

PURCHASE OF SERVICE AGREEMENT

THIS AGREEMENT ("Agreement") is made this 10th day of JUNE 2014, by and between the Adams County Board of County Commissioners, located at 4430 South Adams County Parkway, Brighton, Colorado 80601, hereinafter referred to as the "County," and Leonard Rice Engineers, Inc., located at 1221 Auraria Parkway, Denver, Colorado 80204 hereinafter referred to as the "Contractor." The County and the Contractor may be collectively referred to herein as the "Parties".

The County and the Contractor, for the consideration herein set forth, agree as follows:

1. SERVICES OF THE CONTRACTOR:

- 1.1. All work shall be in accordance with the attached RFP 2014.094 Engineering Consulting Services-Flood Damage to the Mann Lakes Reservoirs and the Contractor's response to the RFP attached hereto as Exhibit A, and incorporated herein by reference. Should there be any discrepancy between Exhibit A and this Agreement the terms and conditions of this Agreement shall prevail.
- 1.2. Emergency Services: In the event the Adams County Board of County Commissioners declares an emergency, the County may request additional services (of the type described in this Agreement or otherwise within the expertise of the Contractor) to be performed by the Contractor. If the County requests such additional services, the Contractor shall provide such services in a timely fashion given the nature of the emergency, pursuant to the terms of this Agreement. Unless otherwise agreed to in writing by the parties, the Contractor shall bill for such services at the rates provided for in this Agreement.

2. RESPONSIBILITIES OF THE COUNTY: The County shall provide information as necessary or requested by the Contractor to enable the Contractor's performance under this Agreement.

3. TERM:

- 3.1. Term of Agreement: The Term of this Agreement shall be completed by February 4, 2014.

4. PAYMENT AND FEE SCHEDULE: The County shall pay the Contractor for services furnished under this Agreement, and the Contractor shall accept as full payment for those services, the sum of forty-six thousand dollars (\$46,000.00).

- 4.1. Payment pursuant to this Agreement, whether in full or in part, is subject to and contingent upon the continuing availability of County funds for the purposes hereof. In the event that funds become unavailable, as determined by the County, the County may immediately terminate this Agreement or amend it accordingly.

5. INDEPENDENT CONTRACTOR: In providing services under this Agreement, the Contractor acts as an independent contractor and not as an employee of the County. The Contractor shall be solely and entirely responsible for his/her acts and the acts of his/her

employees, agents, servants, and subcontractors during the term and performance of this Agreement. No employee, agent, servant, or subcontractor of the Contractor shall be deemed to be an employee, agent, or servant of the County because of the performance of any services or work under this Agreement. The Contractor, at its expense, shall procure and maintain workers' compensation insurance as required by law. Pursuant to the Workers' Compensation Act § 8-40-202(2)(b)(IV), C.R.S., as amended, the Contractor understands that it and its employees and servants are not entitled to workers' compensation benefits from the County. The Contractor further understands that it is solely obligated for the payment of federal and state income tax on any moneys earned pursuant to this Agreement.

6. **NONDISCRIMINATION:**

6.1. **The Contractor shall not discriminate against any employee or qualified applicant for employment because of age, race, color, religion, marital status, disability, sex, or national origin. The Contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices provided by the local public agency setting forth the provisions of this nondiscrimination clause. Adams County is an equal opportunity employer.**

6.1.1. The Contractor will cause the foregoing provisions to be inserted in all subcontracts for any work covered by this Agreement so that such provisions will be binding upon each subcontractor, provided that the foregoing provisions shall not apply to contracts or subcontracts for standard commercial supplies or raw materials.

7. **INDEMNIFICATION:** The Contractor agrees to indemnify and hold harmless the County, its officers, agents, and employees for, from, and against any and all claims, suits, expenses, damages, or other liabilities, including reasonable attorney fees and court costs, arising out of damage or injury to persons, entities, or property, caused or sustained by the negligent acts or omissions in the Contractor's performance of the services pursuant to the terms of this Agreement or as a result of any subcontractors' negligent acts or omissions in the performance of the services pursuant to the terms of this Agreement.

8. **INSURANCE:** The Contractor agrees to maintain insurance of the following types and amounts:

8.1. **Commercial General Liability Insurance:** to include products liability, completed operations, contractual, broad form property damage and personal injury.

8.1.1. Each Occurrence: \$1,000,000

8.1.2. General Aggregate: \$2,000,000

8.2. **Comprehensive Automobile Liability Insurance:** to include all motor vehicles owned, hired, leased, or borrowed.

8.2.1. Bodily Injury/Property Damage: \$1,000,000 (each accident)

8.2.2. Personal Injury Protection: Per Colorado Statutes

8.3. **Workers' Compensation Insurance:** Per Colorado Statutes

8.4. **Professional Liability Insurance:** to include coverage for damages or claims for damages

arising out of the rendering, or failure to render, any professional services, as applicable.

8.4.1. Each Occurrence: \$1,000,000

8.4.2. This insurance requirement applies only to the Contractors who are performing services under this Agreement as professionals licensed under the laws of the State of Colorado, such as physicians, lawyers, engineers, nurses, mental health providers, and any other licensed professionals.

8.5. Adams County as "Additional Insured": The Contractor's commercial general liability, comprehensive automobile liability, and professional liability insurance policies and/or certificates of insurance shall be issued to include Adams County as an "additional insured" and shall include the following provisions:

8.5.1. Underwriters shall have no right of recovery or subrogation against the County, it being the intent of the parties that the insurance policies so affected shall protect both parties and be primary coverage for any and all losses resulting from the actions or negligence of the Contractor.

8.5.2. The insurance companies issuing the policy or policies shall have no recourse against the County for payment of any premiums due or for any assessments under any form of any policy.

8.5.3. Any and all deductibles contained in any insurance policy shall be assumed by and at the sole risk of the Contractor.

8.6. Licensed Insurers: All insurers of the Contractor must be licensed or approved to do business in the State of Colorado. Upon failure of the Contractor to furnish, deliver and/or maintain such insurance as provided herein, this Agreement, at the election of the County, may be immediately declared suspended, discontinued, or terminated. Failure of the Contractor in obtaining and/or maintaining any required insurance shall not relieve the Contractor from any liability under this Agreement, nor shall the insurance requirements be construed to conflict with the obligations of the Contractor concerning indemnification.

8.7. Endorsement: Each insurance policy herein required shall be endorsed to state that coverage shall not be suspended, voided, or canceled without thirty (30) days prior written notice by certified mail, return receipt requested, to the County.

8.8. Proof of Insurance: At any time during the term of this Agreement, the County may require the Contractor to provide proof of the insurance coverage or policies required under this Agreement.

9. TERMINATION:

9.1. For Cause: If, through any cause, the Contractor fails to fulfill its obligations under this Agreement in a timely and proper manner, or if the Contractor violates any of the covenants, conditions, or stipulations of this Agreement, the County shall thereupon have the right to immediately terminate this Agreement, upon giving written notice to the Contractor of such termination and specifying the effective date thereof.

9.2. For Convenience: The County may terminate this Agreement at any time by giving written notice as specified herein to the other party, which notice shall be given at least thirty (30) days prior to the effective date of the termination. If this Agreement is terminated by the County, the Contractor will be paid an amount that bears the same

ratio to the total compensation as the services actually performed bear to the total services the Contractor was to perform under this Agreement, less payments previously made to the Contractor under this Agreement.

10. MUTUAL UNDERSTANDINGS:

- 10.1. Jurisdiction and Venue: The laws of the State of Colorado shall govern as to the interpretation, validity, and effect of this Agreement. The parties agree that jurisdiction and venue for any disputes arising under this Agreement shall be with Adams County, Colorado.
- 10.2. Compliance with Laws: During the performance of this Agreement, the Contractor agrees to strictly adhere to all applicable federal, state, and local laws, rules and regulations, including all licensing and permit requirements. The parties hereto aver that they are familiar with § 18-8-301, et seq., C.R.S. (Bribery and Corrupt Influences), as amended, and § 18-8-401, et seq., C.R.S. (Abuse of Public Office), as amended, and that no violation of such provisions are present. The Contractor warrants that it is in compliance with the residency requirements in §§ 8-17.5-101, et seq., C.R.S. Without limiting the generality of the foregoing, the Contractor expressly agrees to comply with the privacy and security requirements of the Health Insurance Portability and Accountability Act of 1996 (HIPAA).
- 10.3. OSHA: The Contractor shall comply with the requirements of the Occupational Safety and Health Act (OSHA) and shall review and comply with the County's safety regulations while on any County property. Failure to comply with any applicable federal, state or local law, rule, or regulation shall give the County the right to terminate this agreement for cause.
- 10.4. Record Retention: The Contractor shall maintain records and documentation of the services provided under this Agreement, including fiscal records, and shall retain the records for a period of three (3) years from the date this Agreement is terminated. Said records and documents shall be subject at all reasonable times to inspection, review, or audit by authorized Federal, State, or County personnel.
- 10.5. Assign Ability: Neither this Agreement, nor any rights hereunder, in whole or in part, shall be assignable or otherwise transferable by the Contractor without the prior written consent of the County.
- 10.6. Waiver: Waiver of strict performance or the breach of any provision of this Agreement shall not be deemed a waiver, nor shall it prejudice the waiving party's right to require strict performance of the same provision, or any other provision in the future, unless such waiver has rendered future performance commercially impossible.
- 10.7. Force Majeure: Neither party shall be liable for any delay or failure to perform its obligations hereunder to the extent that such delay or failure is caused by a force or event beyond the control of such party including, without limitation, war, embargoes, strikes, governmental restrictions, riots, fires, floods, earthquakes, or other acts of God.
- 10.8. Notice: Any notices given under this Agreement are deemed to have been received and

to be effective: 1) Three (3) days after the same shall have been mailed by certified mail, return receipt requested; 2) Immediately upon hand delivery; or 3) Immediately upon receipt of confirmation that an E-mail was received. For the purposes of this Agreement, any and all notices shall be addressed to the contacts listed below:

Department: Adams County Transportation, Engineering Division
Contact: Eric Weiss
Address: 4430 South Adams County Parkway
City, State, Zip: Brighton, CO 80601
Phone: 720.523.6828
E-mail: cweis@adcogov.org

Department: Adams County Purchasing
Contact: Liz Estrada
Address: 4430 South Adams County Parkway
City, State, Zip: Brighton, Colorado 80601
Phone: 720.523.6052
E-mail: lestrada@adcogov.org

Department: Adams County Attorney's Office
Address: 4430 South Adams County Parkway
City, State, Zip: Brighton, Colorado 80601
Phone: 720.523.6116

Contractor: Leonard Rice Engineers, Inc.
Contact: R. Gregory Roush
Address: 1221 Auraria Parkway
City, State, Zip: Denver, CO 80204
Phone: 303-455-9589
E-mail: Todd.Street@LREWater.com

10.9. Integration of Understanding: This Agreement contains the entire understanding of the parties hereto and neither it, nor the rights and obligations hereunder, may be changed, modified, or waived except by an instrument in writing that is signed by the parties hereto.

10.10. Severability: If any provision of this Agreement is determined to be unenforceable or invalid for any reason, the remainder of this Agreement shall remain in effect, unless otherwise terminated in accordance with the terms contained herein.

10.11. Authorization: Each party represents and warrants that it has the power and ability to enter into this Agreement, to grant the rights granted herein, and to perform the duties and obligations herein described.

11. CHANGE ORDERS OR EXTENSIONS:

11.1. Change Orders: The County may, from time to time, require changes in the scope of the services of the Contractor to be performed herein including, but not limited to,

additional instructions, additional work, and the omission of work previously ordered. The Contractor shall be compensated for all authorized changes in services, pursuant to the applicable provision in the Invitation to Bid, or, if no provision exists, pursuant to the terms of the Change Order.

