



SDMS Doc ID 2027872



"Gaddy, Alan"  
 <GaddyA@repsilverstate.com>

05/15/2003 03:43 PM

To: David Basinger/R9/USEPA/US@EPA  
 cc: Hugh Barroll/R9/USEPA/US@EPA, "Welsh, Blaine"  
 <Blaine.Welsh@usdoj.gov>, John Rothman/R9/USEPA/US@EPA,  
 Steve Wall/R9/USEPA/US@EPA, "SandraDoty@aol.com"  
 <SandraDoty@aol.com>, "Barringer, Steve" <Steve@mgninc.com>,  
 "dpatterson@bdlaw.com" <dpatterson@bdlaw.com>, "Gardner, Tom"  
 <GardnerT@repsilverstate.com>, "Lundell, Clarke"  
 <LundellC@repsrv.com>, "Kalish, Steve"  
 <KalishS@repsilverstate.com>, "Carrie Stowers (E-mail)"  
 <CXW@co.clark.nv.us>, "Alan Pinkerton (E-mail)"  
 <AZP@co.clark.nv.us>

Subject: May 5 follow-up

Hi David.....In my e-mail of May 5, which included an attachment describing an update of Exponents work activity at the Sunrise Landfill, Exponent referred to Kleinfelder and Ruen as contractors involved on behalf of Exponent. Attached are their respective SOQ's for your approval in this project. Please call me if you have any questions.....Thanks.....Alan

Alan J. Gaddy  
 Republic Services of Southern Nevada  
 770 E. Sahara Avenue  
 Las Vegas, Nevada 89104  
 (702) 644-4210 x 237  
 Fax (702) 735-4523  
 GaddyA@ RepSilverState.com

-----Original Message-----

From: Gaddy, Alan  
 Sent: Thursday, May 15, 2003 3:31 PM  
 To: 'Basinger.David@epamail.epa.gov'  
 Cc: 'Barroll.Hugh@epamail.epa.gov'; 'Welsh, Blaine';  
 'Rothman.John@epamail.epa.gov'; 'wall.steve@epamail.epa.gov';  
 'SandraDoty@aol.com'; 'Barringer, Steve'; 'dpatterson@bdlaw.com';  
 Gardner, Tom; Lundell, Clarke; Kalish, Steve; 'Carrie Stowers (E-mail)';  
 'Alan Pinkerton (E-mail)'  
 Subject: RE: May 12 telecon follow up

Hi David, Also during our telecon, you had requested simple quick drawing to reflect the new location of the NE Canyon Basin proposed location. Attached is that drawing. Please call me if you have any questions. It was quickly and simply done.....Thanks.....Alan

Alan J. Gaddy  
 Republic Services of Southern Nevada  
 770 E. Sahara Avenue  
 Las Vegas, Nevada 89104  
 (702) 644-4210 x 237  
 Fax (702) 735-4523  
 GaddyA@ RepSilverState.com



Ruen soq.pdf



Kleinfelder soq.pdf

STANDARD FORM (SF)

254

Architect-Engineer and Related Services Questionnaire

**1. Firm Name/Business Address**  
 Ruen Drilling, Inc.  
 2320 River Road (P.O. Box 267)  
 Clark Fork, Idaho 83811

**1a. Submittal is for**  Parent Company |  Branch or Subsidiary Office

**2. Year Established**  
 1974

**3. Date Prepared**  
 February 10, 2003

**4. Specify type of ownership and check below if applicable**  
 Corporation

A. Small Business  
 B. Small Disadvantaged Business  
 C. Women-owned Business

**5a. Name of Parent Company, if any**  
 N/A

**5b. Former Parent Company Name(s), if any and Years Established**  
 N/A

**6. Name of Estimator/Chief Estimator to Contact (if applicable)**

1) Byron Ruen, President (208) 266-1151  
 2) Arlan Ruen, Vice President (208) 266-1151

**7. Present Office City/State/Zip/Phone and Personal Cell Office (if applicable)**

Clark Fork, Idaho / (208) 266-1151 / 21

**8. Firm's employees by discipline (check all that apply, check primary discipline)**

<input checked="" type="checkbox"/> Administrative	<input type="checkbox"/> Electrical Engineers	<input type="checkbox"/> Oceanographers	<input checked="" type="checkbox"/> Supervisors
<input type="checkbox"/> Architects	<input type="checkbox"/> Estimators	<input type="checkbox"/> Planners: Urban/Regional	<input checked="" type="checkbox"/> Foreman
<input type="checkbox"/> Chemical Engineers	<input type="checkbox"/> Geologists	<input type="checkbox"/> Sanitary Engineers	<input checked="" type="checkbox"/> Drillers
<input type="checkbox"/> Civil Engineers	<input type="checkbox"/> Hydrologists	<input type="checkbox"/> Soils Engineers	<input checked="" type="checkbox"/> Drill Helpers
<input type="checkbox"/> Construction Inspectors	<input type="checkbox"/> Interior Designers	<input type="checkbox"/> Specification Writers	<input checked="" type="checkbox"/> Clerical
<input type="checkbox"/> Draftsmen	<input type="checkbox"/> Landscape Architects	<input type="checkbox"/> Structural Engineers	
<input type="checkbox"/> Ecologists	<input type="checkbox"/> Mechanical Engineers	<input type="checkbox"/> Surveyors	
<input type="checkbox"/> Economists	<input type="checkbox"/> Mining Engineers	<input type="checkbox"/> Transportation Engineers	

**9. Summary of Federal Services Fees Received (check all that apply)**

(Insert index number)	2002	2001	2000	1999	1998
Direct Federal contract work, including overseas					
All other domestic work	6	6	6	6	6
All other foreign work*					

\*Firms interested in foreign work, but without such experience check here:

**Ranges of Professional Services Fees INDEX**

1. Less than \$100,000
2. \$100,000 to \$250,000
3. \$250,000 to \$500,000
4. \$500,000 to \$1 million
5. \$1 million to \$2 million
6. \$2 million to \$5 million
7. \$5 million to \$10 million
8. \$10 million or greater

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RUEN DRILLING

2002

Profile Code	Number of Projects	Total Gross Fees (in thousands)	Profile Code	Number of Projects	Total Gross Fees (in thousands)	Profile Code	Number of Projects	Total Gross Fees (in thousands)
1) 201	238	13,056	11)			21)		
2) Drilling			12)			22)		
3) Services			13)			23)		
4)			14)			24)		
5)			15)			25)		
6)			16)			26)		
7)			17)			27)		
8)			18)			28)		
9)			19)			29)		
10)			20)			30)		

Profile Code	"P", "C", "JV", or "IE"	Project Name and Location	Owner Name and Address	Cost of Work (in thousands)	Completion Date (Actual or Estimated)
201	P	1 Ken Snyder Mine Midas, Nevada Core drilling for mineral exploration	Midas Joint Venture 6151 Lakeside Drive Suite 2100 Reno, Nevada 89511	1,126	12-98
201	P	2 CUP McCook Reservoir Project Chicago, Illinois Geotechnical coring for underground sewer surge facility	Patrick Engineering, Inc 4985 Varsity Drive Lisle, Illinois 60532	436	9-98
201	P	3 Spanish Fork Tunnel Project Spanish Forks, Utah Geotechnical Coring, Packer Testing & Instrumentation	Woodward Clyde / Bureau of Reclamation 4582 S. Ulster Street #1000 Denver, Colorado 80237-2664	259	10-98
201	P	4 Geologic and Geotechnical Investigations Contract - L A California / Geotechnical deep core drilling, with packer testing and well installations	City of Los Angeles, Dept. of Water & Power P.O. Box 111 Los Angeles, California	104	12-98
201	P	5 Geotechnical Service Contract (Statewide) Geotechnical investigation for highway projects	Washington Department of Transportation P.O. Box 167 Olympia, Washington 98504	99	12-98
201	P	6 Light Rail Project / Seattle, Washington Geotechnical drilling and instrumentation for tunnel project	Fujitani Hilts & Associates / Sound Transit 2255 SW Canyon Road Portland, Oregon	226	1-99
201	P	7 Midnight Mine / Wellpinit, Washington Environmental monitoring well and pump wells for environmental remediation	Dawn Mining Company P.O. Box 250 Fond, Washington 99013-0250	252	2-99

