

STATE OF NEW MEXICO  
WATER QUALITY CONTROL COMMISSION



**IN THE MATTER OF THE PETITION  
FOR ALTERNATIVE ABATEMENT STANDARDS  
FORMER PRICE'S VALLEY GOLD NORTH DAIRY,  
BERNALILLO, SANDOVAL COUNTY, NEW MEXICO**

**NO. WQCC 16-02 (A)**

**NEW MEXICO ENVIRONMENT DEPARTMENT'S  
STATEMENT OF INTENT TO PRESENT TECHNICAL TESTIMONY**

Pursuant to the Water Quality Control Commission ("Commission") Adjudicatory Procedures, 20.1.3 NMAC, the New Mexico Environment Department ("Department") submits this Statement of Intent to Present Technical Testimony at the public hearing in this matter, scheduled to be held on September 13, 2016. The hearing will address the Petition for Alternative Abatement Standards ("Petition") for the Former Price's Valley Gold North Dairy in Sandoval County, New Mexico. The Petition was filed by D & G Price Limited Partnership ("Petitioner") on April 28, 2016.

In accordance with 20.1.3.17.E NMAC, the Department states as follows:

1. Name of person filing the Statement of Intent

The Ground Water Quality Bureau of the Water Protection Division of the New Mexico Environment Department.

2. Statement of position

The Department does not oppose the Petition, and recommends that the Commission grant the Petition.

3. Name and affiliation of the Department's witness

Ali Furmall  
Manager, Remediation Oversight Section  
Ground Water Quality Bureau  
New Mexico Environment Department  
Santa Fe, New Mexico

The Department reserves the right to call additional witnesses in rebuttal.

4. Estimated Length of Testimony

Ms. Furrall's direct testimony is estimated to take approximately **30 minutes**.

5. List of exhibits to be offered at the hearing

The Ground Water Quality Bureau intends to offer the following exhibits into evidence at the hearing:

- NMED Exhibit 1: Written Testimony of Ali Furrall
- NMED Exhibit 2: Resume of Ali Furrall
- NMED Exhibit 3: Figure depicting thickness of the Valley Fill Aquifer
- NMED Exhibit 4: Letter from Office of the State Engineer re Well Restrictions

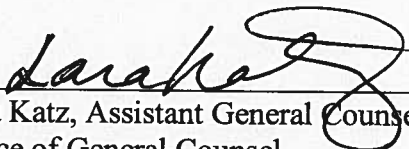
The Department may introduce additional exhibits as evidence for purpose of cross-examination or in rebuttal. The Department may also use additional demonstrative exhibits at the hearing, such as photographs, maps, charts, graphs, and power-point slides, without introducing them into evidence.

6. Summary of Testimony

The written direct testimony of the Department's witness, Ms. Ali Furrall, is submitted herewith as Exhibit 1. Ms. Furrall will testify regarding the applicable criteria for evaluation of petitions for alternate abatement standards, her review and evaluation of the Petition in this case, and how the Petitioner has met the requirements under the New Mexico Water Quality Act, NMSA 1978, §§ 74-6-1 through -17 (as amended through 2013), and the Water Quality Control Commission's Water Quality Regulations, 20.6.2 NMAC.

Respectfully submitted,

NEW MEXICO ENVIRONMENT DEPARTMENT



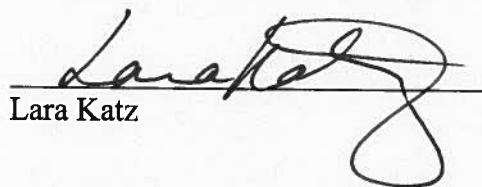
Lara Katz, Assistant General Counsel  
Office of General Counsel  
New Mexico Environment Department  
1190 St. Francis Drive  
Santa Fe, New Mexico 87505  
Telephone: (505) 827-2885

**CERTIFICATE OF SERVICE**

I hereby certify that a copy of the foregoing Statement of Intent to Present Technical Testimony was served on the following parties of record on September 2, 2016:

Ms. Pam Castaneda  
Water Quality Control Commission  
1190 St. Francis Dr.  
Santa Fe, New Mexico 87505  
pam.castaneda@state.nm.us  
*Administrator for the New Mexico  
Water Quality Control Commission*