- 11.2. Extensions: The County may, upon mutual written agreement by the parties, extend the time of completion of services to be performed by the Contractor.

12. COMPLIANCE WITH C.R.S. § 8-17.5-101, ET. SEQ. AS AMENDED 5/13/08: Pursuant to Colorado Revised Statute (C.R.S.), § 8-17.5-101, *et. seq.*, as amended May 13, 2008, the Contractor shall meet the following requirements prior to signing this Agreement (public contract for service) and for the duration thereof:

- 12.1. The Contractor shall certify participation in the E-Verify Program (the electronic employment verification program that is authorized in 8 U.S.C. § 1324a and jointly administered by the United States Department of Homeland Security and the Social Security Administration, or its successor program) or the Department Program (the employment verification program established by the Colorado Department of Labor and Employment pursuant to C.R.S. § 8-17.5-102(5)) on the attached certification.
- 12.2. The Contractor shall not knowingly employ or contract with an illegal alien to perform work under this public contract for services.
- 12.3. The Contractor shall not enter into a contract with a subcontractor that fails to certify to the Contractor that the subcontractor shall not knowingly employ or contract with an illegal alien to perform work under this public contract for services.
- 12.4. At the time of signing this public contract for services, the Contractor has confirmed the employment eligibility of all employees who are newly hired for employment to perform work under this public contract for services through participation in either the E-Verify Program or the Department Program.
- 12.5. The Contractor shall not use either the E-Verify Program or the Department Program procedures to undertake pre-employment screening of job applicants while this public contract for services is being performed.
- 12.6. If the Contractor obtains actual knowledge that a subcontractor performing work under this public contract for services knowingly employs or contracts with an illegal alien, the Contractor shall: notify the subcontractor and the County within three (3) days that the Contractor has actual knowledge that the subcontractor is employing or contracting with an illegal alien; and terminate the subcontract with the subcontractor if within three days of receiving the notice required pursuant to the previous paragraph, the subcontractor does not stop employing or contracting with the illegal alien; except that the Contractor shall not terminate the contract with the subcontractor if during such three (3) days the subcontractor provides information to establish that the subcontractor has not knowingly employed or contracted with an illegal alien.
- 12.7. Contractor shall comply with any reasonable requests by the Department of Labor and Employment (the Department) made in the course of an investigation that the

Department is undertaking pursuant to the authority established in C.R.S. § 8-17.5-102(5).

- 12.8. If Contractor violates this Section, of this Agreement, the County may terminate this Agreement for breach of contract. If the Agreement is so terminated, the Contractor shall be liable for actual and consequential damages to the County.

The remainder of this page is left blank intentionally.

IN WITNESS WHEREOF, the Parties have caused their names to be affixed hereto:

Raymond H. Gonzales

[Signature]
Deputy County Manager

6-10-14
Date

Leonard Rice Engineers, Inc.

[Signature]
Signature

6-10-14
Date

R. Gregory Roush
Printed Name

Chief Operating Officer
Title

Attest:

Karen Long, Clerk and Recorder

Deputy Clerk

Approved as to Form:

[Signature]
Adams County Attorney's Office

NOTARIZATION OF CONTRACTOR'S SIGNATURE:

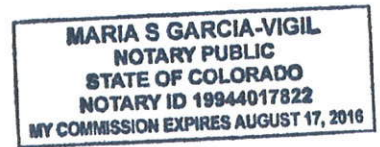
COUNTY OF Denver)

STATE OF Colorado)SS.

Signed and sworn to before me this 10 day of June, 2014,

by R. Gregory Roush,

[Signature]
Notary Public



My commission expires on: 8/17/2016

CONTRACTOR'S CERTIFICATION OF COMPLIANCE

Pursuant to Colorado Revised Statute, § 8-17.5-101, *et seq.*, as amended 5/13/08, as a prerequisite to entering into a contract for services with Adams County, Colorado, the undersigned Contractor hereby certifies that at the time of this certification, Contractor does not knowingly employ or contract with an illegal alien who will perform work under the attached contract for services and that the Contractor will participate in the E-Verify Program or Department program, as those terms are defined in C.R.S. § 8-17.5-101, *et seq.* in order to confirm the employment eligibility of all employees who are newly hired for employment to perform work under the attached contract for services.

CONTRACTOR:

Leonard Rice Engineers, Inc.
Company Name

6-10-14
Date

R. Gregory Roush
Signature

R. Gregory Roush
Name (Print or Type)

Chief Operating Officer
Title

Note: Registration for the E-Verify Program can be completed at: <https://www.vis-dhs.com/employerregistration>. It is recommended that employers review the sample "memorandum of understanding" available at the website prior to registering



**2014.94 Engineering
Consulting Services—
Flood Damage to the
Mann Lakes Reservoirs**

Adams County, Colorado
May 14, 2014

PROPOSAL



May 14, 2014

Adams County Government Center
4430 South Adams County Parkway
Suite C400A
Brighton, Colorado 80601-8212

RE: 2014.94 Engineering Consulting Services – Flood Damage to the Mann Lakes Reservoir Proposal

The impacts of the September 2013 flood were watched in real time all over the country. Though the impact from the aftermath is now out of the news, communities such as Adams County (County) are assessing the damage and determining what it will take to restore infrastructure to pre-flood conditions.

Leonard Rice Engineers, Inc. (LRE), in partnership with Cesare, Inc. (Cesare), has put together a team to investigate, analyze, and repair the damage caused by the flood to the Mann Lakes Reservoir gravel pit liners. Both of our companies have successfully worked for the County currently and in the past. LRE is fortunate to have a previous Cesare engineer on our staff, which helps strengthen the working relationship between our Team and the County.

With Cesare's geotechnical engineering expertise, LRE's project management, design and permitting expertise, and both firms combined expertise in construction related experience we are confident that we will implement this project in a way that restores the Mann Lakes to operational conditions while reducing costs to the County.

Should we be selected for this project, we will propose minor modifications to the indemnity language in the contract.

Thank you for your consideration and please contact me with any additional questions at Todd.Street@LREWater.com or (303) 455.9589.

Sincerely,

LEONARD RICE ENGINEERS, INC.



Dave Colvin, P.G.
Principal / Sr. Project Manager



Todd Street, P.E.
Sr. Project Engineer



**ADAMS COUNTY, COLORADO
PROPOSAL SIGNATURE PAGE
2014.094 Engineering Consulting Services-Flood Damage
To the Mann Lakes Reservoirs.**

VENDOR'S STATEMENT

I have read and fully understand all the special conditions herein set forth in the foregoing paragraphs, and by my signature set forth hereunder, I hereby agree to comply with all said special conditions as stated or implied. In consideration of the above statement, the following proposal is hereby submitted.

WE THE UNDERSIGNED HEREBY ACKNOWLEDGE RECEIPT OF

Addenda # 1 Addenda # _____ Addenda # _____

If None, Please write NONE.
Leonard Rice Engineers, Inc.

May 14, 2014

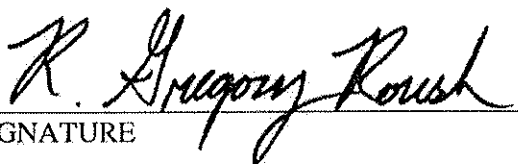
COMPANY NAME

DATE

Corporation
TYPE OF ENTITY (CORPORATION,
GENERAL PARTNERSHIP, ETC.)

84-0618850
TAX IDENTIFICATION NUMBER

Colorado
STATE OF INCORPORATION,
IF APPLICABLE
1221 Auraria Parkway
ADDRESS


SIGNATURE

Denver, Colorado 80204
CITY, STATE, ZIP CODE

R. Gregory Roush
PRINTED SIGNATURE

(303) 455-9589
TELEPHONE NUMBER

(303) 455-0115
FAX NUMBER

Denver
COUNTY

Chief Operating Officer
TITLE (Corporate Officer/Manager/General or
Registered Agent, or General or Managing Partner)

(Seal - If Proposal is by a Corporation)

Statement of Qualifications

Company History and Background

For over 40 years, **Leonard Rice Engineers, Inc. (LRE)** has provided civil and water resources engineering services throughout Colorado. Lee Rice started the company in 1970, and the LRE ownership has evolved from a single owner to an employee owned corporation with eight principal owners.

Currently, LRE employs a staff of over forty, two-thirds of which are registered professional engineers, professional geologists, or professional hydrologists. Our office has recently relocated to 1221 Auraria Parkway, Denver, Colorado, 80204, where all of LRE staff work at and are accessible.

Our firm offers a wide array of engineering consulting and planning services that are needed to meet the physical, environmental planning, permitting, legal, infrastructure design, and data management challenges related to providing water to municipalities, state agencies, and industries. Our structure allows us to offer clients a nimble team of professionals who manage and implement projects from beginning to end. LRE's approach to design is based on our belief that projects are most successful when there is collaboration between the owner and the engineer. We also recognize that successful projects require effective client-consultant communication; therefore, we will assign a single, experienced project manager to be your primary point of contact for every aspect of our partnership.

For this project, we will be partnering with **Cesare, Inc. (Cesare)**, a consulting engineering firm specializing in geotechnical engineering, forensic engineering and failure analysis, engineering geology, QA/QC, construction observation, and construction materials testing. Cesare is a Colorado corporation established in 1987 headquartered in Centennial, Colorado. Their staff includes over 30 dedicated engineers, geologists, and technicians. They operate accredited and validated testing laboratories equipped, staffed and managed to conduct research, design, product development, and testing of soils, asphalt mix, concrete, aggregates, and masonry.

The experience of Cesare's engineering staff ranges from 5 to 37 years with an average of 16 years. Their Centennial staff includes six professional engineers with active registration in nine states. They are considered industry experts in foundation performance, depth of wetting, heave analysis, water resources, pavements, and construction materials. As a leading firm in forensic engineering and failure analysis, they have the unique opportunity to evaluate materials, design standards and construction practices. Their approach and work efforts during design and construction phases are predicated on the knowledge and experience they have gained from their participation in forensic studies.

Leonard Rice Engineers, Inc.
1221 Auraria Parkway
Denver, Colorado 80204

LREWater.com
(303) 455-9589

Todd Street, P.E.
Todd.Street@LREWater.com

Cesare, Inc.
7102 S. Alton Way
Centennial, Colorado 80112

CesareInc.com
(303) 783-9965

Darin R. Duran, P.E.
DDuran@CesareInc.com

Resources and Experience

The highly qualified talents at LRE, in partnership with Cesare for geotechnical engineering, combined with support from Cross Country Survey Consultants (CCS) for surveying, create a winning team to assist Adams County (County) in successfully completing the Mann Lakes Reservoir repairs.

The key experience our team has that is relevant to this project is listed below:

- Coordination with SEO, CDPHE, and other review agencies
- Channel condition surveys
- Soil and foundation studies
- Soil stabilization designs
- Reservoir liner evaluation
- Geologic hazard assessments
- Slurry walls
- Reservoir leak testing
- Slope stabilization
- Infrastructure design and planning
- Opinion of probable cost
- Erosion protection design
- Project specification
- Construction dewatering permitting
- Contract administration
- Construction observation
- Bid assistance
- Advertise, bid and award projects
- Local permits and approvals (e.g. Floodplain permitting, 1041 Permitting)
- Surveying

Project Team

Todd Street, P.E., will be the Project Manager working directly with the County on this project. He will work closely with **Darin Duran, P.E.**, from Cesare, **Chris Muller, P.E.**, and **Dave Colvin, P.E.**, from LRE. In addition, **Jason Murray**, J & T Consulting, will provide senior consultation as needed throughout the project. Mr. Murray's experience will provide a valuable resource as he was involved with the initial Mann Lakes liner design and construction.