201	P	8 Lametfoot Mine Republic, Washington Monitoring Well installations for gold mine expansion	Echo Hay Minerals 921 Fish Hatchery Road Republic, Washington 99166	03	1-99
201	P	9 Geologic and Geotechnical Investigations Contract L.A. California Geotechnical deep core drilling, with packer testing and well installations	City of Los Angeles, Dept. Water & Power P.O. Box 111 Los Angeles California	26	7-99
201	P	10 Howard Hanson Dam Project / Enumclaw, WA. Geotechnical Drilling for fish ladders and tunnel design	Andrew Well Drilling / U.S. Army Corps of Engineers 1268 East 17 <sup>th</sup> Street Idaho Falls, Idaho 83404	96	8-99
201	P	11 Geotechnical Service Contract (Statewide) Geotechnical Investigation for highway projects	Washington Department of Transportation P.O. Box 167 Olympia, Washington 98504	74	8-99
201	P	12 Dawn Millsite / Ford, Washington Environmental monitoring well and pump wells for environmental remediation.	Shepherd Miller, Inc. 3801 Automation Way, Ste 100 Fort Collins, Colorado 80525	67	8-99
201	P	13 Horizontal Drainhole Project Keller, Washington Horizontal Drain Holes for dewatering landslide	Washington Department of Transportation P.O. Box 167 Olympia, Washington 98504	29	8-99
201	P	14 Core Drilling Project San Luis Obispo, California Coring for aggregate source	Madonna Construction 100 Madonnas Road San Luis Obispo, California 93405	13	12-99
201	P	15 Mica to Belgrove to Worley Highway Project US Hwy 95 - Improvement Geotechnical investigation for highway project	CH2M Hill / Idaho Dept. of Transportation 700 Clearwater Lane Boise, Idaho 83712	123	9-99
201	P	16 North Leg North Block Tailings Dam Facility Carlin, Nevada / Mud rotary geotechnical drilling for dam foundation investigation	Barrick Goldstrike Mines, Inc. P.O. Box 29 Elko, Nevada 89803	27	10-99
201	P	17 Ken Snyder Mine Midas, Nevada Core drilling for mineral exploration	Midas Joint Venture 6151 Lakeside Drive, Suite 2100 Reno, Nevada 89511	1,259	10-99
201	P	18 Caltrans Tupanga Canyon Project Malibu, California Air coring and slope inclinometer installation	HDR Engineering, Inc. / Caltrans One City Boulevard West, Suite 900 Orange, California 92868	81	10-99
201	P	19 Las Vegas Wash Crossing Las Vegas, Nevada Mud rotary drilling for shaft design	Converse Consultants 731 Pilot Road, Suite H Las Vegas, Nevada 89119	20	12-99

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RIEN DRILLING

2004

201	P	20	Oliverhan Dam, San Diego County Water Authority Drilling of geotechnical holes including packer testing and piezometer installation	Kiewit Pacific / San Diego Water Authority 1236 World Trade Drive #108 San Diego, California 92128-3787	78	2-00
201	P	21	Mud rotary drilling, sampling and installation of piezometers	City of Los Angeles / Dept. of Water & Power 300 Mandelst Street Bishop, California 93514	24	9-00
201	P	22	Dawn Millsite Mine Environmental drilling / Installation of monitoring and pump wells	Shepherd Miller, Inc. 1801 Automation Way, Ste 100 Fort Collins, CO 80525	49	9-00
201	P	23	Geotechnical Drilling Services Contract - Statewide - Geotechnical investigation for highway projects.	Washington Dept. of Transportation P.O. Box 47365 Olympia, Washington 98504-7365	86	12-00
201	P	24	U.S. Hwy 95 Project Geotechnical drilling, including track & truck supported drills. Winter schedule and conditions	Terracon Consultants / Idaho Transportation Dept. 11849 W. Executive Drive, Suite G Boise, Idaho 83713	192	12-00
201	P	25	Howard Hanson Dam Geotechnical coring, including packer testing and installations.	Andrew Well Drilling / U S Army Corps of Engineers 1268 East 17 <sup>th</sup> Street Idaho Falls, Idaho 83404	121	4-00
201	P	26	Geotechnical investigations on proposed San Vicente to Second Aqueduct Tunnel. Drilling included coring of overburden, packer testing, and piezometer installations.	San Diego County Water Authority 3211 Fifth Avenue San Diego, California 92103	430	11-00
201	P	27	Metropolitan Water District / Arrowhead East-West Tunnel Helicopter supported drilling of monitoring well.	San Manuel Band of Mission Indians 1482 E. Enterprise Drive, Building 466 San Bernardino, California 92408	221	3-00
201	P	28	Route 9 - Sha Tin New Town / Ground Investigation Helicopter supported geotechnical inclined & horizontal core borings controlled with downhole steering motors	Geotechnics & Concrete Engineering / Maunsell 6 Ko Shan Road, Hung Hom, KLN Hong Kong	300	3-00
201	P	29	Route 10 - North Lantau to Yuen Long Hwy Helicopter supported geotechnical inclined & horizontal core borings controlled with downhole steering motors	Geotechnics & Concrete Engineering / Mott Connell Ltd 6 Ko Shan Road, Hung Hom, KLN Hong Kong	310	11-00
201	P	30	Picrino Mine - Huaraz, Peru. Geotechnical drilling for tailings dam design and horizontal drainholes for pitwall stabilization	Minera Barrick Misquichilca S.A. Mina Pierina Jr. Juan de la Mata Amno # 446, Huaraz, Peru	227	2-00
201	P	31	Sandpoint, Idaho, North-South By-way project. (ITD) Geotechnical investigation / drilling 200+ feet in soft soils, taking samples and installation of instrumentation	CH2M Hill / Idaho Transportation Dept. 700 Clearwater Lane Boise, Idaho 83712	42	1-01

201	P	32 Drilling investigation on active landslide. Drilling methods required use of air coring	Group Delta Consultants Inc. 4455 Murphy Canyon Road # 100 San Diego, California 92123-4379	43	2-01
201	P	33 Geotechnical investigation with track mounted drill casing advance & coring	NTI Engineering P.O. Box 3269 Great Falls, Montana 59403-3269	64	3-01
201	P	34 SH-5 Chatelet - East Alignment Geotechnical investigation drilling for highway re-alignment.	Kleinfelder, Inc. / ITD 10221 W. Emerald Street, Ste 180 Boise, Idaho 83704	94	4-01
201	P	35 River Mountain, Pumped Storage Project - Delaware Arkansas / Geotechnical investigation for proposed cut and cover tunnel.	Black & Veatch 8400 Ward Parkway Kansas City, Missouri 64114	290	4-01
201	P	36 North East Interception Sewer Project Core investigations, utilizing oriented and scribed core samples.	BC2 Environmental 1212 East Ash Avenue Fullerton, California 92831	46	5-01
201	P	37 Pocatello Loop Project Geotechnical investigation drilling for highway re-alignment.	Golder Associates, Inc. 6165 Ridgeview Court # F Reno, Nevada 89509	24	5-01
201	P	38 Nevada Test Site - Vertical "up" core drilling from underground sites; reaming core holes to 6" diameter for utilities installation.	Raisebor / Bechtel Nevada P.O. Box 999 Aztec, New Mexico 87410	342	6-01
201	P	39 U.S. Gypsum Facility - Sperry, Iowa Drilling and grouting for a raise bore ventilation shaft.	Foundation Engineering Contractors Inc. 2117 Inmel Mine Road Mascot, IN 47806	82	10-01
201	P	40 Upper Diamond Fork Project - Spanish Forks, UT Drilling and grouting for irrigation tunnel inlet shaft.	Obayashi P.O. Box 10 Spanish Forks, Utah 84660	392	12-01
201	P	41 White Sands Missile Range - White Sands New Mexico Drilling horizontal core holes	Merrick & Company 600 Sixth Street, Suite 103 Los Alamos, New Mexico 87544	182	2-02
201	P	42 El Sobrante Landfill - Lake Mathews, California Geotechnical drilling utilizing HQ-3 coring with installation of piezometers.	GeoSyntec Consultants, Inc. 2100 Main Street, Suite 150 Huntington Beach, California 92648	47	2-02