Pete V. Dominici Jr.  
Domenici Law Firm, PC  
320 Gold Avenue SW, Suite 100  
Albuquerque, New Mexico 87102  
pdomenici@domicilaw.com  
*Attorney for Petitioner*



Lara Katz



**STATE OF NEW MEXICO  
WATER QUALITY CONTROL COMMISSION**

**IN THE MATTER OF THE PETITION  
FOR ALTERNATIVE ABATEMENT STANDARDS  
FORMER PRICE'S VALLEY GOLD NORTH DAIRY,  
BERNALILLO, SANDOVAL COUNTY, NEW MEXICO      NO. WQCC 16-02 (A)**

**WRITTEN TESTIMONY OF ALI FURMALL**

1            My name is Ali Furrnell, and I am the Manager of the Remediation Oversight Section  
2 with the New Mexico Environment Department ("Department" or "NMED") Ground Water  
3 Quality Bureau. I am presenting this testimony in the hearing concerning the Petition for  
4 Alternative Abatement Standards ("Petition") for the Valley Fill Aquifer ("VFA") at the former  
5 Price's Valley Gold North Dairy ("PVGND") in Sandoval County, New Mexico. D & G Price  
6 Limited Partnership ("Petitioner") filed its Petition on April 28, 2016.

7            **I.      QUALIFICATIONS**

8            I hold a Bachelor of Science degree in Geology from the University of South Florida, and  
9 a Master of Science degree in Geological Sciences from the University of Oregon. Since  
10 obtaining my M.S. degree, I have continued my education by attending trainings and  
11 professional conferences related to geology, as well as technical and regulatory topics on  
12 groundwater and site investigations, vapor intrusion, and remedial action technologies. I am also  
13 a contributing author to the Geospatial Analysis for Optimization at Environmental Sites web-  
14 based guidance document and training currently under development by the Interstate Technology  
15 Regulatory Council.

16           I have held my current position of Program Manager of the Ground Water Quality  
17 Bureau's Remediation Oversight Section since July 2016. In this capacity, I manage two

1 programs that oversee the investigation and remediation of sites with soil and groundwater  
2 contamination throughout New Mexico. The State Cleanup Program administers the portions of  
3 the Water Quality Control Commission regulations, 20.6.2 NMAC, that require corrective  
4 actions to mitigate any damage caused by an unauthorized discharge, and investigation and  
5 abatement of subsurface contamination in order to attain groundwater standards. I also manage  
6 the Voluntary Remediation Program, which oversees voluntary corrective actions under the  
7 authority of the Voluntary Remediation Regulations, 20.6.3 NMAC, with a focus on facilitating  
8 property transactions while ensuring that impacts to soil and groundwater are mitigated to meet  
9 standards and protect human health and the environment.

10 I have been employed with the Department since 2013, with three years in the Ground  
11 Water Quality Bureau. Prior to my service with the Department, I worked as a geologist  
12 conducting environmental investigations and corrective action at Los Alamos National  
13 Laboratory. I am a member of the Interstate Technology Regulatory Council, American  
14 Geophysical Union, and Geological Society of America.

15 A copy of my resume is marked as NMED Exhibit 2. It is accurate and current.

## 16 **II. GENERAL DESCRIPTION OF THE PVGND FACILITY**

17 The former PVGND property is located on the east side of New Mexico Highway 528 in  
18 Bernalillo, New Mexico. The northern portion of the original dairy has been closed and is  
19 occupied by Walmart and other commercial businesses. See Petition, Figure 1. The portion of  
20 the property subject to this Petition, depicted in the Petition at Figure 2, is comprised of 7.4 acres  
21 located north of Venada Arroyo and near the intersection of Spanish Bluff Street and Venada  
22 Plaza Drive, as shown on the Venada Plaza Plat, Section 36, Township 13N, Range 3E.