Team Qualifications

Todd Street, P.E. – Sr. Project Engineer / Project Manager

Todd has 10 years of experience in hydrology, hydraulics, and geotechnical engineering. His areas of expertise include design of hydraulic structures including diversion structures and spillways; slope stability and seepage modeling; hydraulic and hydrologic modeling (HEC-RAS, HEC-HMS); probabilistic water balance modeling (GoldSim); and foundation soils investigations. Todd has designed and managed construction of numerous surface water diversion structures, spillways and embankment dam repairs in the Front Range, including the United Water and Sanitation Plum Creek Diversion, Barr Lake Spillway and Marshall Lake emergency slope repairs. Prior to joining LRE, Todd worked for Cesare, and his experience as outlined above makes him highly qualified to manage and lend his expertise to the project.

Darin Duran, P.E. – Geotechnical Engineering Manager

Darin has conducted numerous geotechnical studies for residential, commercial, and public facilities. His experience includes soil and foundation studies, pavement and pavement rehabilitation designs, forensic engineering for pavement systems and slope stability, geologic mapping and interpretation, geologic hazards assessments, and value engineering studies; and is the principal review engineer for geotechnical engineering studies. Mr. Duran also has experience with water storage facilities, slurry walls, soil corrosion

potentials, seismic refraction surveys, slope and trench stability analyses, slope stabilization designs, soil stabilization designs, stream channel and bank erosion studies, and gravel resource assessments. In addition, he served on the MGPEC Lime Stabilization Task Force (2001), MGPEC Longitudinal Cracking Task Force (2003), and AEG Governance Committee (2004).

Dave Colvin, P.G. – Sr. Project Manager

Dave is the LRE groundwater group manager and aims to help communities manage groundwater as a consistent, sustainable water supply with added benefits of storage and water quality improvements. He has been a hydrogeologist in water resource and environmental consulting since 1998. Dave is routinely involved with aquifer characterization and testing, and groundwater modeling. Dave's previous work included support for the City of Aurora's Prairie Waters Project North Campus. One of the challenges Dave helped overcome on this project was the design of a leak test for a lined, but unmined reservoir. In addition, he contributed over five years of hydrogeology support during the design, construction, permitting, water rights, optimization and operation of pilot test sites and full scale facilities for both the riverbank filtration (RBF) and Aquifer Recharge and Recovery Systems. Dave also recently managed an RBF feasibility investigation for Tarrant Regional Water District and has focused his work on efficient feasibility project design for subsurface treatment and diversion alternatives.

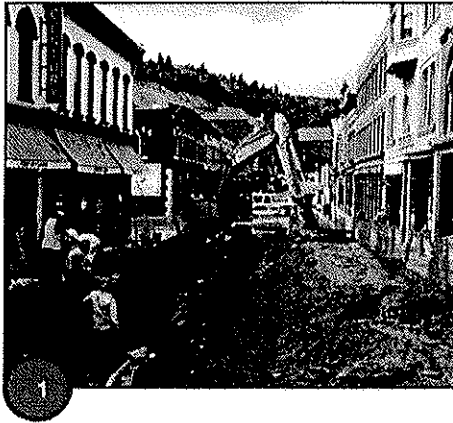
Chris Muller, P.E., Sr. Project Engineer

Chris is a senior project engineer with experience in infrastructure design, hydraulics, and water resources. He specializes in the assessment of existing infrastructure, evaluation and design of infrastructure systems, construction plan review, and construction administration and observation. Chris is LRE's senior project engineer and project manager for ongoing engineering infrastructure services for the Black Hawk/Central City Sanitation District. He also serves as the senior project engineer for ongoing engineering services for Aspen Consolidated Sanitation District.

Additional support to successfully complete the project will be provided by **Jacob Bauer, P.G.**, who will perform the leak test plan and reporting; **JoJo La, E.I.**, who will assist with permitting; and **Jenna Schroeder, E.I.**, who will assist with construction drawings and specifications. Their resumes, along with the key personnel identified above, can be found at the end of our proposal.

Project Descriptions

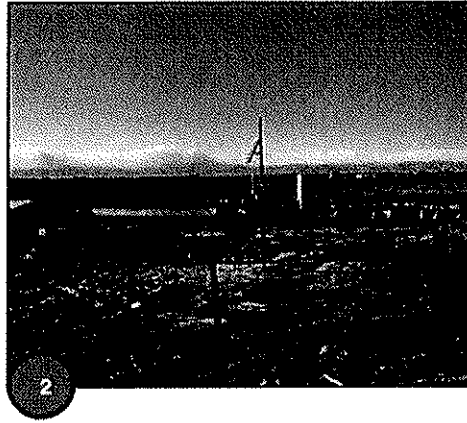
The following projects represent our team's experience relevant to the needs at the Mann Lakes Reservoir.



Ongoing Engineering Services

Client: Black Hawk/Central City Sanitation District (BHCCSD)

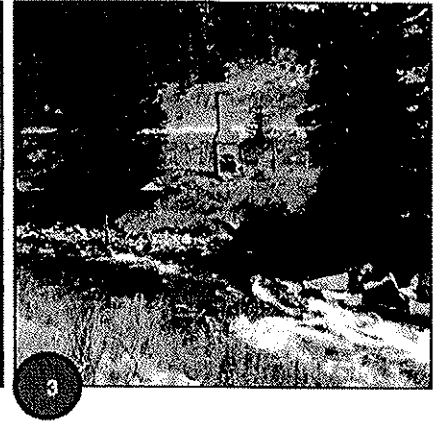
LRE provides Professional Services in connection with infrastructure evaluation, infrastructure design, contract administration, construction observations, and environmental permitting, and compliance. LRE has designed pipeline replacements projects that include project design drawings and project specifications. LRE provides bidding services to the District as well as contract administration services through final acceptance and final payment. LRE provides construction observation service during construction and prepares project punch lists for the contractor upon substantial completion. LRE also provides permitting and permit compliance services to the District.



Recharge Pond Designs

Client: Central Colorado Water Conservancy District (CCWCD)

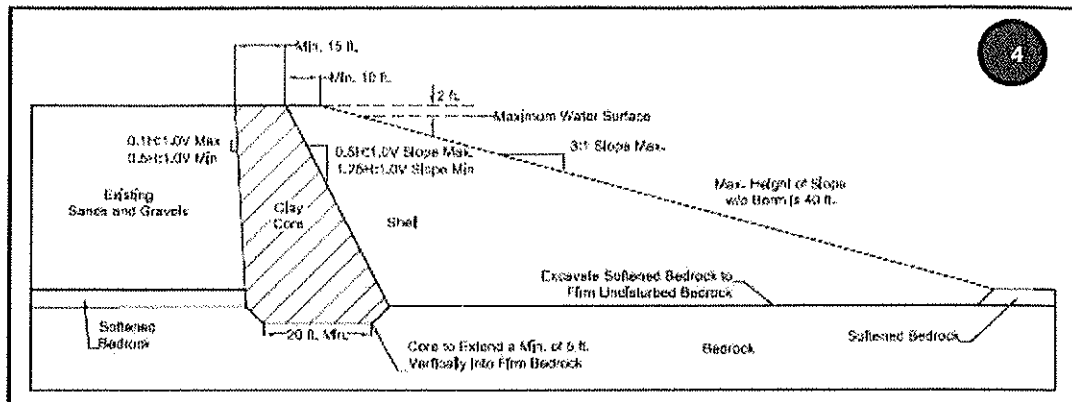
LRE evaluated and designed recharge pond sites for the CCWCD. Design of the recharge ponds included grading, inter connection pipes, inlet structures, and outlet structures. The designs also included erosion protection for areas with a high probability of erosion around inlets, outlets, and transfer pipes.



Snowmaking Intake Structure Replacement

Client: The Vail Corporation (Vail)

LRE provided Professional Services, in connection with environmental permitting, for the reconstruction of a Vail Ski Area snowmaking intake. The replacement of the water supply intake structure required an Army Corps of Engineers 404 permit that authorized the discharge of dredged and fill material (original permit 1995). We applied for a permit modification and were able to successfully modify the existing permit to include the intake structure replacement. In addition, an emergency construction dewatering permit was required for this project that accelerated the approval process from the State. We were able to work with the State to get a dewatering permit for construction in less than two weeks.



4 NCI Pit Reservoir, Weld County, Colorado

Client: J&T Consulting

Cesare conducted an extensive geotechnical study of the site to evaluate the subsurface conditions, with particular emphasis on the bedrock and compacted native soil permeability. Subsurface investigations included auger and core drilling, logging of the borings, and in situ Packer permeability tests of the claystone bedrock. Cesare provided design recommendations for the embankment around the pit.

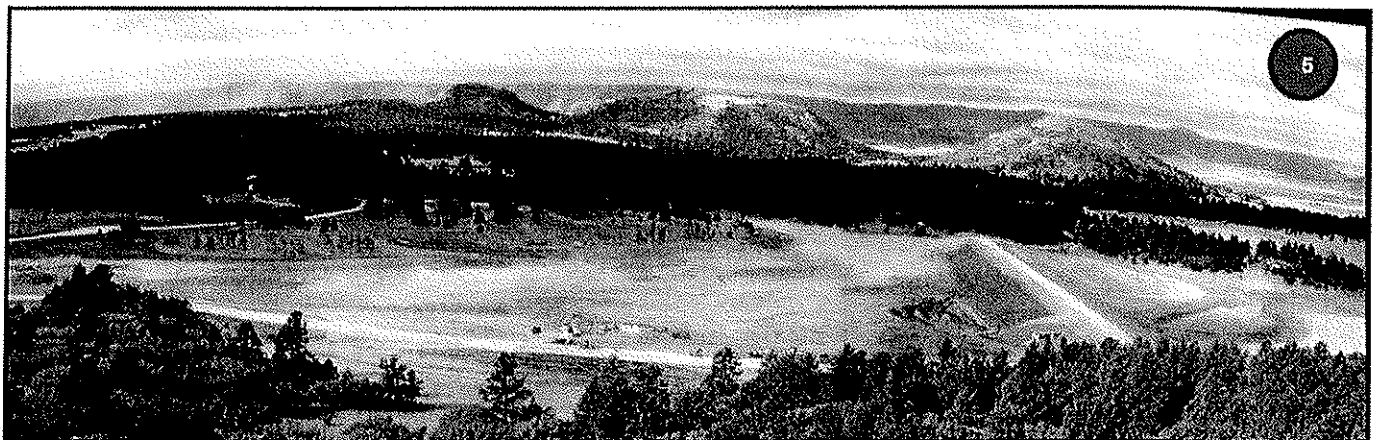
NCCI Pit is an active sand and gravel pit located on the South Platte River that will be converted into a water augmentation reservoir after mining operations. During excavation, the pit uses dewatering wells to lower the water table. The final reservoir will be constructed using a low permeability embankment around its perimeter. During the intermediate construction, a drain will be constructed behind the embankment to lower the water at the embankment/excavation highwall interface.

5 Stillwater Reservoir, Douglas County, Colorado

Client: Howry and Associates

Cesare conducted an extensive geotechnical study and provided a design for remediation of leakage for the Stillwater Reservoir, which is an embankment dam and reservoir that was constructed in the late 1990's at a land development in southern Douglas County. The project was intended to provide a recreation lake for the planned land development, however, the reservoir was found to leak and the lake could not be filled. The design called for lining of the basin and upstream face of the dam with a PVC liner covered with a minimum of one foot of on-site soils. The design was favorably reviewed by the State Engineer's Office, and the project was successfully completed.