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RUEN DRILLING

008



201	P	43	San Clemente, Island California Geotechnical core drilling on old pier	U.S. Navy / Terracosta Consulting Group 4455 Murphy Canyon Road, Suite 100 San Diego, California 92123-4379	16	4-02
201	P	44	Wharf #3 Port Hueneme Project Drilling and completing borings on pier, using sonic and core methods.	Terracosta Consulting Group 4455 Murphy Canyon Road, Suite 100 San Diego, California 92123-4379	89	7-02
201	P	45	San Vicente Tunnel & Pipeline Project - San Diego CA Geotechnical investigation of proposed tunnel	SDCWA / Southland Geotechnical Consultants 1238 Greenfield Drive, Ste A El Cajon, California 92021	900	8-02
201	P	46	Highway 95 Copeland Section, Bonners Ferry, ID Geotechnical investigation for new highway alignment	ITD / Kleinfelder, Inc. 10221 West Emerald Street #180 Boise, Idaho 83704	428	8-02
201	P	47	Horizontal Dewatering Wells, Auburn, CA Dewatering slope for landslide repair.	PG&E / Taber Consultants 536 Galveston Street West Sacramento, California 95961	48	9-02
201	P	48	Devils Slide Project - Pacifica, CA / Geotechnical investigation of proposed tunnel alignment. Helicopter support, horizontal and vertical borings	Caltrans / Earth Mechanics, Inc. 17660 Newhope Street, Suite E Fountain Valley, California 92708	1,271	10-02
201	P	49	Benicia Bridge Project, San Francisco, California Coring for quality control of bridge piers	Caltrans / Smith-Emery P O Box 880550 San Francisco, California 94188-0550	117	11-02
201	P	50	Olivenhain Dam, San Diego California 6-inch coring of RCC Dam	SDCWA / Kiewit Pacific Company 19090 Via Ambiente, Suite 400 Escondido, California 90929	184	11-02
201	P	51	Buckhorn Grade Project, Redding, California Slope stability investigation for roadway.	MWD / USFS - SHN Consulting 480 Homsted Drive Redding, California 96002	22	12-02
201	P	52	Arrowhead Monitoring Well - San Bernardino, CA Groundwater monitoring for tunnel construction impact.	GeoSyntec 2100 Main Street, Suite 150 Huntington Beach, California 92648	96	12-02
201	P	53	Lake Moreno Project, Lake Murray California Geotechnical investigation for micro tunnel sewer extension.	Terracosta Consulting Group 4455 Murphy Canyon Road, Suite 100 San Diego, California 92123-4379	20	1-03
201	P	54	San Vicente Tunnel & Pipeline, San Diego CA Helicopter supported geotechnical borings, Goodman jack testing, packer testing, piezometer installations.	SDCWA / Southland Geotechnical Consultants 1238 Greenfield Drive, Ste A El Cajon, California 92021	150	1-03

05 09:2003 13:25 FAX 208 266 1379

RIEN DRILLING

008

201	P	55 Lake Hodges Project, San Diego California Geotechnical investigation for proposed tunnel alignment.	SJCWA / MWJH Americas, Inc. 1230 Columbia Street, Suite 750 San Diego, California 92101-8536	150	1-03
201	P	56			
201	P	57			
201	P	58			
201	P	59			
201	P	60			
201	P	61			
201	P	62			
201	P	63			
201	P	64			
201	P	65			

Signature: *Arlan Ruen* Typed Name and Title: Arlan Ruen, V.P. Ruen Drilling, Inc. Date: February 10, 2003

*RUEN DRILLING, INC.*

*CLIENT LETTERS OF REFERENCE*

RSI(ALO)-999/03-02/24



An Integrated Consulting and Services Company

4775 Indian School Road NE, Suite 300  
Albuquerque, New Mexico 87110-3927  
Phone: 505.268.2661 Fax 505.268.0040<http://www.respec.com>

March 18, 2002

To Whom It May Concern:

During January and February of 2002, Ruen Drilling, Inc. of Clark Fork, Idaho was engaged in a drilling program at the White Sands Missile Range in New Mexico. RESPEC was the on-site client's representative throughout the drilling program.

Having been personally involved with similar drilling projects throughout the world, I can attest that this was a particularly challenging project, which required drilling accurate holes into the side of a steep mountain. The rig was set up on slope sides of 30° and more.

Although the ground was highly fractured in places, Ruen achieved core recoveries of +99%. Deviation from bearing and grade was negligible. The drilling location was remote, and drilling water had to be trucked in from a distance.

Considering the difficulties, this was the most successful drilling project with which I have ever been associated. The project was completed on time, within budget, and to the satisfaction of all parties. I especially appreciated the efforts of Pat Schroeder, an extraordinarily skilled driller, and Supervisor Jim Erdman, whose all-around capabilities and innovativeness ensured that the job went smoothly.

I would highly recommend Ruen to any client requiring professional drilling services, especially for jobs where considerable difficulties may be encountered.

Sincerely,

A handwritten signature in cursive script that reads 'Angus Robb'.

Angus Robb  
Engineering and Mine & Field Services

## GeoPentech

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August 23, 2001

Mr. Arlan Ruen  
Ruen Drilling  
300 S. River Road  
Clarke Fork, ID 83811-0267

**SUBJECT: LETTER OF APPRECIATION - CORE DRILLING SERVICES**

Dear Arlan:

The purpose of this letter is to express my appreciation for your support over the last several years. Prior to 1993, I typically obtained core drilling services from a variety of local subcontractors, with mixed success. Things changed in 1993, when you assisted me with the geologic investigation for the Riverside Badlands Tunnel project. For this 8-mile long tunnel project in southern California, for the Metropolitan Water District, a total of about 10,000 feet of core drilling was performed. As you know, drilling conditions were varied, and locally challenging, including soil, soft rock, and hard rock. Your crews handled the drilling challenges well, while achieving both excellent core recovery and advance rates, something that is not very common among drilling firms.

Following your excellent performance on the Badlands Tunnel Project, you worked with us and the Los Angeles Department of Water and Power on the investigation for the Hollywood Water Quality Improvement Project (various tunnels and large underground tanks). Again, your expedient, high-quality work helped make the investigation a success. Most recently, we enjoyed your excellent support on the geologic investigation for the Metropolitan Water District's Lake Mathews outlet facilities project (including tunnels, a shaft, and an offshore outlet tower excavation) where both land-based and offshore core drilling was required.

I greatly appreciate the support you have provided over the years, and as a result have recommended your firm to several clients and other engineering and geological consultants. If the need should arise, I would be happy to be a reference regarding your services.

Sincerely,

**GeoPentech**

John T. Waggoner  
Principal



## Interoffice Memorandum

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To Bechtel Project Managers File No.

