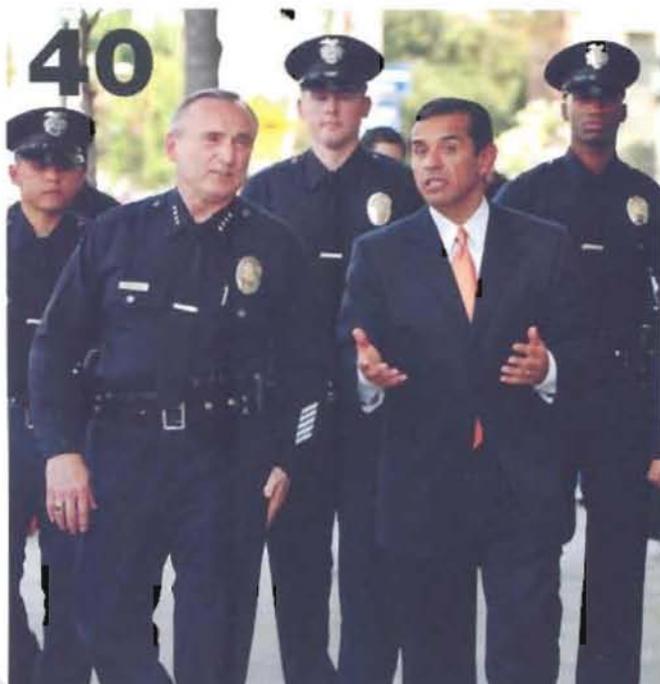
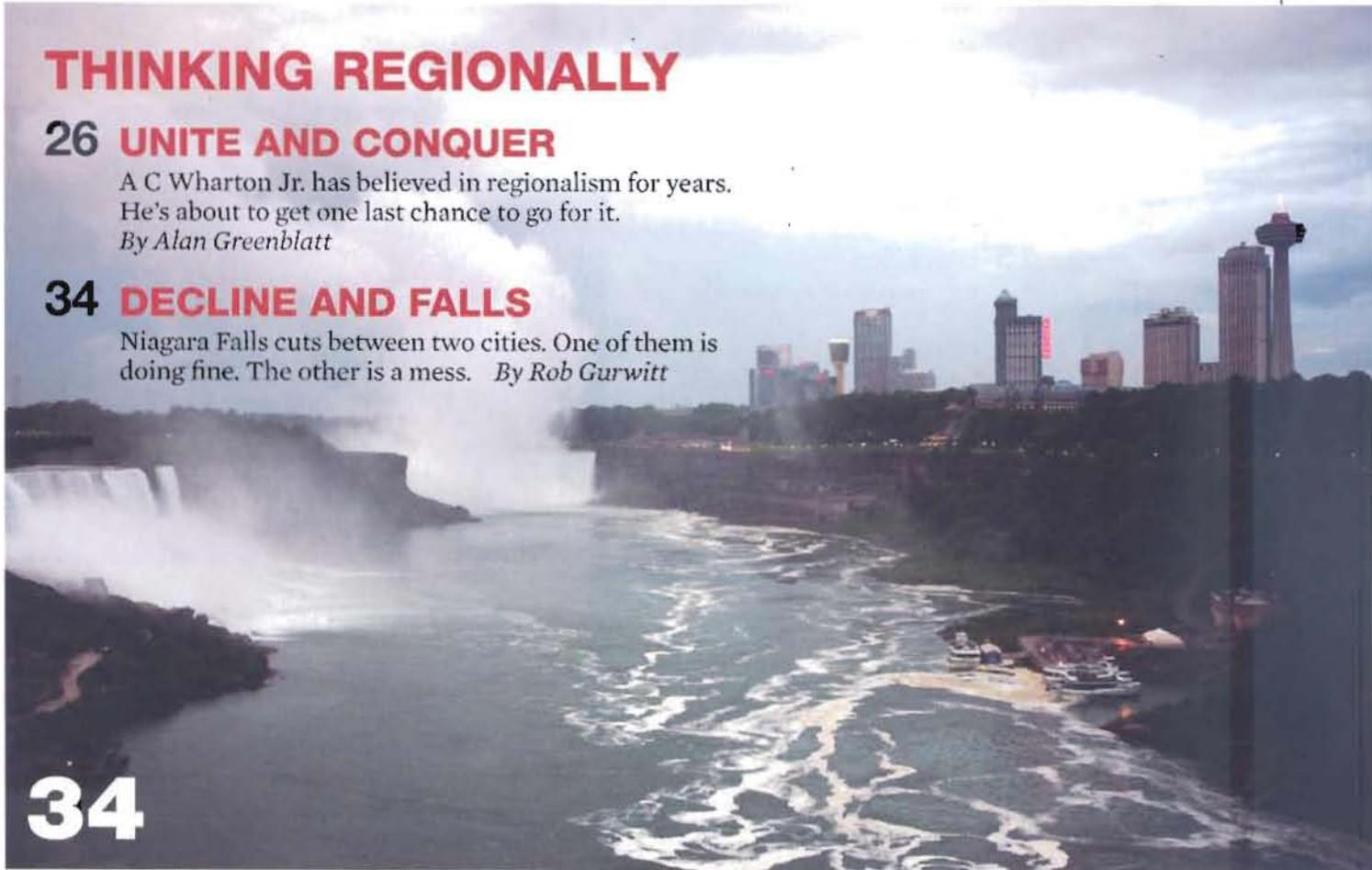
THINKING REGIONALLY

26 UNITE AND CONQUER

A C Wharton Jr. has believed in regionalism for years. He's about to get one last chance to go for it.
By Alan Greenblatt

34 DECLINE AND FALLS

Niagara Falls cuts between two cities. One of them is doing fine. The other is a mess. *By Rob Gurwitt*



40 DRAGNET SLAYER

When Bill Bratton leaves Los Angeles next month, he'll leave behind a lower crime rate. But his real struggle was with the ghosts of the LAPD's past.
By John Buntin

48 WHAT A GAS

Methane from landfills is both a climate-change culprit and a biofuel of the future.
By Brendan Schlauch

52 CHECK-UP CHALLENGE

Primary care is at the heart of national health care reform, but it rests with states to make more of it available—and soon. *By Josh Goodman*

COVER PHOTOGRAPH BY DAVID HADD

(cont.)

6 Letters

8 In This Issue

11 Assessments

Alan Ehrenhalt on conservatives who like mass transit.



14

POLITICS + POLICY

14 Observer

How Bill Richardson got stuck in Santa Fe.

16 Ballot Box

Gay marriage at a crossroads.

17 Health

When death panels were real.

18 Potomac Chronicle

The feds are looking at coordinating policy at a metro level.

19 At Issue

The fight to commercialize highway rest stops.

20 Green Government

Competing for the title of most sustainable office building.

23 Economic Engines

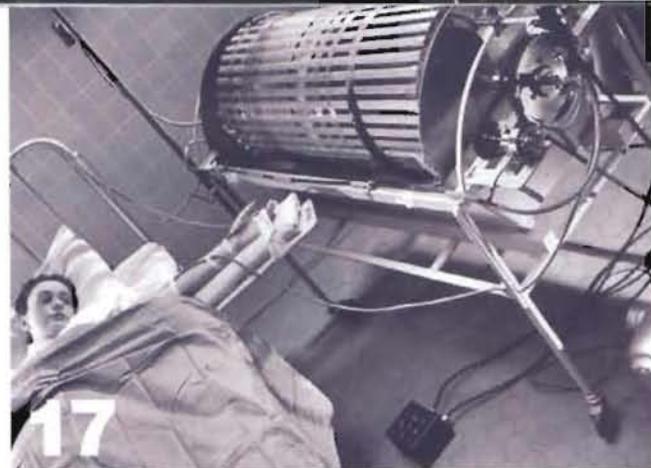
The Empire State Development Corp.: too big to succeed.

24 Urban Notebook

Designers imagine new uses for suburban relics.



23



17



59

PROBLEM SOLVER

55 Who'll Buy My Highway?

The selling of public works to private partners isn't dead. It's just changing. *By Brendan Schlauch*

57 Tech Talk

Using a BlackBerry to catch a bus.