Cesare provided engineering consultation and oversight during construction, to make sure the design intent was compliant. Several design modifications or changes were required during construction, in order to address unforeseen conditions. Groundwater was an ongoing issue during construction, and soft ground conditions were encountered at several locations in the basin. Solutions were implemented that were technically sound, constructible, and acceptable to the State Engineer.



References

- 1 Lynn Hillary
Black Hawk Central City Sanitation District
(303) 582-3422
- 2 Randy Ray
Central Colorado Water Conservancy District
(970) 330-4540
- 3 Andrew M. Hnsler
Vail Resorts Management Company
(303) 404-1893
- 4 Mr. Todd Yee
J&T Consulting
(303) 457-0735
- 5 Mr. Robert Howry
Howry and Associates
(303) 688-7951



Project Understanding and Approach

Background

Site Description

The Mann Lakes Reservoir Complex is comprised of three below grade reservoirs located approximately 500 feet west of the South Platte River and bounded by 120th Avenue to the south and 124th Avenue to the north. The three reservoirs are referred to as Lakes #1, #2, and #3 and have a combined storage capacity of approximately 3,080 acre feet. Water is managed between the three reservoirs using a system of interconnects and an operational spillway located in the northeast corner of Lake #1. The three lakes are included in the Adams County Regional Park Master Plan and will eventually be incorporated into the Adams County Regional Park.

Previous Projects and Leak Testing

The Mann Lakes Reservoir Complex was previously operated by Lafarge North America as a series of gravel pits. After the completion of mining, the pits were reclaimed with compacted slope clay liners covered by a gravelly clay protective zone. Between 2006 and 2009 all three lakes passed 90 day leak tests and were certified by the Colorado State Engineer's Office (SEO). In 2011 a series of interconnects was installed that required breaching the liners of all three lakes. Subsequent to the interconnect project, lining of the three lakes was again approved by the SEO based on results of modified 30 day leak testing. In 2012 a breach was discovered in Lake #2. The breach was repaired using a buttress and dewatering drain and a third, 30 day leak test was performed on Lake #2. Results of the 2012 leak test indicated Lake #2 met certification standards. All three lakes are currently certified by the SEO as lined reservoirs in accordance with the August 1999 State Engineer Guidelines for Lining Criteria for Gravel Pits (1999 SEO Guidelines). The three reservoirs have not been operated as water storage facilities.

At the time of the September 2013 Front Range flooding, all three reservoirs were empty. During flooding, water ran down the sides of the reservoirs and damaged the side slopes in six isolated locations. The two most heavily damaged areas are located at the northwest and northeast corners of Lake #1. Less significant erosional damage occurred at the southwest end of Lake #1, in two locations along the northern edge of Lake #2, and along the southwest corner of Lake #3. It is currently unknown if the erosion extended through the protective gravelly clay into the seal zone. During the floods a significant volume of water flowed into Lake #1. Observations from county staff indicate the water surface in Lake #1 has remained relatively unchanged from September 2013 to May 2014. Because net evaporation would be expected, the constant water surface elevation indicates the possibility of a breach in the Lake #1 clay liner. However, ice cover and lower winter evaporation rates may have reduced the anticipated net evaporation in Lake #1.

Funding for the repair work is being provided by the Federal Emergency Management Agency (FEMA). Funding is available to repair the lakes to their pre-flood condition. Costs associated with providing some level of protection against similar damage in the future will be the responsibility of Adams County. Because FEMA funding is limited, a well-planned, cost effective approach to the project is critical to avoid excessive cost and time during the investigation, leak testing, and construction. Our approach employs several cost saving measures such as using existing data to the maximum extent possible, implementing a tiered approach to leak detection, and minimizing leak testing requirements.

Scope

The following sections present the project team and project approach for each task. Based on a site visit and document review, we believe damage at the Mann Lakes Complex is primarily an erosional issue and the clay liner has not been impacted, and our approach addresses the project as such. However, we are fully prepared to identify and design repairs if the liner has been breached. Our approach incorporates a tiered method to determine if and to what degree the liner has been impacted. It will rule out leaks using minimal expense and only escalate the geotechnical investigation as necessary. This is one of several cost saving measures incorporated to reduce engineering fees and allow a larger portion of available funding to be used for repair construction.

Task 1 – Data Review and Site Evaluation

A large amount of project data has been made available by Adams County. This data includes, but is not limited to, plans and technical specifications from previous Mann Lakes construction projects, previous geotechnical evaluations, previous leak test results, and pre-flood topographic mapping. Our approach to the project is to verify and use previously compiled data to the fullest extent possible while supplementing the existing data where required.

As part of the site evaluation we will assess the following:

- Depth and extent of erosion as it compares to original and as built construction plans
- Indicators of a breached liner such as visible seepage or exposed clay
- Sources of flow at each damage location to identify potential mitigation measures that could be easily incorporated into the repair design
- Required topographic survey limits

Task 2 – Survey and Base Map Preparation

Obtaining accurate survey data is a key step in project execution as it will be used at a cursory level to determine the magnitude of impacts to the clay liner in damaged locations. All surveying for the project will be conducted by CCS. The survey will focus primarily on areas impacted by the September 2013 flooding. This will include the depth, location, and extent of both erosion and deposition that resulted from the flooding. The topographic survey will be conducted in NAVD 88 datum using the local West Adams County Densification, Station 165 benchmark, so it can be easily incorporated into existing as-built drawings created by Belt Collins West Ltd., and dated August 21, 2012. In addition to collecting topographic data in the damaged areas, the survey will verify locations of existing utilities and reservoir facilities and obtain additional data where needed. This approach, supplemented with existing data from the county, will result in a complete, accurate topographic base map that depicts existing site conditions and can be created with minimal expense.

Task 3 – Geotechnical Investigation

The determination of whether or not, and to what degree, the clay seal zone was impacted will play a significant role in determining the extent of repairs required, which is the primary goal of our geotechnical investigation. In our opinion, conducting additional extensive subsurface studies of the flood damaged

areas is not necessary as several studies have already been conducted for the previously constructed liners.

This task will include researching and compiling available cross sections, subsurface characterization, and materials data during construction to determine the nature and type of materials that exist. This data may be derived from Adams County or consultants who have worked on previous Mann Lakes projects. The team will observe damaged areas to determine the depth and extent of damage. These observations, in conjunction with construction drawings and survey data, will allow us to determine which layers have been impacted by the floods.

Shallow hand auger holes will be excavated into areas where liner damage cannot be ruled out based on visual observation and survey data. This will provide an opportunity to observe near surface materials beneath erosion features and to collect materials for laboratory testing. We anticipate laboratory testing to consist of grain size distribution and Atterberg limits. We will use the data to determine reasonable engineering properties of the subsurface materials. Laboratory testing is included in our proposed consulting fees.

The team will coordinate with the County to determine areas within the Mann Lakes Reservoir Complex that are suitable for potential borrow areas to be used for repair of the flood damaged liners. Potential borrow areas will be identified using their proximity to the site and available pre-existing subsurface data. Borrow areas will need to be located in areas that can be excavated to provide volume and be within relative proximity of the repair locations to reduce costs associated with hauling. A subsurface study will be conducted by using a back hoe to excavate test pits and verify suitability of the borrow material. Back hoes will mimic actual excavation procedures that will be used to remove borrow material and provide more representative samples than borings. We anticipate the test pits to be between 5 to 15 feet in depth. Test pits will be observed, logged, and sampled. Samples will be returned to the laboratory and appropriate samples tested to determine their applicable engineering properties. We will also evaluate the suitability of eroded material at the toe of the slope as repair fill. At this time we anticipate the testing to consist of grain size distribution, Atterberg limits, moisture/density relationship (Proctor), permeability, and pinhole dispersion.

Task 4 – Analysis

The seepage analysis will be conducted using a combination of visual observation, topographic survey data, test holes, and field seepage measurements. Potential damage to the clay liner and resulting increased seepage will be evaluated using a tiered approach to minimize unnecessary investigations and testing. The first step is a comparison of visual observation, as-built data and survey data to determine if the clay liner has been impacted by erosion. We anticipate damage to the liner can be ruled out at the south end of Lake #1, as well as in Lake #2 and Lake #3 using these methods. Provided the damage is surficial at these locations, we will coordinate a site visit with the SEO to demonstrate the liner has not been impacted.

If damage to the clay liner cannot be ruled out using visual observation and survey data, we will conduct a subsurface investigation using a hand auger to determine the remaining cover depth over the liner. If the subsurface investigation cannot provide a high level of confidence the liner is intact, field measurements of seepage will be conducted using a cutthroat flume. This data will be used to assess the level of damage, if any, the clay liner has incurred. Information from the analysis will determine the severity of damage to the liner and dictate the extent of the repair design. Our Team will consult with the County after each phase of

the seepage analysis to discuss the findings and steps for further investigation.

Using the data, soil engineering properties and cross section developed during Task 3, our team will conduct stability and drawdown analysis of the repair sections. We will utilize the program GEOSTUDIO, which includes Seep/W and Slope/W, to analyze seepage conditions and slope stability under static loading conditions with both full and empty reservoir, full reservoir adjacent to an empty reservoir, and rapid drawdown condition. Results of the geotechnical investigation and the seepage/stability analysis will be presented to the County in a technical memorandum format.

Task 5 – Design Drawings and Technical Specifications

The goal of our repair designs will be to recreate the pre-flood conditions at the reservoir. This will simplify design efforts, avoid duplicating work that has been completed previously, and facilitate interactions with FEMA. In addition to recreating the existing reservoir liner and side slopes, our design will include measures to reduce incurred damage should a similar event occur in the future. These measures will include modifications to the Lake #1 outlet to minimize impacts of backflow events and riprap rundowns to concentrate surface flow and protect against future erosion. If a liner breach is found during analysis and investigation, our design will include a comprehensive breach repair plan that meets SEO gravel pit reservoir performance criteria.

Our team will produce construction documents to include design drawings, technical specifications, a bid schedule, and an opinion of probable cost. We anticipate the drawing set will consist of a cover page, sediment erosion control plan, site plan, and three detail sheets depicting sections and repairs. Design plans will be created using Civil 3D and submitted in electronic and paper format to Adams County for 30 percent and 90 percent reviews. Project specifications will be prepared using 2011 CDOT standard specifications and the latest version of CDOT standard special provisions.

Task 6 – Permitting

A construction dewatering permit will be required to allow the County to dewater the reservoir. Investigation and analysis of the extent of damage to the Mann Lakes Reservoir's liners will require the discharge of groundwater, surface water, and/or stormwater from the Lakes to the South Plate River. It is anticipated that the project will be certified with a General Permit for Construction Dewatering Operations. Our project team will prepare required application materials and information for obtaining a CDPS construction dewatering permit (#COG070000). The permit will be obtained by our team on behalf of Adams County. We have assumed all dewatering operations and monitoring required in association with the dewatering permit will be completed by the County or their selected contractor. Once a contractor has been selected, we recommend transferring the permit into the contractor's name. We anticipate a construction dewatering permit can be obtained within 36 days of the notice to proceed.

In addition to a construction dewatering permit we anticipate an Adams County Grading Permit will also be required. To expedite the construction timeline, our team will also prepare a Grading and Sediment Erosion Control Plan required for the grading permit.

At this time, we believe the construction dewatering and county grading permits will be the only permits required for this project (including other local, federal, or state permits). As more project details and information presents itself, LRE will advise the County.

Task 7 – Bidding Assistance

The project team has extensive experience in providing bid support to a variety of projects. Under Task 7 our team will coordinate and lead a pre bid meeting to include a site visit, provide responses to technical questions for bid addendums, and assist the county in contractor bid evaluations. It will be critical during the bidding process to identify and communicate which bid items are and are not covered by FEMA funding. The bid items included in the bid documents will separate items included and not included in the FEMA funding as separate bid schedules.