Subject Ruen Drilling International, Inc. Date July 26, 2001

From Peter Yen

Of G&HES

Copies to At 50-2-C111 Ext 8-7438

To whom it may concern.

This is a letter of introduction concerning Ruen Drilling International, scheduled to visit Bechtel project sites in the New York area in the near future.

We have been working with Mr. Arlan Ruen, President, and Mr. Jon Carpenter, Manager of Business Development, and others at Ruen Drilling International, Inc., since 1996. They have conducted site investigations at numerous Bechtel projects as our drilling contractor. Notable projects performed for the Bechtel Geotechnical and Hydraulic Engineering Department included the Metropolitan Water District's Inland Feeder Project (including several campaigns of core drilling and groundwater monitoring), the Nevada Test Site projects and the Portland Light Rail Project. I am personally pleased with the responsiveness, energy and support of Ruen Drilling International's personnel. They have conducted their business in a professional and efficient manner, and have complied with our strict environmental and safety standards on past projects.

I can recommend them to Bechtel Project Managers to be considered as bidders for site investigation contracts. It is understood that this recommendation is made only with respect to Bechtel internal projects and should be evaluated in terms of the requirements of the drilling program, the technical requirements, and with the highest attention to safety in compliance with Bechtel guidelines.

A handwritten signature in cursive script, appearing to read "P. Yen".

Peter Yen  
Manager of Engineering Geology  
G&HES  
Bechtel Corporation  
San Francisco

August 21, 2001

Mr. Arlan Ruen  
Ruen Drilling, Inc.  
P.O. Box 267  
Clark Fork, Idaho 83811

Dear Arlan:

During our investigative drilling phase for the San Vicente to Second Aqueduct Project in San Diego, Ruen Drilling performed beyond our expectations. Your company was able to provide us with excellent geotechnical data.

We were most impressed with the abilities of the crews and supervisors, notably Jerry Marasovich, Jim Erdman, and lead driller Joe Siaperas. Work plans were well organized and followed during the execution of the work. Virtually no lost time resulted from logistical concerns and the project was completed under budget and on schedule. Coordination of moves, site preparation and site restoration were critical for our client on this job, due in part to the environmental concerns particularly the site at the Goodin Ranch.

You dedicated two of your senior people to this job, who explained procedures in detail and maintained excellent communication with our field people as well as the client representatives. Furthermore, they were able to effectively communicate with both technical and field oriented personnel. Extend our thanks to your crews and be assured we will consider your company strongly for upcoming geotechnical drilling and sampling.

Sincerely,

Bricley Associates LLC



Gregg Sherry

**URS Greiner Woodward Clyde***A Division of URS Corporation*

500 12th Street, Suite 200  
Oakland, CA 94607-4014  
Tel: 510.893.3500  
Fax: 510.874.3269  
*Offices Worldwide*

October 18, 1999

Mr. Arlan Ruen  
Ruen Drilling, Inc.  
P.O. Box 267  
Clark Fork, Idaho 83811-0267

**LETTER OF RECOMMENDATION  
RUEN DRILLING COMPANY**

Dear Mr. Ruen:

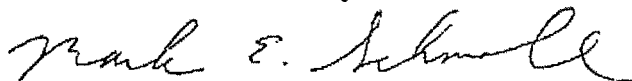
URS Greiner Woodward Clyde (URSGWC) is pleased to provide this letter of recommendation for Ruen Drilling, Inc. URSGWC (formerly Woodward-Clyde) have utilized Ruen Drilling on several projects over the last seven years requiring rock coring for design of dams, tunnels and pipelines. Two of the more significant projects that Ruen Drilling provided drilling services for include the Eastside Reservoir and Inland Feeder Tunnel projects for the Metropolitan Water District of Southern California. Each of these major projects required tens of thousands of feet of rock core drilling, packer testing, down hole surveys, and limited access drilling. Ruen Drilling recently provided rock core drilling for the Upper Diamond Forks project in Utah, which include a 5,500- and 10,000-foot long tunnel. This project required several deep angled core holes drilled with helicopter supported drilling rigs.

Ruen Drilling has consistently provided quality service at a cost competitive rate. Most importantly, Ruen Drilling has provided well trained, experienced crews and supervisors on every job completed for us. The drill crews show up on time and prepared with the proper equipment to complete the job. They also express a sincere interest in the job and communicate well with the field geologist to provide the information necessary to successfully complete the project.

Ruen Drilling has also provided the best equipment to meet the needs of the project. Several of the projects completed over the years have required limited access drills or helicopter transported skid rigs. Many of the drill sites were also in environmentally sensitive areas. Ruen Drilling crews have assisted URSGWC in complying with environmental restrictions during drilling and restoration of the drill site. They have also provided drilling support equipment in good working order whether it be packers, oriented core equipment, pumps or down hole survey cameras.

URSGWC is very pleased with the service Ruen Drilling has provide and would recommend them without hesitation.

Very truly yours,  
URS Greiner Woodward Clyde



Mark E. Schmoll  
Senior Engineering Geologist



Department of Water and Power



the City of Los Angeles

RICHARD J. RIORDAN  
Mayor

Commission  
RICK I. CARUSO, President  
KENNETH T. LOMBARD, Vice President  
JUDY M. MILLER  
DOMINICK W. RUSALCAYA  
MARCIA F. VOLPERT  
JOHN C. BURMAHLIN, Secretary

S. DAVID FREEMAN, General Manager

To: Ruen Drilling International Inc.  
P. O. Box 267  
Clark Fork, Idaho U.S.A. 83811  
ATTN: Mr. Arlan Ruen

October 14, 1999

From: Jeffrey A. Weldon  
Senior Project Geologist  
City of Los Angeles  
Department of Water & Power  
Geotechnical Engineering Business Unit

To Whom It May Concern:

Over the course of the last 3 years our firm has relied heavily upon the expertise of Mr. Arlan Ruen and his company, Ruen Drilling International. The projects, which we now have underway, involve expenditure into the tens of millions of dollars, projects that have been mandated under State Water Quality Law to be completed by specified dates. A drilling company capable of timely response staffed by a highly experienced team of drilling professionals was needed in order to complete the foundation research necessary to begin design and construction. Without the experience and exceptional quality of staff and equipment which makes up Ruen Drilling, many multimillion dollar projects which the Department had to have started, would never have gotten off the ground in the efficient fashion in which they did.

The fact that Ruen Drilling International is very responsive and concerned with the needs of their clients, and because they have the capabilities to meet any drilling challenge, I can give my personal recommendation on behalf of the City of Los Angeles, Department of Water and Power, to anyone or any agency in need of highly efficient and widely diversified drilling technologies.

It is our belief that through Ruen Drilling International, we have found the most cost effective, most capable, and all around most efficient drilling firm in the world today. Our future projects no matter how large or small will include Ruen Drilling International as a major part of our research and development efforts.

Sincerely;

Jeffrey A. Weldon  
Senior Project Geologist  
City of Los Angeles  
Department of Water & Power  
Geotechnical Engineering Business Unit  
(213) 367-4341

Water and Power Conservation... a way of life



**MEREDITH/BOLI & ASSOCIATES, INC.**

—SCIENTIFIC and REGULATORY CONSULTANTS—

6701 Center Drive West, Suite 500  
Los Angeles, California 90045-1535  
(213) 670-9221

7 February 1996

Mr. Arlan Ruen  
RUEN DRILLING, INC.  
P.O. Box 267  
Clark Fork, Idaho 83811-0267

Dear Arlan:

I wish to commend you and your company on the work you performed for Meredith/Boli & Associates (M/B&A) in regards to the Bank of America, Los Angeles Data Center project. In all instances, our drilling needs were met or exceeded by your drilling crews; your personnel obviously take great pride in their work. In addition, the efforts Ruen Drilling has taken to adjust drilling costs for this project were expressed to several Bank of America senior executives in a meeting conducted on 5 February 1996. The Bank was very pleased with your work and cost adjustments. For several years, M/B&A has attempted to identify a drilling company such as Ruen, that can effectively and efficiently handle our rotary drilling needs. I believe that Ruen Drilling will fill this role excellently.