23

1 **III. DESCRIPTION OF VALLEY FILL AQUIFER**

2 The affected water body is the VFA, a localized wedge-shaped perched aquifer of limited  
3 extent. The portion of the VFA aquifer that is the subject of the Petition is bound on the south by  
4 the Venada Arroyo. On the north and west, it pinches out on the underlying confining clay, and  
5 to the east it is in communication with the Rio Grande valley fill.

6 The VFA consists of the combined Venada Arroyo Fill and the Rio Grande Valley Fill.  
7 The units are hydraulically connected on the east and exhibit an average water level elevation of  
8 about 5040 feet above sea level. The VFA is separated from the Upper Santa Fe (USF) aquifer  
9 by a red clay layer in the USF. The red clay aquitard results in a 20 foot water level difference  
10 between the VFA and USF aquifers.

11 **IV. HISTORY OF ABATEMENT ACTIVITIES AT THE SITE**

12 In connection with the closure of dairy operations on the Property, investigations and  
13 studies were performed which indicated that groundwater standards were exceeded and soil was  
14 contaminated on portions of the Property at the time of closure. In 2006, DP-437 was terminated  
15 and investigation and remediation of the site has since proceeded under the WQCC's abatement  
16 regulations, sections 20.6.2.4000 through 20.5.2.4116 NMAC. Environmental site conditions  
17 have been fully characterized and the Stage 1 Abatement Plan has been completed. The site is  
18 currently in Stage 2 Abatement and is in Long Term Monitoring. Two interim abatement actions  
19 approved by the Bureau have been performed at the site: in situ denitrification was performed in  
20 2008, and a groundwater extraction and discharge system was operated from October 2013 until  
21 July 2015. These abatement actions failed to achieve standards, and monitoring wells in the  
22 Valley Fill Aquifer continue to show groundwater is impacted by nitrogen, chloride and total  
23 dissolved solids ("TDS").

1 **V. PROPOSED ALTERNATIVE ABATEMENT STANDARDS**

2 Petitioner has proposed alternative abatement standards (“AAS”) for the property of 220  
3 mg/L for nitrate, 350 mg/L for chloride, and 3,310 mg/L for TDS. The AAS are requested in  
4 perpetuity to facilitate site closure and development, with institutional controls proposed to  
5 ensure that the VFA is not used as a potable water supply in the future.

6 **VI. STATUTORY AND REGULATORY REQUIREMENTS FOR AAS PETITIONS**

7 Alternative abatement standards fall within the Commission’s authority to grant a  
8 variance from any requirement of the water quality regulations, pursuant to Section 74-6-4(H) of  
9 the Water Quality Act. The Commission’s abatement regulations provide that a responsible  
10 person may submit a petition for approval of AAS any time after submission of a Stage 2  
11 abatement plan. The Department reviews petitions for AAS and makes a recommendation to the  
12 Commission regarding approval based on the following criteria:

13 (a) compliance with the abatement standard(s) is/are not feasible, by the  
14 maximum use of technology within the economic capability of the responsible  
15 person; OR there is no reasonable relationship between the economic and social  
16 costs and benefits (including attainment of the standards set forth in Section  
17 20.6.2.4103 NMAC) to be obtained;

18 (b) the proposed alternative abatement standard(s) is/are technically  
19 achievable and cost-benefit justifiable; and

20 (c) compliance with the proposed alternative abatement standards will not  
21 create a present or future hazard to public health or undue damage to property.  
22

23 20.6.2.4103.F(1) NMAC.

24  
25 An AAS petition must provide the information required under Subsection  
26 20.6.2.4103.F(2) of the abatement regulations, as well as that required for variance petitions  
27 under Subsection 20.6.2.1210.A NMAC. 20.6.2.1210.A NMAC requires that the petition:

28 (1) state the petitioner’s name and address;

29 (2) state the date of the petition;

30 (3) describe the facility or activity for which the variance is sought;



- 1 (4) state the address or description of the property upon which the facility is
- 2 located;
- 3 (5) describe the water body or watercourse affected by the discharge;
- 4 (6) identify the regulation of the commission from which the variance is sought;
- 5 (7) state in detail the extent to which the petitioner wishes to vary from the
- 6 regulation;
- 7 (8) state why the petitioner believes that compliance with the regulation will
- 8 impose an unreasonable burden upon his activity; and
- 9 (9) state the period of time for which the variance is desired.