Task 8 – Construction Related Services

During construction Cesare personnel will obtain samples of on-site and import soils and conduct laboratory testing as necessary to determine applicable engineering properties. We will observe fill placement and field test materials for moisture and density using test method ASTM D6938 (nuclear gauge method) or ASTM D1556 (sand cone method), as necessary and required per project plans and specifications. Cesare will observe construction procedures to verify that the Contractors procedures meet the intent of design and specifications. At this time, we anticipate items to be tested and observed will consist of material types, proper benching, lift thickness, compaction coverage, moisture content, and density. We anticipate these services will be on a part time basis.

We believe frequent and effective communication between the engineer and contractor is a key component to a successful construction project. In addition to construction observation and testing, our team will perform the following tasks:

- Coordinate a preconstruction meeting with contractor and county
- Review contractor pay applications
- Coordinate a final punch list walk through
- Compile as-built data and provide record drawings
- Provide a construction report including all construction observation reports

Task 9 – Leak Testing

After consultation with the Division of Water Resources Office of the State Engineer (SEO), we are recommending that Mann Lakes Reservoir Complex liner performance data be collected for two months after the reservoir is initially filled. We assume water rights issues will not hinder the schedule of performance testing. If the performance data indicate that the liner meets the design standard referenced in the August 1999 State Engineer Guidelines for Lining Criteria for Gravel Pits (1999 SEO Guidelines), no leak test will be necessary. The design standard requires reservoir groundwater inflows, "*not greater than 0.03 ft³/day/ft² (1 x 10⁻⁵ cm³/cm²/sec) multiplied by the length of the perimeter wall in feet multiplied by the average vertical depth of the perimeter wall as measured from the ground surface to the pit bottom along the toe of the pit side slope, plus 0.0015 ft³/day/ft² (5x 10⁻⁷ cm³/cm²/sec) multiplied by the area of the bottom of the liner system or natural bedrock bounded by the perimeter wall.*" Previous reservoir dimension estimates indicate maximum allowable groundwater inflow of 43, 52, and 50 gpm for Lakes #1, 2, and 3, respectively (Tetra Tech, 2011).

LRE will use publicly available data and on site measuring equipment to track the inflow and outflows of the reservoir. We will monitor pit water volume, dewatering pumping rates, precipitation, and

evaporation. We will use this data to estimate groundwater seepage using a water balance method. LRE will collect the data twice a week and submit the performance data to the SEO in two monthly letter reports.

Schedule & Deliverables

We have prepared a proposed project schedule based on information provided in the Mann Lakes Repairs RFP. Our team will schedule design review meetings with Adams County staff to present the 30 percent and 90 percent design documents. Also, we will maintain communication with the SEO throughout the investigation and design period to ensure they are in agreement with methods and assumptions. Under the proposed schedule we will deliver the Final Design Documents Submittal on or before August 29, 2014. Our proposed project schedule will be heavily dependent on the selected contractor's construction schedule for tasks occurring after submittal of the final design documents. A summary of proposed key submittal dates and a project Gantt chart are presented below and on the following page. Our proposed schedule is based on the following assumptions.

Contract Award on June 2, 2014

A two week review period for the 30 percent and 90 percent document submittals

A two week bidding period

A two month constructing period

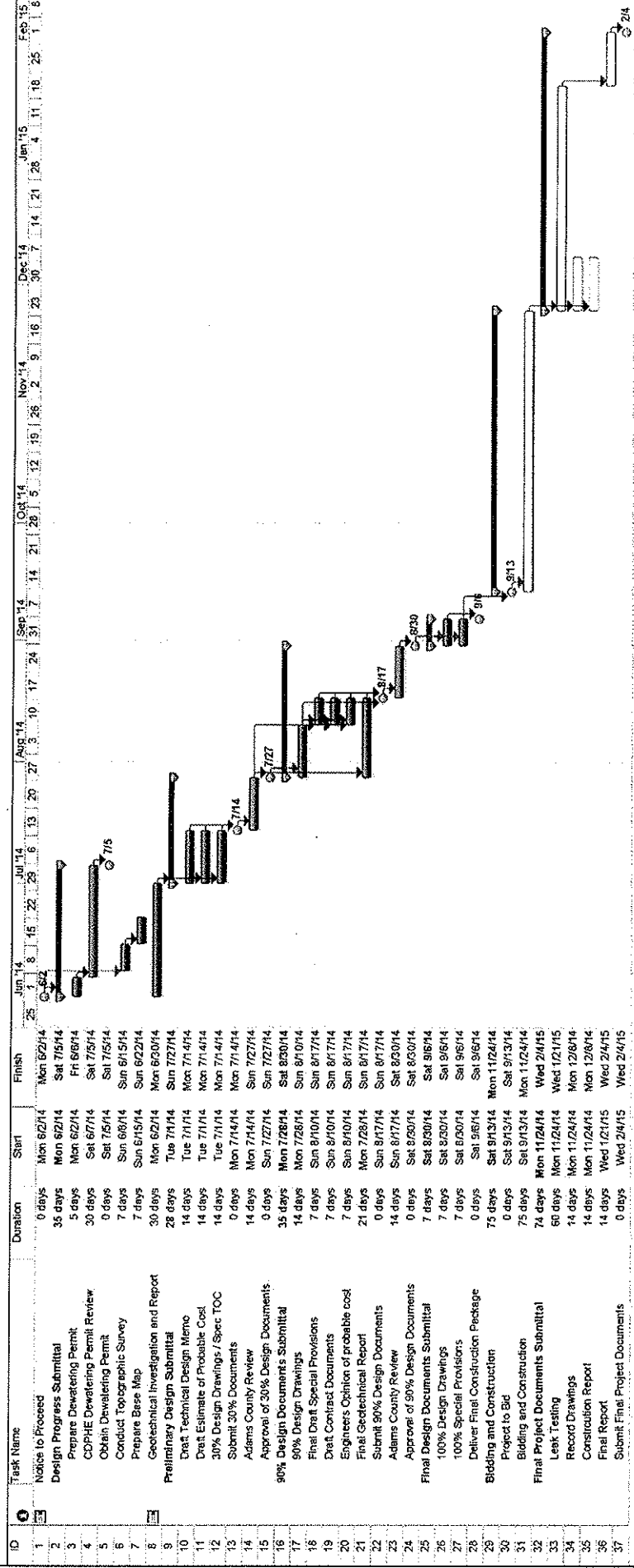
SUMMARY OF KEY DATES	
Estimated Completion Date	Deliverables
June 6, 2014	Dewatering Permit Application
July 7, 2014	Preliminary Design Submittal
August 17, 2014	90 Percent Design Submittal
August 29, 2014	Final Design Document Submittal
February 4, 2014*	Final Project Documents Submittal

**Note: Date contingent upon construction and reservoir filling schedules.*

Project Cost

To successfully complete this project, based on the information at hand, the estimated total project cost is \$46,000. Both LRE and Cesare pride themselves in completing projects on time and within budget. Having past experience working on these types of projects, we are confident that our cost is both competitive and accurate for the needs of the project. A more detailed fee breakdown is available upon request.

**Leonard Rice Engineers, Inc.
Mann Lakes Reservoirs Damage Repairs**



RESUMES

EDUCATION

Colorado School of Mines - December 2003

Bachelor of Science - Civil Engineering

Western Kentucky University - May 2000

Bachelor of Science - Environmental Geology with Chemistry Minor

University of Colorado Denver

Graduate Course - Open Channel Hydraulics

Continuing Education Short Course - Advanced River and Floodplain Modeling using HEC-RAS

PROFESSIONAL REGISTRATION

Colorado Professional Engineer (43370)

New Mexico Professional Engineer (21839)

EXPERIENCE

Mr. Street has nearly ten years of experience in hydrology, hydraulics and geotechnical engineering. His areas of expertise include design of hydraulic structures including channels, spillways, energy dissipation structures, flumes, and diversions; hydraulic and hydrologic modeling (HEC-RAS, HEC-HMS, UDSWM, FlowMaster); slope stability and seepage modeling (slope/W, Seep/W, Slide); and probabilistic water balance modeling for tailings storage facilities, heap leach pads, and reservoirs, (GoldSim).

Leonard Rice Engineers, Inc.

Project Engineer 2013 – Present

Working with our Infrastructure Team, Mr. Street has a wide range of expertise including hydraulic structures, stormwater mitigation, hydraulic modeling, spillway alternatives and design, stream restoration, floodplain management, bank stabilization, and open channel design.

Tierra Group International, Ltd.

Water Resources / Geotechnical Project Engineer 2012 - 2013

Lead design team to produce project documents including design reports, plans, specifications, material quantities and cost estimates. Typical projects include tailings storage facility design, operational analyses and mine closure plans. Assist clients in determining project design criteria and operational decision making. Conduct and manage design of hydraulic structures including canals, spillways, stilling basins and revetments for the purpose of mine site stormwater management. Conduct and manage geotechnical analyses of tailings storage facility (TSF) embankments including slope stability, seepage, pore pressure dissipation, liquefaction, and deformation analyses.

Ecological Resource Consultants, Inc.

Water Resources Project Engineer 2007-2012

Conduct hydrologic and hydraulic analyses using various modeling programs. Responsible for design of hydraulic structures including spillways, diversions, canals, siphons and flow measurement structures. Conduct sediment transport analysis and floodplain evaluations to determine anticipated impacts of channel modifications. Develop Perform runoff calculations and evaluate reservoir inflow design flood routing. Develop scope of work for hydrologic and hydraulic



assessments, conduct alternatives cost analysis and prepare design reports. Coordinate preparation of permitting applications, project plans and specifications. Coordinate between owners, consultants, contractors, regulatory agencies, during planning and construction of water resource development projects.

Joseph A. Cesare and Associates

Geotechnical Staff Engineer 2004-2007

Responsible for report and proposal writing, supervision of large and small scale subsurface investigations and laboratory testing programs, forensic investigation and analysis, and management of construction materials testing projects. Design of foundations, earth retaining structures and pavement systems. Inspection and quality control of earth dam construction, forensic repairs, drilled and helical pier installation, structural fill placement, and concrete drainage structures.

Representative Channel Modification Projects

Barr Lake and Milton Lake Spillway Improvements (Farmers Reservoir and Irrigation Company)

As Project Engineer, designed spillway improvements for both the Barr Lake and Milton Lake spillways. Improvements were required by the State Engineers Office to bring spillway capacity up to 75% of probable maximum precipitation event. Responsibilities included calculation of inflow design flood, reservoir flood routing, alternatives analyses, spillway design, production of construction documents, and coordination with the State Engineers Office. In addition to the spillway improvements, Mr. Street conducted annual dam safety inspections and oversaw dam instrumentation monitoring for both reservoirs.

Marshall Reservoir Emergency Slope Repairs (Farmers Reservoir and Irrigation Company)

As Project Engineer, design emergency slope repairs to mitigate an upstream slope failure at the Marshall Dam in Superior, Colorado. The project provided an opportunity to conduct forensic analysis of failure methods and back calculations of subsurface material properties. Forensic analysis was verified with soil sample laboratory testing. Due to the nature of emergency repairs and the requirement to drain the reservoir, the project required close coordination with State Engineer's Office throughout design and construction.

Plum Creek Diversion (United Water and Sanitation District)

As Project Engineer, conducted an alternatives analysis, designed and managed construction of 40 cfs diversion structure located on Plum Creek in Sedalia, Colorado. Design of the project was complicated by a mobile channel with high sediment loads. The project incorporated an innovative hydroscreen system and properly placed sediment flushing gates to address high sediment loads. The result was a structure capable of diverting the full Plum Creek flow up to a flow rate of 40 cfs with minimal maintenance.