It has been a pleasure working with Ruen Drilling. We will be in contact with you when we need your services in the future.

Sincerely,



James V. Bunker, R.G.  
Senior Geologist

JVB:cf

cc: Mike Meredith, Principal  
Stuart Michener, R.G., Senior Geologist  
Tom Davis, R.G., C.H.G., Senior Geologist  
MB-1994-192 File

**Woodward-Clyde**

Engineering &amp; sciences applied to the earth &amp; its environment

September 29, 1995

Mr. Arlan Ruen  
Ruen Drilling, Inc.  
P.O. Box 267  
Clark Fork, Idaho 83811-0267

Dear Arlan:

I was so pleased after the completion of the field exploration phase of our San Luis Rey River Crossing project that I want to express to you my thoughts.

The project is located in an area that required a special piece of equipment. The equipment you provided was ideal and the response time in mobilizing the equipment to meet our schedule is to be commended. But the important part of any drilling operation, as I am sure you will agree, is the personnel that operate the equipment. The driller and helper, Eric Moe and Kyle Eberle, did an outstanding job in every aspect of the project. The restrictions placed upon us to work at the boring locations in the river floodway required moving equipment and supplies by hand and leaving the site with minimal disturbance. The attitude and cooperation expressed daily by Eric and Kyle made what could have been a difficult job much easier, and it was a pleasure working with them. I feel they should be commended for their efforts and, consequently, am providing my expression of thanks to you for a job well done.

This is another instance of what has been a very satisfying 1 1/2 years working with your people on various jobs. Thanks again for the work ethic and I look forward to working with your firm on projects in the future.

Sincerely,

Daryl Streiff  
Senior Project Geologist  
Woodward-Clyde Consultants

REPLY TO  
ATTENTION OFDEPARTMENT OF THE ARMY  
SEATTLE DISTRICT, CORPS OF ENGINEERS  
P.O. BOX 3753  
SEATTLE, WASHINGTON 98124-2255Arlan Ruen  
Ruen Core Drilling, Inc.  
P.O. Box 267  
Clark Fork, ID 83811-0267

April 25, 1994

Dear Mr. Ruen:

I recently completed a drilling project at Howard Hanson Dam with Lyle Ballenger and John Feidt of your office, and I'd like to express my appreciation for a job well done. They came well prepared and the work proceeded smoothly from beginning to end.

The purpose of the exploration was to determine the most stable site for dam upgrades and good recovery was very important. Lyle achieved a recovery rate of approximately 98% in an area where previous drilling operations returned only 40%. Much of the material could easily have been washed away, and Lyle took great care to retain it while still staying ahead of schedule.

Howard Hanson Reservoir is the municipal water supply for the city of Tacoma and Lyle and John were very conscientious about keeping oil leaks under control with oil absorbent padding. Tacoma PUD personnel inspected the work site several times and were satisfied with the operation. The site was left in a good condition, both at the work break and at the end of the project.

Not only were Lyle and John professional, they were pleasant to work with. Lyle patiently explained drilling procedures. They moved core boxes around, kept my shelter in good condition, and were very helpful during packer tests. Both of them went out of their way to help me in any way they could, and my job was made a lot easier because of their efforts.

Sincerely,

Handwritten signature of Anna Campbell in cursive.

Anna Campbell, Geologist

Handwritten signature of David Gembala in cursive.

David Gembala  
Chief, Geology and Exploration

cc: Andrew Well Drilling Services, Inc.

## **COMPREHENSIVE ENVIRONMENTAL SERVICES**

### **EXPECT MORE...**

That's what Kleinfelder is about. We've built a solid reputation by providing our clients with high quality consulting services. Dedicated to providing clients with quality consulting services, Kleinfelder's staff of professionals, technicians, and administrative support personnel represents a wide range of disciplines in the fields of environmental, geotechnical, civil, mechanical, seismic, chemical engineering, construction management, materials and laboratory testing, special inspection, earth sciences, and information systems management. Kleinfelder is a \$140 million, employee-owned, consulting firm that is large enough to service major projects, yet strategically located to give personal attention to each project. With 1,500 employees in 68 offices, Kleinfelder is one of the largest employee-owned engineering firms in the nation.

**Diversity.** Kleinfelder employs a broad range of environmental professionals who can provide expertise in many technical areas including:

1. NEPA Compliance
1. Air Quality Services
1. Natural and Cultural Resources Management
1. Environmental Site Assessments
1. Hazardous Waste Site Investigations
1. Mold, Asbestos, and Lead-Based Paint Surveys
1. Solid Waste Management
1. Environmental Permitting and Compliance
1. Health Risk Assessments and Toxicology
1. Risk-Based Site Closure
1. Remedial Design and Construction
1. Water Resources Engineering

**Market Sector Experience.** Our list of satisfied clients includes:

1. Federal Agencies
1. State and Local Agencies
1. Transportation Agencies
1. Airports
1. Flood Control Districts
1. Developers/Redevelopment Agencies
1. Utilities
1. Oil and Gas Refining Operations
1. Manufacturing Companies
1. School Districts and Universities
1. Law Firms

## **ENVIRONMENTAL PLANNING SERVICES**

### **EXPERIENCED TEAM**

Kleinfelder has been involved in NEPA studies since 1986. Since that time Kleinfelder's projects have included surveys for threatened and endangered species, wetlands evaluations, land use evaluations, and environmental baseline studies. In addition, our project managers and technical staff bring years of experience with categorical exclusions (CATEXs), environmental assessments (EAs), findings of no significant impact (FONSIs), environmental impact

statements (EISs), supplemental EISs, and environmental documents mandated by legislation throughout the U.S.

### **BIOLOGICAL SERVICES AND NATURAL RESOURCE MANAGEMENT**

Kleinfelder specializes in providing assistance to both public and private clients who are required to meet regulatory requirements for threatened and endangered species conservation and effective habitat preservation. The group conducts baseline monitoring studies, wetlands studies, permit assistance and compliance, impact assessments, revegetation plans, and mitigation programs in terrestrial and coastal environments throughout the western United States.

Biologists are cognizant of the requirements of various environmental statutes including, but not limited to, NEPA, Endangered Species Act (ESA), and the Clean Water Act, and can help you with surveys of sensitive species and habitats and/or developing mitigation plans.

### **APPROACH TO NEPA**

Kleinfelder staff members have the expertise and experience to prepare a NEPA document that is concise but thorough; analytical but not encyclopedic. Our NEPA documents are prepared using the guidelines of the lead agency and adhere to the standards of commenting and coordinating agencies. In appropriate cases where both federal and state environmental impact documents are required, we identify how one document can combine these requirements and at the same time be cost effective and time sensitive.

A key feature of a successful permitting process is providing opportunities for early, significant, and meaningful public involvement. Typically, following the Notice of Intent (NOI), Kleinfelder initiates agency and public scoping for the proposed action. We work with your staff to determine how the scoping process should be handled. Our role can range from performing nearly all scoping activities to providing specialized support (i.e., presentation materials and other technical information). Establishing and maintaining an administrative record is a high priority for NEPA documentation. Kleinfelder provides assistance in establishing an organized system where full documentation and retrieval of information are available in the administrative record.

### **CULTURAL RESOURCES**

Protection of the nation's limited and sensitive resources is a concern to all of us. Kleinfelder's natural and cultural resource specialists adhere to a philosophy of providing high-quality evaluations aimed at integrating a client's development needs with protection of these valuable assets.