58 Smart Management

How to avoid going overboard with overtime.

59 Idea Center

Running helps the homeless get back on their feet.

62 Public Money

California can blame itself for its fiscal mess.



64 Player

Joe Dear: The new money man at CalPERS.

Contents

SEPTEMBER 2009 VOL. 41 NO. 11

Government Executive

FEATURES

Identity Crisis 20

DHS chief Janet Napolitano treads a fine line between security and privacy in the push to get federal ID programs off the ground. *By Eliza Newlin Carney*

Wanted: More Troops 30

The demand for soldiers in Afghanistan is rising faster than the supply is falling in Iraq. *By Katherine McIntire Peters*

Forecast: Mostly Cloudy 38

Government technologists want to deploy cloud computing, but agencies must learn to let go. *By Carolyn Duffy Marsan*

NEWS+ANALYSIS

Out From Under 13

With a spike in disability benefit claims, SSA is trying to keep its head above water. *By Elizabeth Newell*

Transparently Impossible 15

The alliance between the open government community and the Recovery Board is showing signs of stress. *By Robert Bradsky*

ADVICE+DISSENT

No Looking Back 49

Managing Technology Agencies must upgrade Internet services by 2012. *By Carolyn Duffy Marsan*

Travel Warning 53

Management Matters Managers and employees could end up footing hefty bills for work-related trips. *By Brion Friel*

Paper Chief? 54

Intelligence File DNI Dennis Blair has been challenged by his workforce. *By Shane Harris*

Wargaming Without the War 56

Viewpoint Crisis planners from all walks of leadership have much to learn from the military's ancient art. *By Mark Herman*

Turn Styles 58

Viewpoint Which leadership techniques work and which don't in the quest to change government. *By Dave Mader, Jeff Myers and Steven Kelman*



IN EVERY ISSUE

Editor's Notebook 6

The West and the rise of modern government. *By Tom Shoop*

The Briefing 9

Threat-level makeover, smoking soldiers, stimulus for schools and more.

Perspectives 62

Failures in government can teach us how to succeed. *By Timothy B. Clark*

Cover photograph by Nadav Kander/Contour by Getty Images
Image from the series Obama's People courtesy of The New York Times

CONTENTS

Guest editorial

- Reclamation with trees: the 'dark ages' and the 'Renaissance'
Patrick N. Angel 1
- Dragline dynamic modelling for efficient excavation
Nuray Demirel and Samuel Frimpong 4
- Evaluation of cambial electrical resistance for the appraisal of tree vitality on reclaimed coal lands
Keith Plampling, Martin Haigh, Michael J. Cullis and Rhian E. Jenkins 21
- Study of the settling characteristics of tailings using nuclear magnetic resonance technique
S.C. Motta Cabrera, J. Bryan, B. Komishke and A. Kontzas 33
- A framework for realistic microscopic modelling of surface mining transportation systems
A. Jaoua, D. Riopel and M. Gamache 51

RECEIVED

2009 SEP 25 AM 10:10

INTERNATIONAL JOURNAL OF MINING, RECLAMATION AND ENVIRONMENT

INTERNATIONAL JOURNAL OF MINING, RECLAMATION AND ENVIRONMENT

Volume 23 Number 2 June 2009

CONTENTS

Editorial	77
Book review	78
Role of cut size area on the performance of diamond wire saw machine in quarrying of marble <i>S.C. Jain and S.S. Rathore</i>	79
New 3D engineering curves for predicting stope stability and mining dilution in longitudinal blasthole mining operations <i>S. Yongpaisal, G. Li, R. Pakainis and T. Brady</i>	92
Runoff curve numbers for loose-dumped spoil in the Cumberland Plateau of eastern Kentucky <i>Timothy J. Taylor, Carmen T. Agouridis, Richard C. Warner and Christopher D. Barton</i>	103
Influence of poisonous gases on the bio-oxidation of epalmine gas <i>H.X. Yu, H. Min, Z.M. Lv and J. Liu</i>	121
Geochemistry of waste rock at dumping area <i>Candra Nugraha, Hideki Shimada, Takashi Sasaoka, Masatomo Ichinose, Kikuo Matsui and Imanuel Manege</i>	132
Forecasting aggregates demand: a case study in Attica, Greece <i>Maria Menegaki and Dimitris Kaliampakos</i>	144

RECEIVED

2009 SEP 25 AM 10: 01

LIBRARY
DENVER, COLORADO

RECEIVED

2009 SEP 18 AM 10:18

p. 1 of 2

The following group of papers were presented at the fifth International Phosphorus Workshop held in Esbjerg, Denmark in September 2007. Special thanks are extended to guest editor Brian Kronvang.

- 1924-1929 International Phosphorus Workshop: Diffuse Phosphorus Loss in Surface Water Bodies—Risk Assessment, Mitigation Options, and Ecological Effects in River Basins by Brian Kronvang, Gitte H. Rubak, and Gevwin Heckath
- 1930-1941 Climate Change Effects on Runoff, Catchment Phosphorus Loading and Lake Ecological State, and Potential Adaptations by Erik Jeppesen, Brian Kronvang, Mariana Averhoff, Martin Søndergaard, Kristina M. Hansen, Hans E. Andersen, Torben I. Lauridsen, Lone Liboriussen, Meryem Bekkioğlu, Asda Ozan, and Jørgen E. Olesen
- 1942-1955 Phosphorus Retention in Riparian Buffers: Review of Their Efficiency by Carl Christian Hoffmann, Charlotte Kjaergaard, Juana Uusi-Kamppi, Hans Christian Bruun Hansen, and Brian Kronvang
- 1956-1967 Diffuse Phosphorus Models in the United States and Europe: Their Usages, Scales, and Uncertainties by D.E. Radcliffe, Jim Freer, and Oscar Schotmans
- 1968-1980 Approaches for Quantifying and Managing Diffuse Phosphorus Exports at the Farm/Small Catchment Scale by Richard W. McDowell, David Nash, Anja George, Q.J. Wang, and Rush Dinnien
- 1981-1988 Evaluating the Success of Phosphorus Management from Field to Watershed by Andrew N. Sharpley, Peter J.A. Kleinman, Philip Jordan, Lars Bergström, and Arthur L. Allen
- 1989-1997 Critical Evaluation of the Implementation of Mitigation Options for Phosphorus from Field to Catchment Scales by Rory O. Maguire, Gitte H. Rubak, Brian F. Haggard, and Bob H. Fay
- 1998-2011 Characterization of Phosphorus Sources in Rural Watersheds by P.J.A. Withers, H.P. Jarvie, R.A. Hodgkinson, F.J. Palmer-Felgusé, A. Bates, M. Neal, R. Howells, C.M. Withers, and H.D. Wickham
- 2012-2022 Mitigating Diffuse Phosphorus Transfer from Agriculture According to Cost and Efficiency by P.M. Haygarth, H. ApSimon, M. Besson, D. Harris, R. Hodgkinson, and P.J.A. Withers

Atmospheric Pollutants and Trace Gases

- 1785-1795 Soil Moisture and Mercuric Chloride Volatilization Observations over Three Years by Timothy J. Criss, John H. Brueger, William P. Knies, C.S.T. Daugherty, Lynn G. McKee, Andy Russ, and Jerry I. Hatfield

This issue's cover: Cows grazing a New Zealand dairy farm. See McDowell et al., "Approaches for Quantifying and Managing Diffuse Phosphorus Exports at the Farm/Small Catchment Scale," p. 1968-1980. Image by AgResearch.