10  
11 Subsection 20.6.2.4103.F(2) NMAC requires that an AAS petition also specify

12 the water contaminant(s) for which alternative standards(s) is/are proposed, the  
13 alternative standard(s) proposed, the three-dimensional body of water pollution  
14 for which approval is sought, and the extent to which the abatement standard(s)  
15 set forth in Section 20.6.2.4103 NMAC is/are now, and will in the future be,  
16 violated.

17  
18 **VII. THE PETITION MEETS THE REGULATORY REQUIREMENTS**

19 I have reviewed the PVGND Petition and, based on my review, I conclude that the  
20 Petition meets the statutory and regulatory requirements under the Water Quality Act and the  
21 Water Quality Control Commission regulations, as discussed below.

22 **A. Compliance with Abatement Standards is Not Feasible**

23 The Petitioner has demonstrated that compliance with the abatement standards in  
24 20.6.2.4103.B is not feasible, pursuant to 20.6.2.4103.F(1)(a) NMAC. As stated above, two  
25 interim abatement actions approved by the Bureau have been performed at the site: in situ  
26 denitrification in 2008, and groundwater extraction was performed from October 2013 until July  
27 2015.

28 Further use of in situ denitrification for cleanup of the impacted groundwater is not  
29 feasible, both on economic and technical grounds, for the following reasons:

- 30 • The line of injection wells requires that all groundwater pass through the treatment zone  
31 in order to be denitrified; however, we know from decades of well gauging that  
32 groundwater in the VFA reverses gradient typically from east to west and vice versa  
33 based on communication with water levels in river bed alluvium, and is therefore

1 somewhat stagnant with respect to ultimate discharge point. Thus, downgradient is a  
2 transient concept, groundwater flows to and fro, and reliance on groundwater passing  
3 through a treatment barrier in a downgradient sense will not result in cleanup in a timely  
4 manner;

- 5
- 6 • This technology does nothing to treat chloride and TDS, so even if nitrate concentrations  
7 were reduced, AAS for chloride and TDS would still be required in order to terminate  
8 abatement and close the site;
- 9
- 10 • The addition of sodium acetate and sucrose will cause the groundwater to become  
11 reducing, or anaerobic, in nature. This has the potential to cause dissolution of metals  
12 subject to oxidation and reduction reactions: arsenic, iron, and manganese. Robust  
13 application of this technology may reduce nitrate, but result in dissolved metals  
14 concentrations in excess of standards and the site would continue in abatement  
15 indefinitely.
- 16

17 The technology available for significant chloride and TDS reduction is groundwater  
18 extraction. Groundwater extraction via pumping and discharge was recently completed as part of  
19 the Stage 2 abatement plan, and the effect was not permanent. Contaminant concentrations  
20 rebounded as soon as the VFA reverted to natural gradients.

21 Neither chloride nor TDS will significantly reduce over time via natural attenuation  
22 processes in the stagnant VFA groundwater. In fact, inducing reducing conditions via acetate and  
23 sucrose injection will exacerbate the inorganic constituent concentrations. Ex situ treatment of  
24 pumped groundwater via reverse osmosis is cost prohibitive, and technically infeasible due to  
25 lack of disposal options for the resultant concentrated wastewater.

26 In sum, several decades of natural attenuation and two engineered cleanup actions  
27 described above (in situ denitrification and groundwater pumping and discharge) have not  
28 reduced contaminant concentrations in groundwater in the VFA to the 20.6.2.3103 NMAC  
29 standards. After cessation of groundwater pumping, concentrations have reverted to pre-  
30 abatement levels in select wells in areas where the VFA thins and is difficult to hydraulically  
31 stress (due to low transmissivity related to minimal aquifer thickness). The VFA is stagnant and

1 perched, and the lack of both groundwater flow-through with attendant dispersion and intrinsic  
2 denitrification renders it very difficult to reduce concentrations.