Our archaeologists and historians conduct studies that involve surveying, sampling, subsurface testing, monitoring, and mitigation for both historic and prehistoric resources and sites. This work is performed on a regional basis in support of local planning and redevelopment, as well as on a national basis for organizations like the Department of Defense in their efforts to manage resources on large military facilities.

Historical investigations include but are not limited to:

1. Resources Inventories and Surveys
1. Evaluation of Historic Properties
1. Historic Land Use Studies
1. Architectural Evaluations
1. National Register Assessment and Nomination
1. Historic Properties Management Plans

## **GEOGRAPHIC INFORMATION SYSTEMS SERVICES**

Geographic information system (GIS) software has become the standard for desktop mapping and management of spatially referenced data. GIS is an invaluable tool for compiling, analyzing, and visually presenting natural resources and geologic hazards data. Using GIS, maps of geographically referenced data representing an almost infinite variety of features (e.g., endangered species habitats, flood zones, maximum probable earthquake values, highways and roadways, geologic and hydrogeologic conditions, and meteorological data) can be quickly and accurately compared and analyzed. These data can be compared with geographic positioning system (GPS) data obtained from field analysis, and then used for making real-time decisions in the field. Once compiled, GIS data can be queried at a moment's notice to develop maps that can be used in making project decisions.

Kleinfelder offers GIS and GPS field survey services in the context of EIR/EIS studies, natural resources and hazards analyses, and other core services. Many of Kleinfelder's clients require GIS format project delivery to satisfy agency requirements.

## **PERMITTING AND COMPLIANCE SERVICES**

### **AIR QUALITY SERVICES**

A solution-oriented philosophy drives Kleinfelder's air quality consulting services. Most air quality problems are business problems that require environmental expertise to solve. Our approach involves combining scientific and engineering skills with a thorough understanding of regulatory and liability issues. As a result, we assist in all phases of air quality programs — from comment and expert testimony, to permitting and source emissions testing functions, through process and control technology modifications needed to cost-effectively reduce emissions and comply with regulations.

Kleinfelder has been providing air quality services for nearly 20 years for such clients as municipalities, regulatory agencies, military installations, and hundreds of industrial facilities including the semiconductor industry, oil and gas exploration and production, cement manufacturing, aggregate and asphalt production, wood and metal manufacturing, electric utilities, transportation, and hazardous waste treatment, storage, and disposal facilities.

Kleinfelder's air quality professionals are chemical engineers, atmospheric scientists, meteorologists, and other related specialists with an average of over 10 years of in-depth multi-disciplinary air quality experience. This expertise, coupled with years of successful turnkey project management, enables the firm to provide responsive, efficient services. Kleinfelder's air quality services include:

### **EMISSIONS TESTING/MONITORING**

1. Source Testing and Testing Protocols
1. Monitoring Program Design
1. Criteria Pollutants/Air Toxics Sampling
1. Certifications
1. Baseline/Ambient/Fenceline Monitoring
1. Meteorological Monitoring
1. Data Collection, Storage, and Management

## **AIR POLLUTION CONTROL SYSTEMS**

1. BACT/LAER Evaluation and Demonstration
1. Feasibility Studies
1. Equipment Specifications
1. System Design
1. Construction/Installation Management
1. Trouble Shooting/Performance
1. Evaluations

## **PERMITTING**

1. Title V Operating Permits
1. Emissions Inventories
1. Emissions Calculations/Prioritizations
1. Dispersion Modeling
1. Control System Strategies
1. Emission Reduction Credit Banking and Trading

## **REGULATORY SUPPORT**

1. Agency Liaison/Coordination
1. State Implementation Plan (SIP) Requirements
1. Mobile/Stationary Emissions Reduction
1. Compliance Audits
1. CEQA/NEPA Impact Assessments

## **AIR TOXICS**

1. Emissions Inventories and Emissions Estimating Techniques
1. Health and Risk Assessments
1. Control Systems/Emissions Reduction Plans
1. Accidental Air Releases
1. MACT/BACT Evaluations
1. Early Reduction Strategies

## **RISK ASSESSMENT/MANAGEMENT**

1. Exposure Assessments
1. Toxicity Assessments
1. Risk Characterization/Assessments
1. Risk Communication
1. Risk Mitigation and Reduction Plans
1. Risk Management and Prevention Plans (RMPPs)

## **PERMITTING AND COMPLIANCE**

The environmental market has changed dramatically from a regulations- and enforcement-driven market in the 1970s and 1980s, to a present-day market where companies want to integrate environmental management practices into their daily operations. Many Fortune 500 companies are seeking to integrate environmental management into their operations. These industry leaders have discovered the benefit of proactive environmental management as a means to enhance shareholder value and keep environmental compliance costs in check.

Kleinfelder's permitting and compliance services cover the full spectrum of federal, state, and local regulations focused on all types of environmental media. We conduct audits, prepare environmental documents and permit applications, and advise our clients on cost-effective strategies to manage environmental compliance. Whether we're addressing the challenges of legislation such as the Clean Air Act, RCRA, or Clean Water Act, Kleinfelder's environmental



scientists and engineers work closely with our clients to develop the most appropriate solutions in light of corporate goals and objectives.

## **SITE ASSESSMENT SERVICES**

### **PHASE I SITE ASSESSMENTS**

Kleinfelder completes hundreds of environmental site assessments (ESAs) each year to provide historical information about land use and evaluate existing environmental conditions. ESAs have been completed for a broad range of clients including land developers, major corporations, banks/lending institutions, utilities, and local government. The levels of development vary from vacant parcels to fully developed industrial, commercial, or residential sites and rights-of way.

Phase I ESAs are completed according to ASTM standards and include the following:

1. Review of historical aerial photographs and topographic maps.
1. Review of state and federal lists of known hazardous waste sites.
1. Documentation of chain-of-title and historical land uses of the subject property.
1. Physical inspection of the site, associated structures, and the surrounding or adjacent parcels/properties.
1. Survey of the facilities and building structures to evaluate the presence of lead-based and asbestos-containing materials, and urea formaldehyde/fiberglass insulation in building construction materials.
1. Discussions with appropriate regulatory agencies and review of appropriate regulatory records and documents.
1. Identification of underground pipelines, tanks, utility locations, and other substructures.
1. Geologic/hydrologic assessment.
1. Compilation/analysis/presentation of all data collected during the investigation.

Kleinfelder tailors ESAs, upon request, to meet client-specific requirements in addition to ASTM standards. The additional requirements have included collection of samples for laboratory analyses, review of wetlands information, geophysical surveys, and environmental document checklists.

### **ASBESTOS/LEAD-BASED PAINT SERVICES**

Kleinfelder provides asbestos and lead-based paint consulting from the initial building materials survey to abatement project oversight and final clearance air monitoring. The Asbestos Hazard and Emergency Response Act (AHERA) regulations in effect since 1987 created certain requirements with regard to conducting asbestos projects in public schools. Since the passage of the AHERA Reauthorization Act, ASHARA, in 1990, these requirements were extended to public buildings in addition to schools, private commercial buildings, and residential facilities.

Lead is another issue that must be considered with regard to worker health and safety. Generally, building owners should utilize asbestos/lead consultants prior to any renovation or demolition of their facility. Kleinfelder can provide the quality consultation and fieldwork to expedite the client's project and reduce the risks associated with projects of this nature.

### **ASBESTOS SERVICES**

Asbestos containing materials (ACMs) were widely used in building materials until the early 1980s. Current federal and state laws require that, in most cases, ACMs be removed prior to demolition or renovation of buildings. Kleinfelder provides asbestos consulting services to address asbestos hazards according to current regulatory requirements. Our services document the presence of ACMs through building material surveys; assist in the management of asbestos

through development of site-specific operations and maintenance plans; and facilitate the abatement of ACMs through preparation of abatement specifications, contractor abatement oversight, and clearance air monitoring. Our clients include financial institutions, hospitals, municipal governments, and property management companies.