- 1796-1802 Performance of a Dispersion Model to Estimate Methane Loss from Cattle in Pens by S.M. McCann, K.A. Beauchemin, T.K. Fleisch, and T. Coates

- 2023-2033 Nitrogen, Tillage, and Crop Rotation Effects on Carbon Dioxide and Methane Fluxes from Irrigated Cropping Systems by Francesco Abbudato, Ardell D. Halverson, and Stephen J. Del Grosso

Bioremediation and Biodegradation

- 1803-1811 Field-Scale Cleanup of Atrazine and Cyanazine Contaminated Soil with a Combined Chemical-Biological Approach by M. Warren, S.D. Comfort, S. Onianwa, T. Sarajananjan, H. Bopandi, C. Harris, D.D. Snow, and D.A. Casada

- 2034-2040 Peroxidase-Mediated Polymerization of 1-Naphthol: Impact of Solution pH and Ionic Strength by Alek Bhandari, Fangfang Xu, David E. Koch, and Robert P. Hunter

- 2041-2049 Evaluation of the Efficiency of a Phytostabilization Process with Biological Indicators of Soil Health by Tur Epelde, José M. Becerra, Iker Mijangos, and Carlos Garbisu

Ecosystem Restoration

- 1812-1820 Estimation of Postfire Nutrient Loss in the Florida Everglades by Y. Qian, S.L. Miao, B. Gu, and Y.C. Li

- 1821-1829 Survival and Growth of Hardwoods in Brown versus Gray Sandstone on a Surface Mine in West Virginia by P. Emerson, J. Skansen, and B. Ziemkiewicz

- 2050-2057 Fresh Water Leaching of Alkaline Bauxite Residue after Sea Water Neutralization by Neal W. Menzies, Ian M. Falcon, Rosemary A. Kopytko, and Peter M. Kopytko

Ground Water Quality

- 1830-1840 Hydrologic and Biogeochemical Controls of River Subsurface Sulfates under Agriculturally Enhanced Ground Water Flow by Richard A. Wildman, Jr., Joseph L. Domagalski, and James G. Hering

Heavy Metals in the Environment

- 2058-2069 Speciation and Mobility of Arsenic in Agricultural Lime by Gerald T. Schmidt, Ka Hei Lui, and Michael Kesten

Landscape and Watershed Processes

- 1841-1847 Nitrogen Mass Balance of a Tile-drained Agricultural Watershed in East-Central Illinois by Lowell E. Gentry, Mark B. David, Frederick E. Belms, Todd V. Royce, and Gregory F. Meisack

- 1848-1860 Nitrate Leaching and Nitrous Oxide Flux in Urban Forests and Grasslands by Peter M. Groffman, Candice O. Williams, Richard V. Pouyat, Lawrence E. Band, and Ian D. Youngs

Continued

2070-2083 Base Flow Nutrient Discharges from Lower Delmarva Peninsula Watersheds of Virginia, USA by Jennifer W. Scanhope, Iris C. Anderson, and William G. Reay

Organic Compounds in the Environment

1861-1869 Behavior of Atrazine in Limited Irrigation Cropping Systems in Colorado: Prior Use Is Important by Dale L. Shaner, Lori Wiles, and Neil Hansen

Plant and Environment Interactions

1870-1877 Soil Nitrate Leaching in Silvopastures Compared with Open Pasture and Pine Plantation by Susan K. Bambo, Jarek Nowak, Ann R. Blum, Alan J. Long, and Anna Osiecka

Surface Water Quality

1878-1886 Gene and Antigen Markers of Shiga-toxin Producing *E. coli* from Michigan and Indiana River Water: Occurrence and Relation to Recreational Water Quality Criteria by Joseph W. Durts, Sheridan K. Hauck, and Lisa R. Fogarty

1887-1891 Natural Ferrihydrite as an Agent for Reducing Turbidity Caused by Suspended Clays by E.E. Rhoton and J.M. Bigham

1892-1900 Identifying Pathways and Processes Affecting Nitrate and Orthophosphate Inputs to Streams in Agricultural Watersheds by Anthony J. Tesaviers, John H. Duff, David M. Wolock, Norman F. Spahr, and James E. Almendinger

1901-1908 Disinfection Byproduct Formation Potentials of Wetlands, Agricultural Drains, and Rivers and the Effect of Biodegradation on Trihalomethane Precursors by Samantha K. Engelage, William T. Stringfellow, and Tracy Letain

2084-2095 Watershed Land Use Controls on Chemical Inputs to Lake Ontario Embayments by Xiaoxia Chen and Charles T. Driscoll

2096-2105 Are Current Phosphorus Risk Indicators Useful to Predict the Quality of Surface Waters in Southern Manitoba, Canada? by Esther Salvano, Don N. Flaten, Alain N. Rousseau, and Renaud Quilbe

2106-2120 Streamside Management Zones Effectiveness for Protecting Water Quality after forestland Application of Biosolids by W.A. Pratt and T.R. Fox

2121-2130 Mitigation Options for Sediment and Phosphorus Loss from Winter-sown Arable Crops by Clare Dray, John N. Quanton, Mairryn Silgram, Alison P. Bailey, Bob Jackson, and Carly J. Stevens

Vadose Zone Processes and Chemical Transport

2131-2137 Mineral-nitrogen Leaching and Ammonia Volatilization from a Rice-Rapeseed System as Affected by 3,4-Dimethylpyrazole Phosphate by Hua Li, Yingen Chen, Xinqiang Liang, Yanfeng Lian, and Wenhong Li

Waste Management

1909-1918 Phosphorus Forms in Conventional and Organic Dairy Manure Identified by Solution and Solid State P-31 NMR Spectroscopy by Zhongqi He, C. Wayne Honeycutt, Timothy S. Griffin, Barbara J. Cade-Menun, Perry J. Pellechia, and Zhengxia Dou

2138-2146 Dietary Protein and Cellulose Effects on Chemical and Microbial Characteristics of Swine Feces and Stored Manure by Cherie J. Ziemer, Brian J. Kern, Steven L. Frabus, Hans Stein, David A. Stahl, and Seana K. Davidson

Wetlands and Aquatic Processes

2147-2158 Phosphorus and Greenhouse Gas Dynamics in a Drained Calcareous Wetland Soil in Minnesota by Erin M. Berryman, Rodney T. Venterea, John M. Baker, Paul R. Bloom, and Brandy Elf

1919-1923 Airborne Endotoxin Concentrations at a Large Open-Lot Dairy in Southern Idaho by Robert S. Dungan and April B. Leyton

2159 Root Feeders: An Ecosystem Perspective reviewed by M.C. Savin

2160 Nanomaterials: Risks and Benefits reviewed by Steven Ripp

iv-v Instructions to Authors

vi-xi This Issue in Journal of Environmental Quality

The Journal of Explosives Engineering
Published by International Society
of Explosives Engineers
30325 Bainbridge Road
Cleveland, Ohio 44139
www.isee.org

Publisher
International Society of Explosives Engineers

Editor
Dede Manross
explo@comcast.net

Contributing Writers
John Brulia
Paul Downing
R.B. Hopler
S. S. "Bud" Jenkins
Bill Reisz

Board of Directors
President
Jerry R. Wallace
Vice President Administration
Ron J. Elliott

Vice President, Technical
John E. Capers

Treasurer
Michael J. Koehler

Secretary
Roger G. Sprague

Past President
Lawrence E. Gilmore

Directors
Nancy Allen
James P. Daley
Dennis A. Efstratiadis
Jack W. Eloranta
Fred Grabner
David Harrison
Phyllis E. Hassler
Richard M. Hosley, Jr.
Thomas S. Jenkins
P. D. (Takis) Katsabanis
Alastair C. Torrance
John E. Wiegand