3 **B. There is No Reasonable Relationship Between the Economic and Social Costs**  
4 **and Benefits**

5  
6 Petitioner has also demonstrated that there is no reasonable relationship between the costs  
7 and benefits of continuing abatement and the social costs and benefits of doing so. *See*  
8 20.6.2.4103.F(1)(a) NMAC. Because of the nature of the Valley Fill Aquifer, as discussed  
9 previously, it is likely that no abatement effort at any cost will achieve Section 3103 standards.

10 Petitioner has proposed the following institutional and government controls to prevent  
11 future use of the Valley Fill Aquifer as a source of potable water in order to mitigate social costs  
12 from the proposed AAS:

13 1. Petitioner will record a deed restriction in the Sandoval County real property  
14 records prohibiting construction of wells in the Valley Fill Aquifer. The deed notice will provide  
15 owners, operators, prospective buyers, and others with notice and information regarding the  
16 groundwater condition in the Valley Fill Aquifer. The deep regional Upper Santa Fe Group  
17 Aquifer can still be used for water supply on the Property. A copy of the deed notice is included  
18 as Appendix H to the Petition.

19 2. The Department will petition the New Mexico State Engineer under State  
20 Engineer regulation 19.27.5.13.A NMAC to issue an Order prohibiting construction of a well in  
21 the affected water-bearing zone of the Valley Fill Aquifer, Lot 5-B and contiguous portions of  
22 Venada Plaza Drive. Appendix H of the Petition includes the necessary information and  
23 documentation for the Department to prepare its recommendation for the Order under  
24 19.27.5.13.A if the Commission approves the Petition. This information has been reviewed by  
25 the Office of the State Engineer (“OSE”), and the OSE has confirmed that the information, as

1 well as the public notice in this proceeding which included notice of the proposed OSE well  
2 restrictions, are sufficient for the OSE to issue the Order upon the Commission's approval of the  
3 Petition. The Department is awaiting a letter from the OSE stating this confirmation in writing,  
4 which letter the Department expects to submit into evidence as NMED Exhibit 4 either before or  
5 during the September 13, 2016 hearing.

6 Additionally, the following ordinances and rules further ensure that water from the  
7 Valley Fill Aquifer will not be used as source of potable water:

8 1. The Town of Bernalillo Water Use and Water Rate Ordinance, Ordinance 81,  
9 Article 4, Section 11 provides: "At such time as a public water main becomes available within  
10 two hundred (200) feet of a property line served by a private water well, a direct connection shall  
11 be made to the public water system in compliance with this Ordinance, within 90 days." Water  
12 and sewer lines have been installed along existing streets in the Venada Plaza Development. *See*  
13 *Petition, Appx. G.* Thus, under the above ordinance, city water supply will be provided to all  
14 buildings on the Property.

15 2. The New Mexico State Engineer's regulations at 19.27.4 NMAC contain  
16 provisions that prevent construction of a water supply in contaminated groundwater. *See*  
17 19.27.4.29 NMAC (requiring wells to be constructed to prevent contamination, inter-aquifer  
18 exchange of water, flood water contamination of aquifer, and infiltration of surface water);  
19 19.27.4.29.D NMAC (requiring that all wells be set back from potential sources of  
20 contamination in accordance with NMED regulations and other applicable ordinances and  
21 regulations); 19.27.4.30.A NMAC (requiring annular seals when necessary to prevent flow of  
22 contaminated or low quality water); 19.27.4.30.A(4) NMAC (requiring annulus sealing and  
23 proper screening in wells which encounter non-potable, contaminated, or polluted water at any

1 depth to prevent commingling of such water with any potable or uncontaminated water).

2 Because of the nature of the VFA, it is apparent that no effort and no reasonable cost are  
3 likely to achieve to the standards at Section 3103 of 20.6.2 NMAC. Therefore, an arrangement  
4 whereby the administrative controls are fully in place and fully documented, attached to the title  
5 to the property so that use of and exposure to VFA is prevented, is both protective of human  
6 health and beneficial to intended future land use. The AAS will allow the NMED to  
7 administratively close out abatement for this area, making the property available for  
8 redevelopment to an economically beneficial use. This would be a positive social impact as well.  
9 Conversely, failure to approve the AAS will result in the property remaining in a state of partial  
10 development as groundwater monitoring continues indefinitely.