El Bosque and Pozo Azul Tailings Storage Facilities (El Mochito Mine, Honduras)

As Project Engineer, managed closure designs for two large tailings storage facilities at the El Mochito Mine in Las Vegas, Honduras. Design elements included, development of project design criteria, design of closure spillways, management of surface drainage, decant tower decommissioning, cover design and grading, and stability analyses of tailings dams. The design was complicated by a karst environment and history of poorly documented phased dam construction including several upstream dam raises. Deliverables included construction plans and design report.



DARIN R. DURAN, P.E.
Principal, Geotechnical Engineering Manager

EDUCATION

University of Nevada - Reno, Reno, Nevada, M.S. Geological Engineering, 1993
Colorado School of Mines - Golden, Colorado, B.S. Geological Engineering, 1990

PROFESSIONAL HISTORY

Cesare, Inc. - Centennial, Colorado
Principal, Geotechnical Engineering Manager, 1993 to present
Dr. Robert Watters, Consultant - Reno, Nevada
Geological Engineer, 1992-1993

PROFESSIONAL REGISTRATION

Professional Engineer Colorado No. 33919

PROFESSIONAL EXPERIENCE

Mr. Duran has conducted numerous geotechnical studies for residential, commercial and public facilities. His experience includes soil and foundation studies, pavement and pavement rehabilitation designs, forensic engineering for pavement systems and slope stability, geologic mapping and interpretation, geologic hazards assessments, and value engineering studies; and is the principal review engineer for geotechnical engineering studies. Mr. Duran also has experience with water storage facilities, slurry walls, soil corrosion potentials, seismic refraction surveys, slope and trench stability analyses, slope stabilization designs, soil stabilization designs, stream channel and bank erosion studies, and gravel resource assessments. In addition, he served on the MGPEC Lime Stabilization Task Force (2001), MGPEC Longitudinal Cracking Task Force (2003), and AEG Governance Committee (2004).

REPRESENTATIVE PROJECTS

E-470 Segment IV, Adams County, Colorado
Northwest Parkway, Adams, and Boulder Counties, Colorado
Tallyn's Reach Subdivision, Aurora, Colorado
Solterra Subdivision, Lakewood, Colorado
Midtown at Clear Creek, Adams County, Colorado
Vista Peak School Campus, Aurora, Colorado
Lake at Las Vegas Development, Henderson, Nevada
Broomfield Reservoir, Broomfield, Colorado
Penley Reservoir, Douglas County, Colorado
Walker Pit, Douglas County, Colorado
West Farm Reservoir, Lamar, Colorado

AFFILIATIONS/COMMITTEES

Association of Engineering Geologists, 2003-2004 Rocky Mountain Section Chair
Colorado Association of Geotechnical Engineers (CAGE)
Metropolitan Government Pavement Engineers Council (MGPEC)
American Council of Engineering Companies - Colorado
2004, 2010, 2012, 2014 ASCE Geoconference Steering Committee

CONTINUING EDUCATION

Asphalt Technology, 2001 - Auburn University
Pavement Design - LCCA Workshop, 2001 - Colorado Department of Transportation
Pavement Design, 2007 - University of Wisconsin Madison
Perpetual Pavement Workshop, 2008 - Colorado Asphalt Pavement Association (CAPA)
Underpinning and Strengthening of Foundations, 2008, ASCE
Maintaining Asphalt Pavements, 2009 - University of Wisconsin Madison
Geotechnical Modeling Workshop, 2009 - GeoStudio
Analysis of Soil-Structure Interaction Problems Using LPile Plus, 2009, CAGE
Practical Implementation of LRFD for Geotechnical Engineers (Earth Retaining Structures; Shallow Foundations for Soil and Rock), 2010 - ASCE
Asphalt Mixture Design Seminar, 2011 - CAPA
Design of Foundations for Dynamic Loads, 2011- ASCE

PRESENTATIONS/TECHNICAL PAPERS

"More Than Just Lines on a Map", Geotechnical Engineering in Transportation, ASCE Conference, 2002.
"Soil Mechanics for Earthwork Contractors", Instructor, 1998 and 2002.
"Asphalt Technology Short Course", Instructor, Steamboat Springs, 2002.
"Groundwater and Environmental Contamination", Instructor, Teachers Workshop, AEG National Convention, 2003.
"Heave Potential Associated with Ettringite Formation in Lime Treated Materials for an Aurora, Colorado Roadway," GeoTrends, ASCE Conference, 2010.
"Solving the Frost Heave Problems with Foamed FlashFill," CAGE, 2010; MGPEC Annual Meeting; 2011; World of Coal Ash, 2011.
"An Introduction to Soils Reports", presentation given to Aurora Public Schools, Brannan Companies, 2012.
"Overlot Grading to Fine Grading," Colorado Defense Lawyers Association, May 2013
"Soil Mechanics, Bearing Capacity and Slope Stabilization," HalfMoon Education, Inc, presenter, November 14, 2013.

EDUCATION

M.S., Environmental Science and Engineering, Colorado School of Mines, Golden, 2002
B.S., Geology, Syracuse University, Syracuse, New York, 1996

PROFESSIONAL REGISTRATION/CERTIFICATION

Professional Geologist: Idaho #PGL-1453, Texas # 11440, Wyoming #PG-3602, Nebraska #G-0376

EXPERIENCE

Leonard Rice Engineers, Inc., Denver, Colorado

Groundwater Group Manager—April 2013- Present

Project Manager/Hydrogeologist—December 2010-April 2013

Senior Project Hydrogeologist—June 2010-December 2010

Serving as the Leonard Rice Engineers Groundwater group manager. Technical expertise subject areas include groundwater modeling, surface water/groundwater interaction, groundwater methods in water reuse (riverbank filtration and soil aquifer treatment), aquifer recharge, and subsidence caused by fluid withdrawal.

Mr. Colvin conducts and supervises hydrogeologic investigations, including project management, aquifer characterization and testing, geologic and environmental systems modeling (including MODFLOW groundwater modeling), and water rights support. Groundwater modeling work includes automated calibration (PEST and UCODE), parallel processing, geologic conceptual modeling, and evaluation of model uncertainty. Significant projects include:

- Team leader managing staff, resources, and schedules for a group of hydrogeologists and technicians performing groundwater work.
- Project manager and lead Hydrogeologist for Tarrant Regional Water District investigation into effectiveness of riverbank filtration for water quality improvements along the Trinity River. Project tasks include geotechnical, hydrogeologic, and geophysical field investigation, groundwater modeling, and design, construction and testing of riverbank filtration pilot test sites.
- Serving on the Eastern Snake Plain Hydrologic Modeling committee and participating in the support and oversight of MODFLOW modeling activities in the Eastern Snake Plain. Expert witness in support of a water rights hearing (IDWR Case No. CM-DC-2011-004) involving complex surface water and groundwater interaction of the Eastern Snake Plain Aquifer.
- Development of regional MODFLOW models used to estimate well field yield and land subsidence due to fluid withdrawal in Arizona. Work included aquifer characterization, lithologic modeling, model development, automated model calibration and predictive uncertainty analysis using PEST, subsidence modeling with the SUB-WT package, and evaluation of subsidence related observations and empirical relationships.
- Review of USGS Northern Arizona Regional Groundwater Flow Model.
- Expert witness providing hydrogeology support of water rights for a Boulder County Parks and Recreation augmentation pond.
- Review of several different models along the South Platte River and its' tributaries in support of, or objection to, water rights cases.
- Support of groundwater development projects along the Colorado Front Range.

Geomega, Boulder, Colorado*Hydrogeologist—2009-2010*

Hydrogeologist providing MODFLOW modeling in support of alluvial recharge and mining related analyses. Provided detailed water balance studies including point flow surface water modeling to evaluate stream gain/loss; net recharge groundwater inputs incorporating precipitation, irrigation, evapotranspiration; well inventories and pumping estimates; groundwater underflow assessments. Performed PEST automated model calibration in a parallel processing environment.

Tetra Tech, Longmont, Colorado*Hydrogeologist—2004-2009*

Provided hydrogeologic support for the City of Aurora's Prairie Waters project near the South Platte River, Colorado. Regulatory and litigation support included the design of a leak test monitoring system, MODFLOW modeling support for the Prairie Waters Project included development of regional MODFLOW groundwater model for Colorado Division 1 case 2006CW104. Performed parallel processing model calibration using UCODE. Prepared expert and rebuttal reports, exhibits and materials used in settlement negotiations for case 2006CW104.

Field investigation and construction tasks included field oversight of drilling, well construction, pump/motor installation, aquifer testing, system start up testing, well field yield optimization, and geotechnical investigations. Support also included the design, construction, and operation of alluvial recharge and riverbank filtration pilot test facilities. Developed and implemented pilot test procedures, including tracer studies to assess flow paths, travel times, and stream/aquifer interaction.

Other projects include hydrogeologic support for abandoned mine hydrology and geochemistry, groundwater modeling to support water development and management, well design, oversight of drilling and well installations, sampling, geographical information systems, permitting and regulatory agency interaction.

MFG, Inc., Boulder, Colorado*Environmental Geologist—2000-2004*

Provided hydrogeological and environmental support for investigation, monitoring and remediation of mines, processing, hydrocarbon, and other non-aqueous phase liquid contamination sites. Services included field investigations of soil, water, and air; sample analysis; data management; data analysis; reporting; GIS; permitting and regulatory agency interaction.

Roy F. Weston, Lakewood, Colorado*Environmental Geologist—1998-2000*

Conducted field investigations at the former Stapleton International Airport in Denver, Colorado to define nature and extent of free-phase and dissolved-phase hydrocarbon contamination. Tasks included lithologic logging with hollow-stem auger and direct-push drilling rigs; soil, groundwater, and vapor testing; operation and maintenance of remediation equipment; data evaluation and reporting.

National Park Service, Longmire, Washington*Aquatic Biologist—1996-1997*

Crew leader for an aquatic ecosystem survey in Mt. Rainier National Park conducting sub-alpine wetland surveys. Performed aquatic field sampling and testing, wetland classification, biological species identification, and aquatic laboratory analyses.

EDUCATION

B.S., Civil Engineering, Colorado State University, Fort Collins, 2007

PROFESSIONAL REGISTRATION

Professional Engineer, Colorado, #46309

EXPERIENCE

Leonard Rice Engineers, Inc., Denver, Colorado

Project Engineer—2008-present

Project Engineer specializing in designing and evaluating wastewater collection systems, water distribution system projects, irrigation inlet and outlet systems, opinions of probable cost, contract administration, and construction observation. Chris is responsible for designing new and replacement infrastructure systems, as well as evaluating existing infrastructure systems and prioritizing system repairs for wastewater collection systems and water distribution systems. Chris also designs ditch structures, ditch linings, flow measurement devices, recharge ponds, and pressurized water distribution lines.

Central Colorado Water Conservancy District Recharge Pond Designs: Project engineer for the design of multiple recharge ponds located in central Colorado. The recharge ponds range in size from 1.5 acres to 17 acres with sedimentation basins to minimize sediment build up in the recharge ponds. Responsible for design, construction documents, and erosion and sediment control plan.

Greeley Loveland Irrigation Company Diversion Structure: Staff engineer for the expansion of an existing diversion structure in Greeley. The expansion included a Rubicon Flume Gate to control the amount of flow diverted from the channel. Responsibilities included design, construction documents, coordination with Rubicon, and construction observation.