Executive Director & General Counsel
Jeffrey L. Dean, IOM, CAE

Assistant to the Executive Director
Arlene Chafe

Director of Communication
Dede Manross

Director of Development
Christopher Howell, IOM

Meetings & Conference Manager
Lynn Mangol, CMP

Web Manager
Debbie Kapes

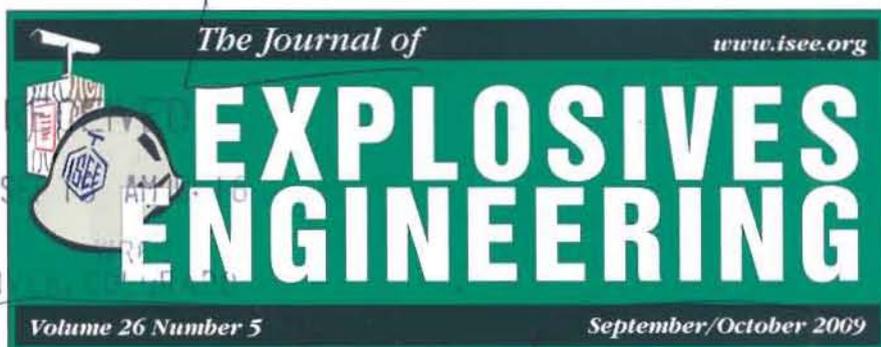
Office Manager
Mary Spena-Bosch

Membership Manager
Yuliya Rodzianko

Membership Assistant
Ruth Schaefer

Meetings Assistant
Lauren Creneti

Assistant Manager Development
Kelli Cox



FEATURES

- 6 History of ISEE**
Learn about ISEE's milestones in this 35th Anniversary Timeline.
- 8 Lake Dorothy Alaska: Underwater Tunnel Piercing the Norwegian Way**
This article describes an Underwater Tunnel Piercing or Lake Tap method used on the Lake Dorothy Hydroelectric Project in Alaska.
- 34 Recent Projects: Dekalb County Georgia**
CBI Teams with Dekalb County Georgia to conduct mock disaster training.
- 36 Missouri Quarry Productivity Improvement - Casework**
This article describes a case study where a quarry's drill and blast practices were evaluated along with loading and crushing equipment with the goal of improving efficiency and lowering the finished product cost.

DEPARTMENTS

- 4 From the Executive Director**
- 22 Member News**
Directory addendum.
- 44 Chapter News**
News from the Tennessee and Eastern PA Chapters of ISEE.
- 23 Industry News**
News about people, companies, events, and new products.
- 24 Calendar of Events**
A list of upcoming events in the explosives industry.
- 28 Explosives, 100 Years Ago, More or Less**
A primer on explosives for coal miners: squibs, fuse and detonators.
- 32 Dynamite Daze**



On the Cover: Summer Internship. ISEE Photo Contest Honorable Mention Winner. This photo was taken in 2008 during a summer internship at Decker Coal Company, a Kiewit mine, near Decker, Montana. Photo by Rebecca Bickal.

Copyright ©2009 Society of Explosives Engineers, Inc., dba International Society of Explosives Engineers

The Journal of Explosives Engineering, published six times per year, is the official publication of the International Society of Explosives Engineers. The Society is not responsible for opinions expressed and statements made by authors in articles or advertisements published in the Journal. ISEE assumes no responsibility for the completeness, accuracy, or conclusions reached in any of the articles or items published in this Journal.

Since the information is unique and because each job site is different, information presented in this Journal may not apply to your specific field situation. Readers are cautioned to carefully consider ideas presented and decide for themselves if the procedures described are safe and appropriate for the intended use. The International Society of Explosives Engineers cannot be responsible for the specific application of the information presented. Also, remember to always consult the manufacturer of the product(s) you are using for recommended practices.

Mention in this publication of a commercial or proprietary product does not constitute an endorsement or recommendation for its use. Registered names, trademarks, logos, artwork, photographs, etc., used in this publication, even without specific indication thereof, are to be considered protected by law.

Yearly subscription rates: \$65 U.S.A., \$80 all others (International Air Mail). All members of the Society receive a complimentary subscription.

All correspondence should be directed to: International Society of Explosives Engineers,
30325 Bainbridge Road, Cleveland, Ohio 44139. Telephone: (440) 349-4400. Fax: (440) 349-5788.
E-mail: isee@isee.org Website: www.isee.org

KENTUCKY JOURNAL OF
EQUINE, AGRICULTURE, AND
NATURAL RESOURCES LAW

University of Kentucky College of Law

Volume 1

2008-2009

Number 1

ARTICLES

*No Contest? An Analysis of the Legality of
Thoroughbred Handicapping Contests under
Conflicting State Law Regimes* 1
Laura A. D'Angelo & Daniel I. Waxman

*State Regulation of Complementary and Alternative
Veterinary Therapies: Defining the Practice of
Veterinary Medicine in the 21st Century* 29
Milton C. Toby

NOTES

*The Pending Farmers' Market Fiasco: Small-Time
Farmers, Part-Time Shoppers, and a Big-Time Problem*..... 49
Brandon Baird

*Reining in the Horse Racing Industry: A Proposal
for Federal Regulation of Steroid Use in Racehorses* 67
Jennifer M. Jabroski

COMMENTS

*Huber Winery v. Wileher: The Commerce Clause,
State Regulations and the Free Trade of Wine*..... 87
William H. Brammell, Jr.

*Topping v. Commissioner: An Example of How an
Equestrian Taxpayer Can Utilize "Single Activity"
to Preclude the IRS "Hobby Loss" Challenge* 97
Anna I. Garcia

*Opening the Door: Recognizing the Many Hats of Jockeys for
Workers' Compensation Coverage*..... 109
Erin N. Malony

*The Role of Administrative Law in Regulating "Mad Cow
Disease" as Explained in Creekstone Farms
Premium Beef, LLC v. Department of Agriculture*..... 123
Courtney E. Ross

*Disappearing Acts: How Parens Patriae Makes Private
Environmental Suits Vanish in the Blink of an Eye* 135
Christopher Way

*Overview of the KJEANRL Paperless
Substantiation Method* 149

RECEIVED
SEP 11 2008
KENTUCKY COLLEGE OF LAW

RECEIVED

2009 SEP 15 AM 10:11

WRC:
DENVER, COLORADO

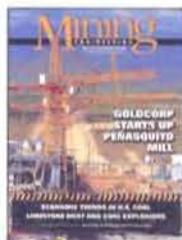
MINING

ENGINEERING

OFFICIAL PUBLICATION OF SME

VOL. 61, NO. 9 SEPTEMBER 2009

COVER STORY



CONTENTS —

Goldcorp's Peñasquito deposit in Mexico is one of the world's largest grassroots precious metals discoveries. The first of two 50-kt/d (55,000-stpd) mill and flotation lines is currently being commissioned, while engineering and construction is under way on the second line. Barry Olson and Steve Dixon describe the project beginning on page 16. Photo courtesy of Goldcorp.

Copyright 2009 by the Society for Mining, Metallurgy and Exploration, Inc. All rights reserved. MINING ENGINEERING (ISSN 0026-5187) is published monthly by the Society for Mining, Metallurgy, and Exploration, Inc., at 8307 Shaffer Parkway, Littleton, CO, 80127-4102. Phone 1-800-763-3132 or 303-973-9550. Fax: 303-973-3845 or e-mail: sme@sme.net.org. Website: www.sme.net.org. Periodicals postage paid at Littleton, CO and additional mailing offices. Canadian post: publications mail agreement number 0689688. **POSTMASTER:** Send changes of address to MINING ENGINEERING, 8307 Shaffer Parkway, Littleton, CO, 80127-4102. Article copies and back issues available on microfilm or microfiche from Linda Hall Library in Kansas City, Mo. Printed by Cummings Printing Co.