11 **C. The Proposed AAS are Technically Achievable and Cost-Benefit Justifiable**

12 The proposed AAS have already been achieved as demonstrated over the past eight  
13 quarters of groundwater sampling results. The Petitioner will submit an Abatement Completion  
14 Report upon granting of AAS. The cost for this activity is nominal relative to the money spent on  
15 the two abatement activities. The ability to complete development of this parcel, which presently  
16 lies vacant in a partial state of development, is beneficial to the Town of Bernalillo. I have  
17 reviewed the Petitioner's cost-benefit analysis at pages 18-19 and find that it adequately  
18 demonstrates that the proposed AAS are cost-benefit justifiable, as required by  
19 20.6.2.4103.F(1)(b).

20 **D. Compliance with the Proposed AAS Will Not Create a Present or Future**  
21 **Hazard to Public Health or Undue Damage to Property**  
22

23 In accordance with 20.6.2.4103.F(1)(c), Petitioner has demonstrated that compliance with  
24 the proposed AAS will not create a present or future hazard to public health or undue damage to  
25 property. Exposure to nitrate impacted groundwater will be prevented by the institutional

1 controls outlined in Section VII.B. Such controls will eliminate the potential human exposure  
2 pathways and render the proposed AAS protective of public health. Chloride and TDS are listed  
3 in 20.6.2.3103.B, Other Standards for Domestic Water Supply, and thus are not considered  
4 human health concerns. Additionally, rather than causing damage to the property, closure of the  
5 abatement process will allow development of the property to be completed which will enhance  
6 the property and provide an economic and social benefit to the community.


7 **VIII. COMPLIANCE WITH 20.6.2.1210.A NMAC AND 20.6.2.4103.F(2)**

8 Based on my review, the Petition sufficiently sets forth the required information  
9 20.6.2.1210.A for variance petitions. *See* Petition at pp. 5-6. The Petition further contains the  
10 required information under 20.6.2.4103.F(2) NMAC for AAS petitions as follows:

- 11 • The contaminants for which AAS are proposed are nitrate, chloride, and TDS.
- 12 • The three-dimensional body of water pollution for which approval is sought is  
13 defined as the Valley Fill Aquifer. The water body is wholly contained horizontally  
14 within the boundaries of Lot 5-B. The water body extends vertically to the contact  
15 with the red clay aquitard stratigraphically above the Upper Santa Fe Group aquifer  
16 and is bounded on the east by the Rio Grande valley fill. A figure depicting the  
17 thickness of the Valley Fill Aquifer NMED Exhibit 3.
- 18 • The standards of 20.6.2.4103 NMAC incorporate the standards in 20.6.2.3103  
19 NMAC. Thus, the 20.6.2.4103 NMAC standards will be violated as follows:
  - 20 ○ The nitrate standard of 10.0 mg/l will be increased to 220 mg/l
  - 21 ○ The chloride standard of 250.0 mg/l will be increased to 350 mg/l
  - 22 ○ The TDS standard of 1000.0 mg/l will be increased to 3,310 mg/l


23 This concludes my testimony.

24 I, Ali Furmall, swear under penalty of perjury that the foregoing is true and correct.

25   
\_\_\_\_\_  
Ali Furmall  
Ground Water Quality Bureau

ACKNOWLEDGEMENT

Subscribed and sworn to before me this 2nd day of September, 2016 by Ali Furmall.

  
\_\_\_\_\_  
Notary Public

My commission expires:

2/26/2020







## Ali V. Furmall

Remediation Oversight Section Manager

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### Education

University of Oregon, Eugene, OR  
*Master of Science, Geological Sciences*

March 2010

University of South Florida, Tampa, FL  
*Bachelor of Science, Geology*

August 2007

### Relevant Experience

New Mexico Environment Department, Santa Fe, NM  
*Program Manager*

2013 – present

- Supervise personnel and program operation for the Voluntary Remediation and State Cleanup Programs.
- Assist staff with review of technical documents related sites with complex environmental issues.
- Assist with the management of multiple federal grants and develop proposals for new grant applications.
- Manage several professional services contracts.
- Participate in rule making and development of guidance to improve bureau and department ability to address sites with groundwater, soil, and air contamination.