Canon City Hydraulic Ditch Lining: Staff engineer for the lining of the Hydraulic Ditch in Canon City. The ditch was lined to minimize losses in the system that caused erosion on the berms of the ditch. Responsibilities include data collection, design and contract administration.

FIDCO Check Structure: Staff Engineer for a new check structure on the FIDCO Canal by the Frank Ponds. The check structure is designed to server and existing diversion structure. Collected data and performed the design drawing.

MS4 Program Audit for Confidential Client: Project engineer for an audit of a client's Municipal Separate Storm Sewer System program. Tasks included reviewing construction documents for development and capital improvements project, reviewing staff inspection reports, conducting staff interviews, visiting construction sites with staff members, visiting post construction sites with staff members, and compiling findings in and audit report.

Urban Drainage and Flood Control District: Project engineer for ongoing flood chasing services. After flood events within the District, collects field data and document effects of the flooding. Responsibilities include field data collections, flow estimating, documentation of damage, documenting high water lines, comparing flow estimates to data collected by gages, and preparing a report to the District about the effects of the flood.

Black Hawk/Central City Sanitation District Ongoing Services: Project engineer for ongoing engineering services for the collection system that serves the Cities of Black Hawk and Central City. Responsibilities include design, design review, construction documents, contract administration, construction observation / documentation, and infrastructure evaluations of sanitary sewers ranging from collectors to interceptors. Projects include Dubois Street main replacement, High Street main replacement, Central City Main Street main replacement, Highway 119 interceptor realignment, Lawrence Street main replacement, and 2013 BHCCSD Manhole Rehabilitation.

Aspen Consolidated Sanitation District: Project engineer for ongoing engineering services for the collection system that serves the City of Aspen. Responsibilities include design, construction documents, contract administration, construction observation / documentation for sanitary sewer projects ranging from collectors to interceptors. Projects include Skimming Lane main extension, Aspen Valley Hospital main realignment, Knollwood main installation, Aspen Airport Business Center "B-Line" Replacement, Galena Street sanitary sewer replacement, and Aspen Club sanitary sewer replacement.

Berry Creek Well No. 3 Pipeline: Project engineer for the design of a 1000 foot long water line to connect Berry Creek Well No. 3 to a recently build well house. Due to the level of corrosive materials in the soil the pipeline had to be designed with a cathodic protection system to prolong the life span of the pipe.

Cherry Creek Basin Water Quality Authority: Project engineer for ongoing engineering services including the Authorities Annual Report on Activities. Works with MS4s located in the Cherry Creek Basin to compile construction and post-construction inspections information, as well as information about enforcement actions at these sites. Also documents public education and outreach conducted within the basin, revisions to regulations and their effect on the Authority, funding, and regulated stormwater source control. Project engineer responsible for reviewing lift station site approvals submitted with in the Cherry Creek Basin.

S.A. Miro, Inc., Denver, Colorado

Design Engineer—2007-2008

Design Engineer for the design of potable water, sanitary sewer, and storm sewer utilities as well as the site grading for new developments. Responsible for the design of distribution and collection systems for potable water and sanitary sewer utilities as well as the connections to the existing potable water and sanitary sewer systems that serve the developments. Graded sites and designed storm sewer systems to collect storm runoff and direct it to designed BMPs that reduced pollutants prior to discharging the storm water.

CERTIFICATIONS

Cured In Place Pipe Inspector, NASSCO, #CIPP-413-1033

PROFESSIONAL ACTIVITIES

American Public Works Association (APWA)

American Society of Civil Engineers (ASCE)

EDUCATION

M.S., Geological and Environmental Sciences- Hydrogeology, Stanford University, Palo Alto, California, 2008

B.A., Summa Cum Laude in Geology; Minor: Atmospheric and Oceanic Sciences, University of Colorado, Boulder, Colorado, 2005

PROFESSIONAL REGISTRATION

Professional Geologist, Wyoming, #PG-3902

EXPERIENCE

Leonard Rice Engineers Inc.

Project Hydrogeologist January 2014 - Present

Staff Hydrogeologist - February 2013 - December 2013

Specializing in the integration of geological, hydrogeological, and field data into useful groundwater flow models to evaluate project feasibility, potential water supply, and water rights planning, aquifer characterization utilizing analytical and numerical methods. Analysis of aquifer storage and recovery potential, riverbank filtration, tributary/nontributary determinations, discharge monitoring sampling and reporting to CDPHE.

Significant projects include:

- Hydrogeological modeling for Tarrant Regional Water District investigation into riverbank filtration feasibility analysis including evaluation of travel time, and bank storage benefits from riverbank filtration.
- Groundwater modeling and field manager for water supply project for the Penrose Water District. Project involved well installation and hydrogeological analyses in the alluvium adjacent to the Arkansas River for municipal water supply including monitoring for CDPHE discharge permitting.
- Groundwater Modeling for Eagle River Water and Sanitation District wells including stream depletion timing and stream-aquifer interactions for water rights and water quality related issues.

SRK Consulting

Staff Hydrogeologist - 2011-2013.

Regional and site-specific groundwater flow and transport modeling. Open pit and underground mine water management. Implementation of complex pump testing in extreme environments and analyses to determine hydrogeological parameters. Numerical modeling of mine water issues.

Significant projects include:

- Field investigation of hydrogeological regime at potential underground potash mine in the Republic of the Congo.
- Field investigations including packer testing followed by MODFLOW groundwater modeling at an active underground gold mine in central Alaska.

Martin and Wood Water Consultants

Staff Hydrogeologist - 2008-2011

Regional and site-specific ground water flow and transport modeling including expert testimony before the state engineer, stream depletion assessments and tributary/nontributary determinations for alluvial and bedrock aquifers, dewatering system analyses and modeling. Surface water evaluation including water budget analyses, consumptive use analyses, water rights applications and changes, augmentation plans, and GIS applications.

Significant projects include:

- Lead research and expert testimony before the Colorado State Engineers Office for successful Nontributary determination for CBM produced water from the Neslen Formation in Northwestern Colorado.

PROFESSIONAL ACTIVITIES

Colorado Groundwater Association Member.

PUBLICATIONS / PRESENTATIONS

- Bauer, J.P., and Martin, P.L (2011) Technical Aspects of Successful Nontributary Determinations in the Neslen Formation and Sand Wash Basin, CO. Colorado Groundwater Association Seminar Series: Oil Gas, and Water- How Do the Mix in Colorado? Presented June 17, 2011.
- Bauer, J.P. (2008), Update to Regional Groundwater Flow Simulation of Sonoma Valley Including a New Model for Recharge and Three Future Scenarios. Master's Thesis- Stanford University.
- Bauer, J.P., Winfrey, B.K., Grunewald, E.D., Lakshmi, V. (2007). Integrating Remotely Sensed Data for Water Budget Studies in the San Luis Basin, Colorado. Eos, v. 88, no. 52, Fall Meet. Suppl., Abstract, H31A- 0130. AGU Outstanding Student Paper Award.
- Bauer, J.P., Quantifying Salt Cedar Water use and Evaluating Control Measures as a Means of Water Conservation along the Cimarron River, Kansas. Honors thesis- University of Colorado at Boulder.
- Neupauer, R.M., Colvin, D.C., Bauer, J.P. (2014). Novel Modeling Approaches to Assess Feasibility of Riverbank Filtration.
- Colvin, D.C. and Bauer, J.P. (2013). Cost Effective Feasibility Investigation of Natural Subsurface Reuse Treatment Systems. Poster session at the 2013 National Water Reuse Symposium, Denver, CO.

EDUCATION

B.S., Environmental Engineering and Science, Colorado School of Mines, Golden, 2010

PROFESSIONAL REGISTRATION

Engineer in Training, #5635

EXPERIENCE

Jojo provides technical expertise for projects concerning a diverse range of topics that include regulatory compliance, data analysis and management, pollutant tracking and loading analyses, and water supply planning and development. Significant project tasks include the Gore Creek Water Quality Improvement Plan data compilation and analysis, the Eagle River/Gore Creek Nutrient Study compliance and regulatory testimony data analysis, Tarrant Regional Water District nutrient removal analysis through riverbank filtration, and the Black Hawk/Central City Sanitation District wastewater treatment facility nutrient tracking. Each of these projects required the compilation and gathering of data from local, State, and Federal databases, data analysis and interpretation, and compliance with regulations. For the Eagle River Water & Sanitation District, Jojo assists in nutrient monitoring, developing a sampling and analysis plan for nutrients, and making future monitoring plan recommendations. She specializes in data analysis and loading calculations, and is able to present data graphically for identifying trends and water quality concerns. Jojo's previous work included internal stormwater inspections for aggregate, asphalt, and concrete Lafarge North America Aggregates & Concrete sites in Colorado and Wyoming. She helped implement stormwater compliance standards to meet federal Clean Water Act regulations. The inspections included ensuring that there were no unpermitted discharges, there were adequate best management practices in place, and she kept records of stormwater compliance and monitoring.

WORK HISTORY

Leonard Rice Engineers, Inc.

Staff Engineer—2011-present

Eagle River Water and Sanitation District – Assisted in the development of a Water Quality Improvement Plan for Gore Creek, including the analysis of stormwater, snowmelt, and rain runoff sampling data, nutrient data, and water chemistry data. Participated in the development of numeric nutrient stream standards for discharge permits (Regulation 31 and 85) and alternative limits for the Vail, Avon, and Edwards Wastewater Treatment Facilities.

City of Black Hawk and Black Hawk Central City Sanitation District – Assisted in the Review of the wastewater treatment facility discharge permit for renewal and conducted a water quality analysis, including AMMTOX modeling to assess impacts of new stream standards for ammonia, tracking of stream standards for temperature, nutrients, and metals and tracking of phosphorus and total inorganic nitrogen to ensure compliance with Standley Lake Cities stipulation for water transfers.

Tarrant Regional Water District, Tarrant County, Texas – Evaluated the technical feasibility of utilizing riverbank filtration for the reduction of nutrients in the Trinity River, including a water quality improvements analysis for the effects of riverbank filtration. Developed a sampling and analysis plan for water quality monitoring in the Trinity River and in monitoring wells.

Southern Ute Indian Tribe

Developed nutrient criteria for Los Piños River for the establishment of both narrative and numeric nutrient criteria. Conducted an analysis and assessment of nutrient data for the determination of nutrient criteria including nutrient loading calculations and the effects of nutrients on aquatic life.

International Center for Appropriate and Sustainable Technology, Lakewood, Colorado

Environmental Engineering Fellow—August-October 2011

Conducted a feasibility study for the Colorado Department of Agriculture on septic waste treatment in Delta, Colorado.

RESEARCH/PROJECT EXPERIENCE

CSM AQWATEC: Environmental Research Assistant. Riverbank filtration simulation for wastewater treatment as contracted by CH2M Hill. Bulk water analysis, extractions for trace organics, safety training in hazardous wastewater.

SKILLS

Computer: AutoCAD, FORTRAN, Solid Works, MathCAD, HEC-RAS, EPA SWMM, ArcGIS, Minitab, LabView, Adobe Photoshop, Microsoft Office: Word, Excel, PowerPoint

Acts/Safety: Knowledge/education on CERCLA, RCRA, OSHA standards, EPA regulations, environmental toxicology

Technical: Finite element analysis, computer aided data acquisition, hydraulic analysis, field sampling, design of water/wastewater related structures, budgeting, scheduling, work break-down structure development, failure modes & effects analysis, proposal writing, presenting/public speaking

Languages: Spanish (fluent), Chinese (moderate)

PROFESSIONAL ACTIVITIES

American Water Works Association
 Rocky Mountain Water Environment Association
 Public Education Committee Member
 American Water Resource Association (AWRA)
 Colorado Lake & Reservoir Management Association

EDUCATION

B.S., Civil Engineering, Colorado State University, Fort Collins 2013

PROFESSIONAL REGISTRATION

Certified Engineering Intern, Colorado, #70123

EXPERIENCE

Leonard Rice Engineers, Inc., Denver, Colorado

Intern – May 2012 – August 2013

Staff Engineer – January 2014 – present

Responsible for hydraulic calculations, HEC-RAS, AutoCAD Civil 3D, infrastructure design, infrastructure assessment, creation of construction documents and specifications, and construction observation.