FEATURE ARTICLES

16

Goldcorp's new Peñasquito mill
Barry Olson and Steve Dixon

20

Economic trends in the U.S. coal industry
James Kvitkovich

25

Important issues addressed at Longwall USA 2009 show
William Gleason

29

TECHNOLOGY NEWS: Caterpillar moves forward with F series mining trucks

TECHNICAL PAPERS

(peer-reviewed and approved)

64

Sixth spreader upgrader with laser scanner and GPS technology in Hambach surface mine
R.M. Schmitz, R.J. Hempel, N. Bertrams, M. Kaydim, E. Eraydin and U. Kübeler

69

How does limestone rock dust prevent coal dust explosions in coal mines?
C.K. Man and K.A. Teacoach

SPECIAL EDITORIAL SECTION

TUNNELING & UNDERGROUND CONSTRUCTION

19

Port of Miami tunnel tender and design update
Wern-ping (Nick) Chen

27

Onsite assembly and hard rock tunneling at the Jinping-II hydropower station tunnel project
Stephen M. Smading, Joe Roby and Desiree Willis

35

More than 1,300 attend RETC in Las Vegas
Steve Kral

DEPARTMENTS

4

The drift of things

5

President's page

6

Mineral economics and finance

7

Washington survey

8

Industry newswatch

75

SME Foundation

76

Local section news

77

Distinguished members

78

Environmental division news

79

SME division scholarships

83

New members

84

Coming events

86

New products

88

New media

90

Classifieds

91

Professional services

96

Index of advertisers

Reproduction: More than one photocopy of an item from SME may be made for internal use, provided fees are paid directly to the Copyright Clearance Center, 27 Congress St., Salem, MA, 01970, USA. Phone 978-750-8400, fax 978-750-4470. Any other form of reproduction requires special permission from, and may be subject to fees by SME. SME is not responsible for any statements made or opinions expressed in its publications. Member subscription rate included in dues. Nonmember subscription rate, \$245; in Europe, \$275. Single copies \$25. July directory issue, \$150.

NATURAL RESOURCES & ENVIRONMENT

ABA SECTION OF ENVIRONMENT, ENERGY, AND RESOURCES

VOLUME 24, NUMBER 1, SUMMER 2009

FEATURES

- 3 CO₂ Prices and Their Potential Impact on the Western U.S. Power Market
Victor Niemeyer, Lew Rubin, and Kyle Davis
- 6 Settling NRD Claims by Appropriately Valuing Injury and Damages
Suzanne C. Lacampagne and Jeffrey C. Miller
- 9 Protecting the City's Water: Designing a Payment for Ecosystem Services Program
Travis Greenwalt and Deborah McGrath
- 14 Banking on the Environment: Profiting from Investment in REDD
Gia Schneider, William L. Thomas, and Benjamin Vitale
- 18 Green Construction Costs and Benefits: Is National Regulation Warranted?
Leigh Kellett Fletcher
- 25 Federal Government as Angel Investor for Environment & Energy Projects?
Shawna M. Bligh and Chris A. Wendelbo
- 30 Safe Harbor in Financial Storms: Renewable Energy Projects
Arthur J. Harrington
- 33 Anticipating Environmental Issues in an Economic Downturn
David G. Mandelbaum
- 37 Carbon Sequestration: A Liability Pathway to Commercial Viability
David P. Flynn and Susan M. Marriott
- 41 Current Recession to Test Financial Assurance Program
Bruce J. Gruenewald

DEPARTMENTS

VANTAGE POINT Inside Front Cover

INSIGHTS

- To Tax or Not to Tax Carbon—Is That the Question? 44
Roberta Mann
- Oil and Water: Fueling Questions 46
Paula J. Schauerwecker
- President Obama Halts Midnight Regulations 47
Gale Lea Rubrecht
- Reclassifying Pharmaceutical Waste as Universal Waste 49
Sharon R. Siegel
- Precautionary Resource Management and Climate Change 51
Linda R. Larson and Jessica K. Ferrell
- Cap and Trade for Water Conservation 53
Gregory W. Blount
- FERC, Landowners & Natural Gas Infrastructure Projects 55
Delia Patterson

LITERARY RESOURCES 58

THE BACK PAGE 62

Issue Editor:

Hong N. Huynh

Assistant Issue Editors:

Shawna Bligh, Jean Feriancek, Maria Gillen, Larry Mellinger, Mark Ryan

Cover illustration

Punchstock

Department art

Mike Callaway



Printed on recycled paper

The views expressed in *Natural Resources & Environment* are those of the authors and do not necessarily represent the policies of the American Bar Association, the Section of Environment, Energy, and Resources, or the employer of the authors. For more information about NR&E, visit online at www.ababooks.org.

NATURAL RESOURCES & ENVIRONMENT

ABA SECTION OF ENVIRONMENT, ENERGY, AND RESOURCES

VOLUME 24, NUMBER 2, FALL 2009

FEATURES

- 3 **The Evolution and New Directions in Environmental Auditing and Compliance Management**
Ridgway M. Hall, Jr.
- 9 **Green Nanotechnology: Straddling Promise and Uncertainty**
Barbara P. Karn and Lynn L. Bergeson
- 14 **The Clean Water Act on the Cutting Edge: Climate Change and Water-Quality Regulation**
Robin Kundis Craig
- 19 **Better Living through Green Chemistry**
Lee A. DeHihns III, Megan Hey, and C. Max Zygmunt
- 24 **Two Tribes Embrace Green Development Practices for Off-Reservation Projects**
Michelle Diffenderfer and Julia L. Jennison
- 28 **Have "Green" U.S. Automobile Drivers Made an Impact on Greenhouse Gases?**
Jennifer D. Roberts
- 33 **The Past, Present, and Future of Green Building**
Marc Erpenbeck and Colleen Schiman
- 37 **Environmental Due Diligence—Counting Carbon**
Jeff Civins, Mary Mendoza, and Adam Sencenbaugh
- 42 **Financing and Licensing Nuclear Energy Parks**
Patricia L. Campbell and Jim Haried

DEPARTMENTS

- VANTAGE POINT Inside Front Cover
- INSIGHTS
- New Supreme Court Clean Water Decision: Here We Go 48
Mark A. Ryan
- New Marine National Monuments Settle Issues 50
Alison Rieser and Jon M. Van Dyke
- Déjà vu: ESA-Water Clashes in Klamath & Southeast 52
Linus Chen
- Endangered Anurans: Meeting Threats 54
Craig T. Donovan
- Pharmaceuticals in Surface Waters: Use of NEPA 56
Shawna Bligh
- LITERARY RESOURCES 58
- THE BACK PAGE 64

Issue Editor:

Patrick J. Paul

Assistant Issue Editors:

John Barkett, Arnold Lun, Dean Suagee, Andrete Wajite

Cover illustration

Punchstock

Department art

Mike Callaway



Printed on recycled paper

The views expressed in *Natural Resources & Environment* are those of the authors and do not necessarily represent the policies of the American Bar Association; the Section of Environment, Energy, and Resources; or the employer of the authors. For more information about NR&E, visit online at www.ababooks.org.

RECEIVED
SEP 23 PM 1:07
MEMBER COPY

PAY DIRT

MAGAZINE

RECEIVED

2009 SEP -1 PM 12:33

A Voice For Western Mining Since 1938

DENVER, COLORADO

April 2009

Cover Story: Recession will hit exploration budgets hard 3

Mining in the West 6

Worldwide exploration budgets peaked in 2008 • Pebble partners to spend up to \$70 million for permitting • Asarco cutting hours at Amarillo refinery • Mercator ships first moly concentrates from Mineral Park • Judge rules for Asarco on Southern Peru issue • General Moly gets water for Mt. Hope • Bisbee treatment plant is put on furlough • SNS Silver contracts for update on Sunshine • Firstgold ships first gold from Relief Canyon

Energy 11

Rio Tinto selling its Jacobs Ranch coal mine to Arch Coal • New report tracks coal plant construction • Strathmore advances reports at two New Mexico uranium sites • Denison Mines shutting down some operations in the West

Governments and Mining 14

NMA warns of harm from improper cap-and-trade rules • NMA: Delaying permits will cost jobs, energy • DOE starts CO₂ injection into coal seams

Environment 15

NMA's Quinn says need for CCS is urgent • New DOE report views CCS techniques

The Business of Mining 16

Oil sands giants Suncor and Petro-Canada agree to merge • New report tracks global metals exploration budgets • Hunt has 'no regrets' about 1980 silver boom • Some copper producers again taking advantage of hedging • Silver Institute forms nanotechnology group • Revised capital costs for Boleo are down 12%, Baja says • Minefinders' Dolores mine heralds start of positive cash flow

Commentary, 2; Ad Index, 6; Supplying the Mines, 21; Directory, 22; Safety, Health & Labor, 23; Low Grade, 24

On the Cover

This piece of equipment was on an Australian appraisal website, a sign of the times. It's been only a year since a mining company would have to stand in line and pay top dollar to get some exploration drilling done; now, and in the near-term future, it appears, fewer companies are opting for the expense of drilling, choosing instead to conserve cash by doing more in-house work, such as analyzing the cores they already have or by not engaging in exploration work at all. Exploration seems to be one of the first functions to go during downturns in the minerals economy.