### **LEAD-BASED PAINT SERVICES**

Lead-based paints (LBPs) were commonly used in building construction until the late 1970s. Regulations enforced by federal and state OSHA, the U.S. Department of Housing and Urban Development (HUD), EPA, and state agencies require that lead hazards be addressed.

Kleinfelder conducts lead surveys tailored to the needs and plans of the client. Our services document the presence of LBPs through building surveys; assist in the management of lead through development of site-specific operations and management programs; and facilitate the abatement of LBP by providing lead abatement specifications, abatement oversight, and air clearance monitoring and/or dust wipe sampling.

### **INDOOR AIR QUALITY AND SICK BUILDING SYNDROME**

Mold is an extremely common organism found in virtually every home and building. It is also at the center of what could become one of the fastest growing areas for environmental services for both construction defect and toxic tort litigation. Many complaints, classified as Sick Building Syndrome, and which may have involved mold contamination, are a consequence of the 1970s energy crisis. Prior to this, commercial buildings had windows that could be opened or closed, and private residences had generally good airflow, regardless of whether doors or windows were open. The 1973 oil embargo resulted in voluntary and involuntary energy conservation measures to curtail energy use through reduction of heat loss or gain. This sealed environment and lack of moisture evaporation created an environment for mold growth.

Kleinfelder provides turnkey services addressing IAQ issues such as on-site inspections and testing, data collection, evaluation, design of corrective measures, and verification testing. We provide our clients help with multiple sources of poor indoor air quality including, bioaerosols, biological contaminants, chemical contaminants and man-made mineral fibers. We assess buildings for moisture intrusion by looking at the building envelope and interior elements. Assessments of building envelopes involve inspection and analysis of the roof, air intakes, exterior elevations, foundations, crawl spaces, and basements. Interior assessments involve plumbing, ceilings, walls, floors and floor coverings, insulation, finishes and mechanical HVAC systems.

## **HEALTH RISK ASSESSMENT SERVICES**

### **SOUND DECISIONS**

Risk assessment and toxicology are essential elements for sound risk management decisions. The goals of such decisions include:

1. Limiting future liability in real estate transactions.
1. Incorporating environmental regulatory analysis in corporate business plans.
1. Selecting and designing cost-effective remedial actions at contaminated sites.
1. Protecting human health and the environment.

Kleinfelder avoids the use of generic, highly conservative methodologies which often raise more questions than they answer. A Kleinfelder risk assessment draws from many scientific disciplines to create a rational basis for managing the risks associated with a contaminated site, a chemical product, or an industrial process. Kleinfelder maintains a broad-based staff of

nationally recognized experts in human health and ecological risk assessment, toxicology, environmental chemistry, chemical fate and transport modeling, and statistics.

Our objective for each risk assessment is to integrate common sense, site-specific information, and the latest scientific data and methodologies. Our goal with each project is a rational and scientifically defensible basis for environmental decision making which results in protection of human health and the environment at a reasonable cost. Our strengths include:

1. Multidisciplinary capabilities in risk assessment including toxicology, ecology, air toxics, environmental chemistry, and chemical fate and transport modeling.
1. Substantial experience with risk assessment and site cleanup under federal and state regulations.
1. Proven track record of regulatory agency negotiation skills.
1. Ability to communicate risk assessment and health issues to the public.
1. Successful cost-effective risk-based cleanups at a variety of sites.

Risk assessment results rely heavily on the quality of the input data. Our exposure assessments incorporate up-to-date, regulatory agency approved exposure models appropriate for site-specific situations. Kleinfelder modelers can evaluate chemical dispersion in air, surface water, and groundwater, and the transfer of chemicals between media. Our knowledge and experience result in cost-effective, site-specific, accurate assessments.

Kleinfelder scientists use the results of risk assessments to develop risk-based cleanup objectives for specific sites. A risk-based approach is instrumental in remedy selection because the various remedial alternatives can be evaluated for the amount of benefit or risk reduction versus the magnitude of effort or cost. In evaluating each remedy, a risk-based evaluation can be sensitive to the influence of potential types of adverse effects, sources and pathways of exposure, specific environmental fate processes, locations of contamination, and types of chemicals. This approach can also be used for site cleanups due to ecological effects.

Site investigations and remediation frequently require both human health and ecological risk assessments. Ecological risk assessments have become more comprehensive with the development of formal U.S. EPA and state guidelines. Ecological assessments differ from human health risk assessments in that site-specific toxicological tests can be conducted to assess body burdens and food chain transfer of chemicals, or to measure direct toxic effects of chemicals in soil, water, or sediments. Kleinfelder scientists are experienced in assessing ecological effects based on literature data or using site-specific bioassays such as seed germination, root elongation, earthworm growth and mortality, and frog embryo development.

## **REMEDATION SERVICES**

### **REMEDATION SERVICES**

Environmental engineering solutions should be reliable and cost effective. Finding the right solution to address a contaminated site requires an up-to-date understanding of technology coupled with regulatory knowledge, the ability to be innovative, and the prudent know-how that only experience can bring. In addressing these needs, Kleinfelder takes pride in putting our problem-solvers to work, identifying solutions that are reliable as well as cost effective.

Kleinfelder performs regulatory reviews, product evaluations, industry standard reviews, design parameter analyses, and peer reviews to provide a sound basis for remediation design from

both a regulatory and technical basis. We used detailed drawings and specifications to define the remediation product and help minimize costly field changes and change orders. Project reviews throughout this design process help to maintain QA/QC.

In addition to the review process, we believe in consistent engineering staffing on projects from preliminary design to final design and construction. Kleinfelder's design approach includes:

1. Pre-design Review of Life-cycle Cost of Selected Alternatives
1. Preliminary Design Report
1. Preliminary Design Drawings and Construction Specifications
1. Construction and O&M Cost Estimates
1. Engineering Drawings and Specifications
1. Construction Oversight

Kleinfelder's engineers, scientists, and technicians have completed remedial designs, including plans, specifications, cost estimates, operation and maintenance (O&M) manuals, and design reports for a wide range of environmental projects.

#### **REMEDIAL INVESTIGATIONS/FEASIBILITY STUDIES**

Kleinfelder has both the capability and experience to undertake and implement comprehensive RI/FS programs designed to identify the best available and most cost-effective remediation options for a site and to facilitate preparation of a record of decision (ROD) or RCRA corrective action plan. We have applied both in situ and ex situ remediation technologies and have extensive experience with the range of options available for treatment of contaminated soils, groundwater, and surface water.

Our scientists use computer modeling to better understand site data and predict future contaminant migration under natural and remediation conditions. A list of some of the modeling software used routinely by Kleinfelder includes:

- |            |                       |
|------------|-----------------------|
| 1. CHEMFLO | 1. FLOWPATH           |
| 1. RITZ    | 1. SOILPROP           |
| 1. MODFLOW | 1. PROCESSING MODFLOW |
| 1. MT3D    | 1. ARMOS              |
| 1. MOTRANS | 1. VENTING            |
| 1. SESOIL  | 1. AT123D             |
| 1. MODPATH | 1. MODPATH-PLOT       |

Modeling results have been used to assist clients in predicting costs, performance, and monitoring requirements for environmental systems, which in turn, facilitates planning and reduces project costs.

Kleinfelder has designed, managed, and performed bench-scale and pilot-scale treatability studies. We have also designed, permitted, installed, operated, maintained, and monitored numerous field pilot tests. Tests have ranged from one-day procedures to extensive projects to investigate or prove a specific technology.