Pleasant Valley Farms Riverbank Stabilization: Staff engineer assisting with alternative analysis to restore riverbank damage from September 2013 flood. The alternatives included regrading and armoring the bank, restoring the bank to approximate pre-flood conditions (approximately 20 feet), and restoring an approximate 40-60 foot width of bank. A combination of structural and biological stabilization methods were used. Responsibilities included preliminary design of three separate riverbank restoration alternatives and final design of selected alternative.

Beaver Creek Snowmaking Intake Improvements: Staff engineer assisting with diversion alternative analysis to evaluate concepts for intake improvement to mitigate frazil ice and increase intake capacity. The alternatives included modifying existing gate and traveling screen, adding a skimming weir, and adding a gate and intake weir downstream of the existing intake structure. Responsibilities included design and comparison of intake improvement alternatives.

Black Hawk/Central City Sanitation District 2013 Manhole Rehabilitation: Staff engineer for 2013 BHCCSD Manhole Rehabilitation project that included evaluation of manhole rehabilitation methods, recommendation of acceptable rehabilitation methods, evaluation of existing manhole lining systems, creations of construction plans and specifications, construction observation, and project coordination.

Black Hawk/Central City Sanitation District Ongoing Services: Staff engineer for ongoing engineering services for the collection system that serves the Cities of Black Hawk and Central City. Responsibilities include design, construction documents, construction observation, and infrastructure evaluation of sanitary sewers ranging from collectors to interceptors.

Aspen Consolidated Sanitation District Ongoing Services: Staff Engineer for ongoing services for the collection system that serves the City of Aspen. Responsibilities include design, construction documents, and construction observation for sanitary sewer projects ranging from collectors to interceptors. Projects include Aspen Airport Business Center "B-Line" Replacement, Galena Street sewer replacement, and Ute Avenue sewer replacement.

PROFESSIONAL ACTIVITIES

American Public Works Association (APWA)

President/Owner:

- **J&T Consulting, Inc.**
305 Denver Avenue
Suite D
Fort Lupton, CO 80621
Ph: 303-857-6222
Fax: 303-857-6224
Cell: 720-235-7334
jasonmurray@j-tconsulting.com

Education:

- BS / Civil Engineering,
University of Colorado–
Boulder / 1997

Registrations:

- Engineer in Training State
of Colorado

- Survey Intern,
State of Colorado

Professional Affiliations:

- Associate Member of
American Society of Civil
Engineers

Specific Project Experience

City of Northglenn Water Bull Reservoir Emergency Repair

The City of Northglenn retained JT to assist them with project management and administering their construction contract for the emergency repair to their Bull Reservoir



at the Northglenn Wastewater Treatment Facility. The reservoir was originally constructed with an asphalt liner. An area of the asphalt liner failed in the south cell of the reservoir, requiring that the reservoir be drained so that repairs to the liner could be completed. The City had to complete an emergency relocation of their effluent discharge pipeline to temporarily move the discharge to a location outside of the repair area. The reservoir was dewatered using the existing pump station to an elevation below the repair area.

After consultation with City staff to determine treatment process, required water storage to meet augmentation demands, emergency shutdown time frames, and discussions the City had previously conducted with regulatory agencies JT compiled a list and layout of potential alternatives. Alternatives were discussed with City staff and JT then conducted a project team discussion meeting to involve all of the team members including the proposed contractor, design engineer, State Engineer's Office, Colorado Department of Health and Environment, and City staff to further evaluate the ramifications of five different alternates.

To evaluate the potential costs associated with the alternates JT recommended that an asbuilt survey of the reservoir be done to determine the elevations of the pump station outlet, reservoir bottoms of the two reservoir cells, and liner failure area. The survey enabled JT to determine the storage characteristics of the two reservoir cells and a proposed dewatering plan for the reservoir. The City maintained a minimum amount of available storage in the reservoir in order to operate their wastewater facility during the repair. The original proposed repair involved installing a hydro-barrier coffer dam separating the repair area from the reservoir to allow the liner repair to be constructed in the south cell.

It was discovered through the survey that the elevation of the pump station outlet was significantly higher than the elevations of the reservoir cell bottoms. This would not allow the reservoir to be drained to a level that would permit the hydro-barrier to be installed in a cost effective manner while still providing the required storage needed for the operation of the wastewater

facility once the hydro-barrier was installed. JT investigated numerous alternative methods of constructing coffer dams and diversion piping for the effluent discharge in order to meet the City's budget and maintain the ability to construct the repairs. Jason Murray was the JT project manager and provided design and day to day CM / observation services.

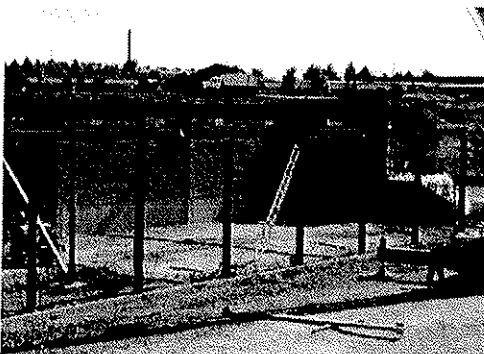
City of Northglenn Water Treatment Facility Upgrades and Terminal Reservoir Storage Repair

JT has been retained to perform construction management services for the Terminal Storage Reservoir Outlet Line Repair. In November 2012 the Terminal Storage Reservoir 36" outlet pipe failed due to corrosion. The repair of the dam outlet works consists of lining the existing pipe, new downstream and upstream control structures and connections to the Standley Lake Pipeline Bypass line. A construction sequence has been developed that will allow the repairs to be made without interrupting water supply to the existing treatment facility.



JT has recently been retained to assist with the Construction Management of the Northglenn Water Treatment Facility Expansion. The expansion involves construction of a new Chemical Feed Building and several Chemical Feed systems as well as new a flocculation basin. The construction of the new facility improvements must be closely sequenced with the Terminal Storage Repairs to avoid water supply interruptions

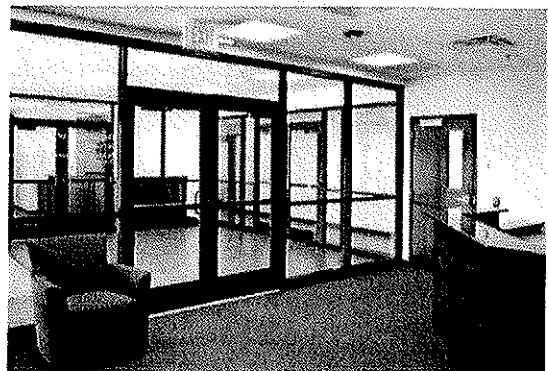
City of Westminster Municipal Service Center Renovation



Jason provided owner's representative/construction management services to assist them with completing the renovation of their Municipal Service Center complex. The project was funded through the Capital Improvement Projects Division. The project was an 11.2 million dollar complete renovation of the existing Administration and Operations buildings (approximately 50,000 s.f.), the construction of a new 20,000 s.f. masonry vehicle and road salt storage facility, a new car wash, weld shop addition to the fleet maintenance facility, mechanical/electrical upgrades to the existing vehicle storage buildings, communication and security system upgrades, site utility, pavement, and drainage improvements.

JT initially assisted with developing a project management plan that included recognizing and identifying as well as maintaining an action item list, risk management plan, budget tracking plan, and project schedule. JT assisted the City with value engineering options that allowed the final design phase to be completed such that the project budget could be maintained and a guaranteed maximum price (GMP) construction contract could be reached.

Additional services provided included managing the City's design consultants, ensuring the Owners interest in the project, responding to design changes, assistance with the CM/GC negotiations, and providing a point contact between the design consultants, City staff and the Contractor. Services provided during the construction phase included maintaining an onsite presence during construction, review and approval of payment applications, budget management, value engineering, coordinating design changes, ensuring requests for information were being processed, and review/approval of payment applications and change order proposals. The project was completed in December 2008. The completion was two months ahead of schedule and within the GMP budget.



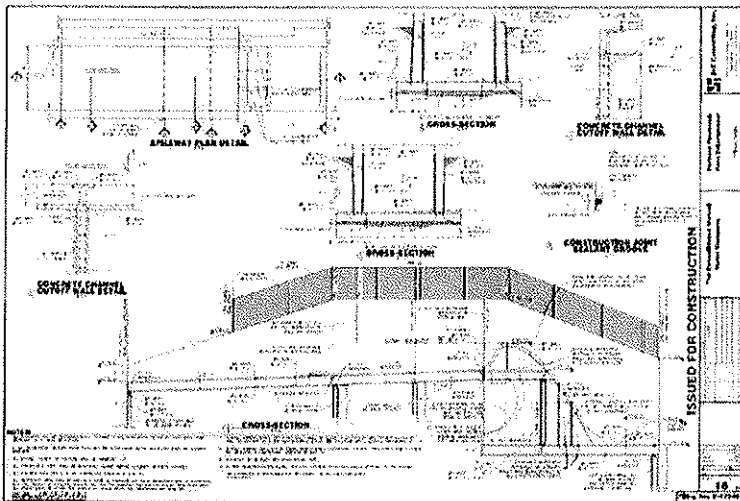
Cities of Westminster, Northglenn, and Thornton Standley Lake Dam Improvement Project

The Standley Lake Dam Rehabilitation project was a \$36 million dollar rehabilitation project that incorporated a new labyrinth spillway and RCC/rip-rap lined spillway channel, 1200 feet of conventional tunneling, 1800 feet of micro tunneling under the lake, 120' vertical by 30' diameter valve shaft construction, over 5000 feet of 36" to 102" steel mortar lined pipe, stability berm construction, and construction of new outlet works conduits, buildings, and related infrastructure.



Responsibilities included insuring the Owners interest in the project and maintaining an onsite presence during construction, review and approval of payment application, responding to design changes, and providing a point contact between the design team and engineers, the staff of three cities, and the Contractor. The project finished 4 months ahead of schedule and approximately 4% under budget.

The Consolidated Mutual Water Company Fortune Reservoir Enlargement



J&T Consulting, Inc. was retained by **The Consolidated Mutual Water Company** to develop preliminary and final engineering design submittals for the enlargement of the Fortune Dam and Reservoir for the Office of the State Engineer (SEO). Approval was obtained from the SEO in the winter of 2011 to raise the embankment seven feet via a combination of earth fill and concrete walls to gain an additional 800 acre feet of storage. To accommodate the increased embankment height the existing concrete spillway was removed and replaced with a new spillway and wing walls to a higher elevation. The embankment north of the spillway was

raised using earth fill, while the embankment to the south of the spillway was raised using a concrete wall. JT served as the on-site resident engineer and the Owner's onsite representative and construction manager during the construction phase of the project, which was completed in September 2011. The construction was done while water remained in the reservoir by a implementing an earthen coffer dam to isolate the spillway and northern abutment areas while they were constructed. Improvements were also done to the spillway discharge channel to accommodate the new spillway structure.

Experience Summary

Jason's field is Owners representation, project management, program development, and design and construction of civil projects. His engineering experience remains diverse, with project experience in municipal engineering, mine permitting, reservoir design and construction, drainage and hydraulics, construction management, roadway and pipeline design, structural steel and concrete design, and residential and commercial site development.