PAY DIRT

Magazine

William C. Epler
Publisher and Editor
1968-1995

Frank Barco
Publisher

Gary Dillard
Editor

Dan Eyde • Ted Eyde

George Learning

Clarence Ellis

Chug-A-Lug

Correspondents

Frank Barco
Production Manager

Lupe A. Silva

Production Staff

Caryl L. Larkins
Advertising Sales/Circulation

Mary Farrington

Office Staff

Doug Harris
Maintenance Manager

PAY DIRT (USPS 424-000)
P.O. Drawer 48, Copper Queen Plaza
Bisbee, AZ 85603
(520) 432-2244; FAX (520) 432-2247
E-mail: paydirt@cableone.net

PAY DIRT is published monthly by
Copper Queen Publishing Co. Inc.

Subscription Rates

Single copy	\$ 3.00
One year	\$30.00
Two years	\$55.00
Three years	\$75.00

Canadian subscriptions add \$15.00 per year.
Foreign subscriptions add \$50.00 per year.

Advertising Rates

For information call (520) 432-2244

Periodical postage paid at Bisbee, AZ 85603
Postmaster: Please send Form 3579 to:
PAY DIRT, P.O. Drawer 48, Bisbee, AZ 85603

PAY DIRT RECEIVED

MAGAZINE

2009 SEP 24 PM 1:15

PAY DIRT Magazine

William C. Epler
Publisher and Editor
1968-1995

Frank Barco
Publisher

Gary Dillard
Editor

Dan Eyde • Ted Eyde
George Leaming
Clarence Ellis
Chug-A-Lug
Correspondents

Frank Barco
Production Manager

Lupe A. Silva
Roseana Marinez
Production Staff

Caryl L. Larkins
Advertising Sales/Circulation

Mary Farrington
Office Staff

PAY DIRT (USPS 424-000)
P.O. Drawer 48, Copper Queen Plaza
Bisbee, AZ 85603
(520) 432-2244; FAX (520) 432-2247
E-mail: paydirt@cableone.net

PAY DIRT is published monthly by
Copper Queen Publishing Co. Inc.

Subscription Rates

Single copy	\$ 3.00
One year	\$30.00
Two years	\$55.00
Three years	\$75.00

Canadian subscriptions add \$15.00 per year;
foreign subscriptions add \$30.00 per year

Advertising Rates

For information call (520) 432-2244

Periodical postage paid at Bisbee, AZ 85603
Postmaster: Please send Form 3579 to:
PAY DIRT, P.O. Drawer 48, Bisbee, AZ 85603

A Voice For Western Mining Since 1938 - WRC -
DENVER, COLORADO

May 2009

Cover Story: Coal: contraction now, but future is bright 3

Mining in the West 6

Mineral Park ships first silver to Silver Wheaton • Asarco LLC is awarded \$6 billion from parent Americas Mining Corp. • Study adds 14.7 million ounces of gold at Donlin Creek in Alaska • Quadra's two copper units, Robinson and Carlota, are performing well • Atna, Barrick unit form joint venture at Pinson • Augusta Resource raises \$5 million for working capital • Atna expands Cecil R gold mineralization • Early thaw is managed by crews at Nolan gold mine • Entrée Gold gets good intersects at Lordsburg

Energy 10

EIA says domestic coal production set a record in 2008 • Peabody is founding member of global CCS institute • General Synfuels secures lands to test oil shale technology

Governments and Mining 12

Bingaman introduces his "reform;" has royalty, no patents • Minnesota labor group fighting attack on non-ferrous mines

Environment 13

National Mining Association warns of reach of Clean Water Act proposal • Waxman, Markey have new climate change bill • Group asks Salazar to continue Section 7 rule regarding consultations under ESA • Arch coal mines win Earth Day awards

The Business of Mining 14

Grasberg's gold is major boon to Freeport-McMoRan's net • Southern Copper stays in black; doing better than planned • Peabody maintains good numbers with higher realized prices • Arch Coal beginning to show impact of depressed markets • Barrick reports strong IQ, with earnings, output on track • Falling commodity prices hit Newmont's IQ net • Lower value of by-products hurt Hecla's IQ earnings

Commentary, 2; Ad Index, 6; Directory, 22; Safety, Health & Labor, 23; Low Grade, 24

On the Cover

Major coal producers have cut back on production throughout the West and the world in light of reduced demand for electric power and for metallurgical coal by a depressed steel industry. But the firms have reported somewhat improved prices and they are remaining healthy and ready to boost production once demand improves. (Photo of the coal train is from Peabody Energy's North Antelope Rochelle mine in the Powder River Basin, which loads more than 5,000 trains annually.)

RECEIVED

CONTENTS

2009 SEP 23 PM 1:05

Articles

- 181 **Delaware Country: Landscape, Identity, and Politics in an Oklahoma Indian Tribe**
Brice Obermeyer
- 201 **Pictographs at Hunters Shelter: Possible Extension of the Red Linear Style into the Guadalupe Mountains of Southern New Mexico**
Robert Mark and Evelyn Billo
- 211 **Some Observations on the Smithsonian Institution River Basin Surveys Excavation and Reporting Standards and Conventions**
William B. Butler
- 217 **A Late Prehistoric Bison Processing Camp in the Central Plains: Montana Creek East (14JW46)**
Lauren W. Ritterbush and Brad Logan
- 237 **A Critical Test of the Central Plains Tradition Swidden Model Using Data from the Glenwood Locality**
Daniel Pugh
- 259 **Lithic Technology and Toolstone Variability at Two Gravel Exposures Neighboring the Eastern Llano Estacado**
Paul N. Backhouse, Eileen Johnson, and Doug Cunningham

Book Reviews

- 281 **Simms: Ancient Peoples of the Great Basin & Colorado Plateau.**
Richard K. Talbot
- 282 **Scheiber and Clark: Archaeological Landscapes on the High Plains.**
Mary Lou Larson
- 285 **Meadows: Kiowa Ethnogeography.**
Joaquín Rivaya-Martínez
- 286 **Kavanagh: Comanche Ethnography. Field Notes of E. Adamson Hoebel, Waldo R. Wedel, Gustav G. Carlson, and Robert H. Lowie.**
Benjamin R. Kracht

Announcements

- 200 **2009 Plains Conference**
- 216 **Erratum, Mission Statement**
- 258 **Advertisement**
- 280 **Native American Scholarship Award, Student Paper Competition**

Cover art is from Mark and Billo article, this issue

Rangeland Ecology & Management

A Journal of the Society for Range Management

VOLUME 62

NUMBER 5

SEPTEMBER 2009

Table of Contents

Special Feature: Understanding Diet Selection in Temperate Biodiverse Pasture Systems