### Geoscientist

- Oversee assessment and remediation of contamination in soil, ground water, and other media at sites enrolled in the Voluntary Remediation Program or receiving Targeted Brownfield Assessments.
- Provide brownfields redevelopment technical assistance to communities and developers.
- Promote the program through public outreach, public speaking, and workshops.
- Provide support to Brownfields Cleanup Revolving Loan Fund borrowers.
- Research technical and regulatory guidance documents to make recommendations on policy issues.
- Review work plans, activities, and reports to ensure compliance with state and federal environmental requirements and grant conditions.
- Maintain a detailed Voluntary Remediation and Brownfields site inventory.
- Assist local and tribal governments in evaluating properties with potential environmental concerns.

Los Alamos Technical Associates, Los Alamos, NM  
*Geologist*

2010 – 2013

- Implement all stages of environmental site characterization activities at Los Alamos National Laboratory (LANL).
  - Evaluate historic records and data to assess threats to human health and to the environment.
  - Develop and execute plans for investigative field work.
  - Work with LANL personnel to ensure Quality Control and Health and Safety requirements are met.
  - Prepare technical reports and risk assessments for LANL to deliver to NMED.
  - Perform investigations for the purpose of identifying, abating, or eliminating sources of pollutants or hazards that might affect either the environment or the health of the population.
- Use geologic information to identify sub-surface features that may impact contaminant transport.
- Supervise environmental drilling operations.
  - Collect soil, water, and pore gas samples for analysis.
  - Install monitoring wells according to project specifications.
  - Work with Waste Coordinators to ensure all removed media is managed in accordance with federal and state regulations.
- Prepare summary reports and charts of field activities, well logs, and detailed maps of survey areas.
- Contribute to environmental studies and reports as required by NEPA, including SWEIS and EA.

University of Oregon, Eugene, OR

2007 - 2010

*Graduate Researcher*

As a graduate student researcher, I focused on using geophysical methods to investigate subsurface characteristics where inaccessible to direct observation. My results are presented in my Master's thesis, "Melt Production and Ridge Geometry Over the Past 10 Myr on the Southern Kolbeinsey Ridge."

University of Oregon, Eugene, OR

2007 - 2009

*Graduate Teaching Fellow*

- Assist students in mastering geologic field techniques.
- Lead lab sections of undergraduate level Geology classes.
- Meet individually with students outside of classroom.

**Related Skills and Certifications**

HAZWOPER 40-hour certification

HAZWOPER 8-hour Supervisor certification

OSHA 10-hour Construction Worker

Certified Inspector of Sediment and Erosion Control (CISEC # 1176)

CPR/First Aid certification

Experience using: ESRI ArcGIS, RockWorks, LogPlot, and GMT mapping software.

Experience with geologic mapping techniques.

**Relevant Coursework**

- Sedimentology / Stratigraphy
- Structural Geology
- Volcanology
- Hydrogeology
- Seismology
- Geomorphology
- Coastal Processes
- Tectonics
- Mineralogy / Petrology
- Field studies in: geologic mapping, hydrology, geophysical techniques, and coastal processes

**References available on request.**



**LEGEND:**

- EW-1    EXTRACTION WELLS
- MW-23    VALLEY FILL AQUIFER MONITORING WELL
- MW-11R    UPPER SANTA FE AQUIFER MONITORING WELL
- BOUNDARY OF AFFECTED GROUNDWATER
- VALLEY FILL AQUIFER THICKNESS MAJOR CONTOUR
- VALLEY FILL AQUIFER THICKNESS MINOR CONTOUR

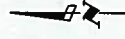


IMAGE SOURCE: GOOGLE 01/17/2013

FORMER PRICE'S VALLEY GOLD DAIRY  
BERNALILLO, SANDOVAL COUNTY

**VALLEY FILL AQUIFER  
THICKNESS**

PROJECT #:	150801	PROJECT PHASE:	04	PROJECT MANAGER:	JS
130 Old America Street, Suite 1110 Albuquerque, NM 87102 Phone: (505) 224-8610 Fax: (505) 224-8619					