## **REMEDIAL DESIGN/IMPLEMENTATION**

Kleinfelder's primary goal when conducting remediation is to obtain approval for site closure in an expedient and cost-effective manner. We have designed and implemented numerous innovative remediation technologies, and have managed hundreds of soil and groundwater remediation projects.

*Technologies routinely evaluated for soil treatment include soil vapor extraction, in situ and ex situ soil washing; in situ stabilization, excavation and solidification/stabilization; bioventing; excavation, and ex situ biological degradation; thermal-assisted venting; excavation and low temperature desorption; excavation and incineration; capping; and slurry walls.*

Kleinfelder is a leader in the remedial design of contaminated groundwater. We have performed over 100 groundwater remediation and/or treatment designs at toxic sites. We provide a wide range of services, starting with hydrogeological studies and modeling, to determine groundwater flow and contaminant transport, to the design and construction of groundwater reclamation and treatment systems. Applicable technologies include enhanced bioremediation, air sparging and dual-phase extraction. Extraction designs have used vertical wells, trenches of various designs, horizontal wells, and physical barriers.

Treatment systems for extracted water employ physical, chemical, and biological treatment processes for the pretreatment, removal, and separation of halogenated solvents, pesticides, metals, inorganics, and petroleum hydrocarbons. Surface treatment systems have ranged from small skid-mounted air stripping and granular activated carbon (GAC) units for quick implementation of interim remedial measures to large systems of up to 500 gpm capacity. Kleinfelder has prepared natural attenuation petitions based on modeling, sampling, and monitoring for site closure. Kleinfelder brings specialized expertise in all feasible methods of groundwater remediation resulting in cost-effective and client-oriented approaches.

Kleinfelder personnel have provided construction management on many diverse remediation projects, including UST excavation and removal, large-scale excavations, installation of interim and full-scale groundwater remediation systems, and installation of both in situ and ex situ soil remediation systems.

## **OPERATION AND MAINTENANCE**

The primary focus of Kleinfelder O&M activities is to maintain the operational status of all installed equipment. Kleinfelder uses a proactive, preventative maintenance approach to strive for 90 percent up-time of all facilities. O&M activities have included preparation of O&M manuals and field logs; preparation of periodic reports and updates as required by the client and regulators; monitoring and recording of system parameters; and equipment and facility maintenance, including housekeeping routines. O&M activities are thoroughly documented in dedicated field logs throughout the life of the project.

## **SYSTEM OPTIMIZATION**

System optimization is a vital subset of O&M activities and is a critical step toward site remediation and closure. System optimization is a primary goal of Kleinfelder O&M activities. Kleinfelder personnel are experienced in the evaluation of system performance parameters and are dedicated to the implementation of optimized operations to facilitate site closure. Optimization techniques used by Kleinfelder personnel include maintenance of performance data graphs, trend analysis and tracking, identification of potential waste minimization and cost savings modifications, and implementation of performance investigations to determine optimum system operation. System optimization work is thoroughly recorded and documented throughout the life of the project.

## **MATERIALS TESTING AND INSPECTION SERVICES**

Kleinfelder offers materials testing and inspection services that can significantly reduce uncertainties during the construction process. Our engineers work closely with design professionals and other project team members throughout the project's duration, balancing the often-competing elements of time, budget, and quality.

Laboratory testing is provided by our own accredited laboratories, which are inspected and certified regularly by agencies that include:

International Conference of Building Officials (ICBO)  
American Society of Testing and Materials (ASTM)  
American Association of State Highway and Transportation Officials (AASHTO)  
State Departments of Transportation

We actively participate in the national reference sample testing proficiency programs provided by these agencies. This quality system assures our compliance with the requirements of ASTM and AASHTO testing standards.

Kleinfelder provides quality inspection and testing services during construction of numerous projects including commercial structures, public works projects, residential subdivisions, bridges, mines, roadways and airport runways.

We provide a full scope of services for the inspection and testing of construction-related materials. Our supervisory staff under the direction of a materials engineer reviews all testing and inspection services.

Site grading	Placement of reinforcing steel
Foundation excavations	Concrete placement
Backfill placement	Steel construction
Subgrade preparation	Masonry construction
Pile driving	High strength bolting
Drilled pier construction	Expansion bolting
Rock anchor placement	Drainage systems
Asphalt paving	Soil improvement
Concrete paving	Load tests
Reinforcement placement	Field instrumentation
Batch plant inspection	Underpinning

### **SPECIAL INSPECTION SERVICES**

Special inspection services are provided to verify the compliance of structural elements to project plans and specifications as set forth by the Uniform Building Code (UBC). These services can be provided by our approved technicians who have undergone voluntary certification by the ICBO. Their responsibilities on a project include the following, within the restraints and under the guidelines as set forth by the UBC:

Observing the work assigned for conformance with approved design drawings and specifications.

Furnishing inspection reports to the building official, construction manager, and other designated person(s).

Bringing all discrepancies to the immediate attention of the contractor, and if uncorrected, to the attention of the construction manager and building official.

Submitting a final signed report stating whether the work requiring special inspection was, to the best of our knowledge, in conformance with approved plans, specifications, and the workmanship provision of the UBC.

#### **FIELD SAMPLING AND TESTING SERVICES**

Kleinfelder performs sampling and testing services to assist client managers and on-site construction personnel, in maintaining awareness that:

Workmanship is being performed to a minimum of project specifications.

Construction materials provided for and utilized, meet minimum project specifications.

These services are intended to complement and assist the client's management team throughout construction-related activities.

Field sampling and testing services are performed by knowledgeable individuals familiar with local soil conditions and construction materials standards and attributes. Kleinfelder can provide technicians that have been certified by the following agencies:

International Conference of Building Officials (ICBO)

National Institute for the Certification of Engineering Technologies (NICET)

American Construction Inspectors Association (ACIA)

American Concrete Institute (ACI)

National Alliance for Quality Transportation Construction (NAQTC)

Field sampling and testing services are reviewed by our supervisory staff under the direction of our Materials Engineers.

#### **LABORATORY EVALUATION, DESIGN AND TESTING SERVICES**

Kleinfelder maintains modern and fully equipped laboratories for the evaluation, design and testing of most construction-related materials. Laboratory tests are performed by trained, experienced technicians, most of whom are certified through NICET, ICBO, ACI and NAQTC.

Kleinfelder's in-house quality assurance program maintains a high level of accuracy, consistency and reproducibility. Our field and laboratory testing equipment is calibrated regularly by certified independent agencies, traceable to the National Institute for Standards and Technology (NIST).

Evaluation of our regional sampling and testing procedures and testing equipment is also conducted by local building departments, the U.S. Navy, the U.S. Army Corps of Engineers, and State Departments of Transportation. These evaluations are provided to verify that our work is performed in accordance with the standards of the respective agencies.

#### **PETROGRAPHIC LABORATORY SERVICES**

Kleinfelder employs microscopic/petrographic evaluations to assess the quality of concrete, cement, aggregates, mortar, grout, plaster, stucco, terrazzo, soils and other building and

construction materials. We are able to diagnose the causes of deterioration/distress and to determine the extent of damage as well as help the client take cost-effective remedial actions. We provide assistance in the evaluation and rehabilitation of structures, such as buildings, foundations, dams, parking garages, roofs, facades, floors, and pavement for both public and private clients. Petrographic services will complement Kleinfelder's existing materials consulting services that include:

- Concrete durability enhancement
- Structural condition survey
- Applied research/development
- Construction troubleshooting (failure analysis)
- Construction dispute arbitration
- Expert testimony
- Nondestructive testing (impulse response)
- Product testing (epoxies, sealers, adhesives)
- Corrosion testing
- Moisture surveys
- Water and air filtration

Petrographic services will add additional materials research for aggregates, cements, clays, lime, pozzolans, and waste by-products.