Guest Editors—Juan J. Villalba, Kathy J. Soder, and Emilio A. Laca

- 387 Understanding Diet Selection in Temperate Biodiverse Pasture Systems
Juan J. Villalba, Kathy J. Soder, and Emilio A. Laca
- 389 Dietary Selection by Domestic Grazing Ruminants in Temperate Pastures: Current State of Knowledge, Methodologies, and Future Direction
Kathy J. Soder, Pablo Gregorini, Guillermo Scaglia, and Andrew J. Rook
- 399 Learning and Dietary Choice in Herbivores
Juan J. Villalba and Frederick D. Provenza
- 407 New Approaches and Tools for Grazing Management
Emilio A. Laca
- 418 Do Ruminants Alter Their Preference for Pasture Species in Response to the Synchronization of Delivery and Release of Nutrients?
J. Hill, D. F. Chapman, G. P. Cosgrove, and A. J. Parsons
- Forum*
- 428 *Opuntia* Forage Production Systems: Status and Prospects for Rangeland Application
J. C. Guevara, P. Suassuna, and P. Felker
- Research Papers*
- 435 A Case Study Evaluating Economic Implications of Two Grazing Strategies for Cattle Ranches in Northwest Argentina
R. Emiliano Quiroga, Lisandro J. Blanco, and Carlos A. Ferrando
- 445 Remote Sensing of Spatial and Temporal Vegetation Patterns in Two Grazing Systems
Lisandro J. Blanco, Carlos A. Ferrando, and Fernando N. Biurrun
- 452 Modeling Bare Ground With Classification Trees in Northern Spain
Keith T. Weber, Concepción L. Alados, C. Guillermo Bueno, Bhushan Gokhale, Benjamin Komac, and Yolanda Pueyo
- 460 Wild Ungulate Herbivory of Willow on Two National Forest Allotments in Wyoming
Paul J. Meiman, Mark S. Thorne, Quentin D. Skinner, Michael A. Smith, and Jerrold L. Dodd
- 470 Root Responses to Short-Lived Pulses of Soil Nutrients and Shoot Defoliation in Seedlings of Three Rangeland Grasses
José Tulio Arredondo and Douglas A. Johnson
- 480 Influence of Abrams M1A1 Main Battle Tank Disturbance on Tallgrass Prairie Plant Community Structure
Peggy S. Althoff, Mary Beth Kirkham, Timothy C. Todd, Stephen J. Thien, and Philip S. Gipson

Front Cover Photograph: Yearling sheep graze in the annual grasslands of northern California at the Hopland Research and Education Center of the University of California. The research will determine how diet selection, control of medusahead, and ecosystem services vary across different combinations of stocking density and duration. Photo by Emilio A. Laca, 2009.

RECEIVED
SEP 23 PM 1:00
LIBRARY
UNIVERSITY OF CALIFORNIA

RECEIVED

2009 SEP 30 AM 10:11
DENVER, COLORADO

SOIL SCIENCE

An Interdisciplinary Approach to Soils Research

SEPTEMBER 2009

CONTENTS

Vol. 174 No. 9

- FUNDAMENTAL CONSIDERATIONS OF SOIL ORGANIC CARBON DYNAMICS: A NEW THEORETICAL FRAMEWORK 467
Yongsheng Feng
- K-MODEL—A CONTINUOUS MODEL OF SOIL ORGANIC CARBON DYNAMICS: THEORY 482
Yongsheng Feng
- K-MODEL—A CONTINUOUS MODEL OF SOIL ORGANIC CARBON DYNAMICS: MODEL PARAMETERIZATION
AND TESTING 494
Yongsheng Feng
- PREDICTION OF HYDRAULIC CONDUCTIVITY AS RELATED TO PORE SIZE DISTRIBUTION IN
UNSATURATED SOILS 508
Abdel-Monem M. Amer, Sally D. Logsdon, and Dedrick Davis
- POTENTIAL OBSERVATION REDUCTION FOR CHARACTERIZING A SUITE OF SOIL SURFACE PROPERTIES IN
NATIVE PRAIRIES IN THE MIDSOUTHERN UNITED STATES 516
Kristofor R. Brye

Soil Physics

- 1443–1452 **Development of Pedotransfer Functions for Estimation of Soil Hydraulic Parameters using Support Vector Machines**
Nayan K. C. Tiwari, Jitka Šimšáková, and M. G. Schaap
- 1453–1460 **Errors in Water Retention Curves Determined with Pressure Plates**
Marco Bittelli and Markus Flury
- 1461–1468 **Soil Water and Shallow Groundwater Relations in an Agricultural Hillslope**
S. D. Logsdon, C. Hernández-Ramírez, J. L. Hatfield, T. J. Sauer, J. H. Prueger, and K. E. Schilling
- 1604–1613 **Measurement of Transient Soil Water Flux Across a Soil Horizon Interface**
M. E. Dyck and R. C. Kochanowski
- 1614–1625 **Effects of Soil Water Potential and Moisture Content on Sound Speed**
Ziliqun Lu and James M. Sabater
- 1626–1637 **Measurement of the Dielectric Properties of Wyoming Soils Using Electromagnetic Sensors**
T. J. Kelleys, C. B. Papp, and S. T. Gray
- 1638–1645 **Evaluation of the Rawls et al. (1982) Pedotransfer Functions for their Applicability at the U.S. National Scale**
A. Nemes, D. J. Finden, Ya. A. Pachepsky, and W. J. Renals

Soil Physics Note

- 1646–1651 **Water Potentials Produced by Oven-Drying of Soil Samples**
Anthony Dexter and Guy Richard

Soil Chemistry

- 1469–1478 **Soil Metals Analysis Using Laser-Induced Breakdown Spectroscopy (LIBS)**
M. Carl F. Brungren, Galina V. Melnichenko, Melonie A. Stewart, and Robert A. Hull
- 1652–1657 **Organoclay-Based Formulations to Reduce the Environmental Impact of the Herbicide Ofluron in Olive Groves**
C. Fraga, R. Celis, M. C. Hermosín, and J. Cornejo
- 1658–1663 **Determination of Clay Surface Potential: A More Reliable Approach**
Jie Hua, Hang Li, Hualin Zhu, and Liansheng Wu
- 1664–1675 **Impact of Structural Perturbation of Aluminum Hydroxides by Tannate on Arsenate Adsorption**
M. Martin, G. Yu, L. Barbriss, A. Violante, L. M. Kozak, and P. M. Huang

Soil Biology & Biochemistry

- 1479–1487 **Diversity and Dynamics of Methanotrophs within an Experimental Landfill Cover Soil**
Louis B. Jurgita, Samah Att-Bemelmeh, Nathalie Fourn, Alexandre R. Cabral, and Charles W. Crevier

- 1488–1495 **Carbon and Nitrogen Fractions in Dryland Soil Aggregates Affected by Long-term Tillage and Cropping Sequence**
Upendra M. Sainju, Thecan Caesar-Ton Thu, and Jalal D. Jabro

Soil Fertility & Plant Nutrition

- 1496–1503 **Nitrogen Management for Irrigated Potato Production under Conventional and Reduced Tillage**
A. K. Ales, H. P. Collins, and R. A. Boydston
- 1676–1681 **Spatial Estimation of Soil Total Nitrogen Using Cokriging with Predicted Soil Organic Matter Content**
Chunfu Wu, Jiaoping Wu, Yongning Luo, Limin Zhang, and Stephen D. DeGloria

Pedology

- 1504–1509 **Soil Carbon and Nitrogen Accumulation in a Forested Debris Flow Chronosequence, California**
Judith K. Turk and Robert C. Graham
- 1510–1518 **Organic Soils on Basaltic Lava Flows in a Cool, Arid Environment**
Karen L. Vaughan and Paul A. McDaniel
- 1682–1692 **Integrating Different Types of Knowledge for Digital Soil Mapping**
X. Shi, R. Long, R. Decker, and J. Philippe

Soil & Water Management & Conservation

- 1519–1529 **Soil Aggregation and Soil Organic Carbon Stabilization: Effects of Management in Semi-arid Mediterranean Agroecosystems**
J. Álvaro-Fuentes, C. Cantero-Martínez, M. V. López, K. Pastran, R. Dorj, C. E. Stewart, and J. L. Arrié
- 1530–1538 **Soil Physicochemical Properties in a Grassland and Agroecosystem Receiving Varying Organic Inputs**
Sonu Singh, Ravi Mishra, Alka Singh, Nandita Ghoshal, and K. P. Singh
- 1539–1544 **Phosphorus Adsorption and Fractionation in a Two-phase Olive Mill Waste Amended Soil**
A. Lopes-Pereira, D. Cabrerá, D. Peña, A. Albarrián, and J. M. Ruiz Naves
- 1545–1558 **Effect of Soil Spectral Properties on Remote Sensing of Crop Residue Cover**
Guy Seebin, Craig S. T. Daughtry, E. Raymond Hunt, Jr., David J. Brown, and Gregory W. McCarty
- 1559–1565 **Tracing Sediment Movement on a Semiarid Watershed using Rare Earth Elements**
V. O. Polyakov, A. Kimero, M. A. Neaving, and M. H. Nichols
- 1566–1574 **In-Season Optical Sensing Improves Nitrogen-Use Efficiency for Winter Wheat**
F. Li, Y. Miao, F. Zhang, Z. Cai, B. Li, X. Chen, H. Zhang, J. Schroder, W. R. Burn, and J. Jia
- 1693–1698 **Lysimetry versus Neutron Moisture Meter for Evapotranspiration Determination in Four Soils**
Judy A. Falk and Steven R. Fryer

(cont)

1699-1706 **Building Up Organic Matter in a Subtropical Paleodult under Legume Cover-Crop-Based Rotations**
R. C. B. Veern, C. Rayer, J. A. Zamata, J. Mielnicki, and J. Six

Forest, Range & Wildland Soils

1707-1714 **Use of Bayesian Methods to Model Soil Aggregation in Undisturbed Semiarid Grasslands**
Abbey F. Wick, Subhulata V. Uthairathar, and Peter D. Stahl

Nutrient Management & Soil & Plant Analysis

1575-1586 **Assessing Indices for Predicting Potential Nitrogen Mineralization in Soils under Different Management Systems**
Herry H. Schomberg, Silvio Witzthaler, Timothy S. Griffey, D. Wayne Reeves, Miguel I. Cabrera, Dwight S. Fisher, Douku M. Lindale, Jeff M. Nasak, Kay S. Bolhean, Randy L. Raper, Newell R. Karcher, Marni A. Locke, Kenneth D. Porter, Robert C. Schwartz, Clifton C. Truman, and Don D. Tyler

1715-1723 **Sensitivity of Ground-Based Remote Sensing Estimates of Wheat Chlorophyll Content to Variation in Soil Reflectance**
J. U. H. Ead, D. S. Long, P. E. Gessler, L. R. Hunt, Jr., and D. J. Brown

Wetland Soils

1587-1596 **Human-Transported Material Soils of Urbanizing Estuarine Landscapes**
Sean W. Dowd, Mark H. Stolt, Art Gold, and Peter Groffman

1597-1603 **Microbial Indicators of Eutrophication in Everglades Wetlands**
Alan L. Wright, K. Ramesh Reddy, and Susan Newman

1724-1732 **Spatial Variability in Properties Affecting Organic Horizon Carbon Storage in Upland Soils**
M. I. Stoner, D. G. Lumden, M. E. Biliotti, D. Lou, and L. K. Deek

1733-1740 **Spatial Distribution of Carbon in the Subsurface of Riparian Zones**
Gary A. Blazynowski, Mark H. Stolt, Arthur J. Gold, Noel Gutro, and Peter M. Groffman

1741-1753 **Spatial Relationships of Phosphorus Sorption in a Seasonally Saturated Constructed Wetland Soil**
Jonathan J. Maynard, Anthony I. O'Geen, and Randy A. Dahlgren

Other Items

1754-1756 Errata

P. 2 of 2



Membership: A Renewable Resource

Chances are, someone once helped guide your career by suggesting that you join SSSA. Ever since, you've reaped the benefits. Now, you can share the success that membership brings by referring a colleague or student. Through this ongoing renewal, members, our Societies, and our professions become stronger. This strength provides:

- A larger knowledge base,
- More expertise to draw on,
- More qualified pool of candidates for jobs
- Increased visibility and influence on Capitol Hill, and much more.

Help continually renew our membership - visit the SSSA home pages, select Membership, then click "Refer a Colleague."

www.soils.org

We'll send them membership information and an invitation to join. You'll get the thanks.


Membership
A RENEWABLE RESOURCE

CONTENTS

Feature Articles

Seasonal dynamics of small mammals and vegetation in a Gulf cordgrass community. <i>Guy N. Cameron, Jan M. Williams, and Beth L. Krueck</i>	237
Survival and movements of fledgling western bluebirds. <i>Catherine S. Wightman</i>	248
Home ranges of sympatric mule deer and white-tailed deer in Texas. <i>Kristina J. Brunjes, Warren B. Ballard, Mary H. Humphrey, Fieldling Harwell, Nancy E. McIntyre, Paul R. Krausman, and Mark C. Wallace</i>	253
Differences in timing of parturition, birthing sites, and bedding sites of fawns in sympatric populations of deer. <i>David A. Butler, Shawn P. Haskell, Warren B. Ballard, Mark C. Wallace, Carlton M. Britton, and Mary H. Humphrey</i>	261
Effects of disturbance by humans on small mammals in a Chihuahuan Desert ecosystem. <i>Clay A. Stacey and Diana M. Post</i>	272
Speed and accuracy of methods for obtaining measurements of forests. <i>C. Ivan Patterson and Douglas A. James</i>	279
Foraging ecology of peregrine falcons (<i>Falco peregrinus</i>) along the Colorado River, Grand Canyon, Arizona. <i>Lawrence E. Steens, Bryan T. Brozon, and Kirsten Rowell</i>	284
Small mammals and ground-dwelling invertebrates associated with active and controlled colonies of black-tailed prairie dogs (<i>Cynomys ludovicianus</i>). <i>Rachel E. McCaffrey, Mark C. Wallace, and James D. Ray</i>	300
Conserving species in fragmented habitats: population dynamics of the flat-tailed horned lizard, <i>Phrynosoma mcallii</i> . <i>Cameron W. Barrows and Michael F. Allen</i>	307
Species richness, relative abundance, and habitat associations of nocturnal birds along the Rio Grande in southern Texas. <i>Mary Kay Skoruppa, Marc C. Woodin, and Gene Blacklock</i>	317
Long-term occupancy of home ranges and short-term changes in use of habitat by California towhees (<i>Pipilo crissalis</i>). <i>Lauren Benedict</i>	324
Spiders of Ash Meadows National Wildlife Refuge, Nevada. <i>Sarah C. Crenn and Lawrence E. Steens</i>	331

Notes

Agonistic and courtship behaviors in <i>Dianda diaboli</i> , the Devils River minnow. <i>Catherine T. Phillips, James R. Gibson, and Joe N. Fries</i>	341
<i>Rhadinaea myersi</i> (Squamata: Colubridae) in Guerrero and Oaxaca, Mexico. <i>Uri Omar García-Vázquez, Itzel Durán-Fuentes, Adrián Nieto-Montes de Oca, and Hobart M. Smith</i>	345
Abundance and diversity of seeds in digestive tracts of <i>Terrapene carolina</i> and <i>T. ornata</i> in southwestern Missouri. <i>Matt D. Stone and Don Moll</i>	346
<i>Branneria bonoculus</i> (Diplopoda: Chordeumatida: Brannerioidea): new to the millipede fauna of Texas. <i>Chris T. McAllister, William A. Shear, and Rowland M. Shelley</i>	350
Foraging strategy of a California kingsnake in searching for fledglings of the least Bell's vireo. <i>Kevin B. Clark</i>	352
Mount Lyell shrew (<i>Sorex lyelli</i>) in the Sierra Nevada, California, with comments on alpine records of <i>Sorex</i> . <i>Peter N. Epanchin and Andrew Engilis, Jr.</i>	354
New distribution records of an endemic diving beetle, <i>Heterasternus sulphureus</i> (Coleoptera: Dytiscidae: Hydrophilinae), in Arkansas with comments on habitat and conservation. <i>Scott D. Longing and Brian E. Haggard</i>	357
Strong-billed woodcreeper (<i>Xiphocolaptes promeropirhynchus</i>) attempting to capture a mouse. <i>Rebecca G. Peak, Selvin E. Pérez, and Pablo Herrera</i>	362
Husbandry methods for pocket gophers. <i>M. Susan DeVries and Robert S. Sikor</i>	363
Late-summer aggregation of the foothill yellow-legged frog (<i>Rana boylei</i>) in central California. <i>Robert A. Leidy, Earl Gonsolin, and Garrett A. Leidy</i>	367
Announcements	369

Cover: Desert tortoise (*Gopherus agassizii*). Photo by Troy L. Best.

RECEIVED
 2009 SEP 15
 DENVER, CO LIBRARY