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9	SUPEROR COURT FOR THE STATE OF CALIFORNIA					
10	COUNTY OF RIVERSI	DE – CENTRAL DISTRICT				
11	MOJAVE BASIN AREA WATER CASES	JCCP NO.: 5265				
12		Lead Case No. CIV 208568				
13	CITY OF BARSTOW, et al.	Assigned for All Purposes to the				
14	Plaintiffs,	Honorable Harold W. Hopp, Dept. 1				
15	VS.	Honorable Craig G. Reimer, Judge Presiding by assignment of the Chief				
16	CITY OF ADELANTO, et al.	Justice				
17		Amended RESPONSE BY NEWBERRY				
18	Defendants,	SPRINGS RECREATIONAL LAKES ASSOCIATION TO GOLDEN STATE				
19	AND RELATED CROSS-ACTIONS.	WATER COMPANY'S MOTION TO ENFORCE JUDGMENT; DECLARATION				
20		OF DR. W. RICHARD LATON, PG, CHG,				
21		SUPPORTING THE RESPONSE				
22		Hearing Information: Date: October 22, 2024				
23		Time: 1:30 pm				
24		Dept: M302 – Menifee Justice Center				
25						
26	NEWBERRY SPRINGS RECREATION	ONAL LAKE ASSOCIATION, hereinafter referre				
27	to solely as "NEWBERRY", responds and sup	ports the motion of Golden State Water Company				
28	AMENDED RESPONSE BY NEWBERRY SPRINGS					

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in its effort to enforce the judgment and NEWBERRY argues in support of the motion, providing additional expert opinion as to its necessity, as follows:

### PRELIMINARY STATEMENT

It should be noted that NEWBERRY does not oppose this motion, in fact, it had desired (since 2021) to make such a motion itself, but only would have done so in collaboration with larger stakeholders such as Golden State Water Company, which serves over 40,000 customers. Now that the motion has been filed by Golden State Water Company, NEWBERRY submits the amended declaration of its expert, Dr. W. Richard Laton, for purposes of this hearing and consideration by the Court, and will make Dr. Laton available for questions from and explanations to the Court with respect to his written declaration, in accordance with the Court's orders regarding revised documents and declarations issued at the October 2, 2024 hearing.

The intent in producing the supporting information of Dr. Laton, is to further demonstrate that the motion made by Golden State Water Company is essential to ongoing Basin management, and well taken as to the relief requested.

NEWBERRY further underscores that the relief requested is simply a request that the Court order further investigation and review of the science, forthwith, based upon the evidence provided by all experts. For decades, the same science and same assumptions have been relied upon to assess the success of the plan for the Mojave Basin Area adjudication. It is axiomatic that both technology and progress in science has improved the collection of data to test if the assumptions previously made are valid or require amendment or adjustment. The impact on the constituency (users), which the adjudication is meant to serve and protect, is the focus of this adjudication, not whether or not some expert is "more right" or should be more relied upon, than AMENDED RESPONSE BY NEWBERRY SPRINGS RECREATIONAL LAKES ASSOC. TO GSWC'S MOTION TO ENFORCE JUDGMENT, ETC. PAGE 2

another. Newberry argues that the Water Master Engineer, rather than object to new methods, testing, and collection of data that tests prior assumptions, would welcome the opportunity to better serve, and more reliably serve the water users of the Mojave Basin Area.

NEWBERRY and its various members, themselves, are vigilant as to their specific rights and obligations under the Judgment. It has participated in all aspects with the Watermaster, has kept itself informed and offered input and suggestion, even if only from its lay perspective. But as a water user, among other users, it is sometimes more valuable to juxtapose common sense and actual experience against the science, in order to challenge and find any shortcomings in the scientific analysis and improve the outcomes for all users in the Basin.

### NEWBERRY'S POSITION IN SUPPORT OF GOLDEN STATE WATER COMPANY

NEWBERRY understands that the Judgment After Trial was a compromise that was supposed to remedy a problem. At the time of the original Judgment, NEWBERRY further understood that the "Transition Zone" was established as the place for Alto to meet its downstream obligation to Centro according to the Judgment. The assumption was that the water flowing into the Transition Zone would continue downstream to the basins of Centro and Baja, by keeping the groundwater table high. The conceptual metaphor of "keeping the cup full" is a simple idea. If the cup is full, then when one adds an ounce of water to the cup, then an ounce of water would also spill over to the next cup. (See Illustration from – Exhibit 3 to the Anmended Declaration of Dr. Laton."

The Cup Full concept is also referred to as the "Water Bridge". The Transition Zone has a descending elevation difference from south (higher elevations) to north (lower elevations). When water is added on the south side it should spill over the Helendale fault at the north end. This is the issue we believe that the Golden State motion addresses; it is necessary to confirm the AMENDED RESPONSE BY NEWBERRY SPRINGS RECREATIONAL LAKES ASSOC. TO GSWC'S MOTION TO ENFORCE JUDGMENT, ETC.

PAGE 3

 spillover. The Watermaster appears not to have the best scientific data available when it makes its annual recommendation. Based upon the ongoing decline in water levels in the wells of the Golden State Water Company (despite all reduction in pumping), the projected "spill" into Centro appears not to have happened.

NEWBERRY has always maintained the position that amount of reported water from the Alto Subarea to the Transition Zone and then to Centro has not been accurately measured. It has also participated in numerous meetings to bring this position to the Watermaster and its Engineer. However, as a lesser stakeholder, at the bottom of the Water Bridge, or the "last cup", so to speak, its presentations and arguments have been politely regarded with no action taken. NEWBERRY believes that the "economy of scale", that of spending dollars to benefit the greatest number of water users, has been the constraining factor as to its solo efforts, both from a cost and benefit analysis.

NEWBERRY contends that the obligation to supply water to the Transition Zone was clearly a vehicle or means to resolve Barstow's complaint/needs set forth in the underlying action. If it were otherwise, the actual settlement would have been worthless for the downstream areas and a windfall for the upper basins.

As we now have three decades of information, it appears to be the time to accurately report, update and explain just what is happening, . Numerous factors contribute to the need to ascertain if the water bridge is working as intended. Issues to be addressed, from NEWBERRY'S perspective include:

1. The science used was flawed, therefore the settlement is flawed and should be amended.

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- The water level in the Transition Zone has increased but it is unknown if the projected amount of water is flowing to the Centro Subbasin.
  - 3. The settlement is being interpreted wrongly by MWA/Watermaster.
  - 4. River forces have changed since the settlement.

Possible changes/forces to the Mojave River since the Judgment are:

- Mojave Water Agency R3 project now pumps from the River to send water to customers for a profit.
- 2. Flood control on the River and tributaries that slow storm flow and allow for more water attenuation in the upper basin as was set forth and learned in the "Briefing on the Cedar Springs and Forks Dam", by Matthew Howard of the Mojave Water Agency Cedar Springs Dam was built in 1971: Forks Dam was built in 1974.
  - 3. Slow release of water from the Cedar Springs Dam
  - 4. Overgrown channel through the Transition Zone
  - 5. Climate Change

### CONCLUSION

NEWBERRY contends that these multiple factors support the need to challenge the existing scientific methodology to ascertain if it is still the best science available. As set forth in the motion by Golden State Water Company and the declaration of Dr. Laton filed concurrently herewith, the issue is ripe and the requested relief, if ordered, would benefit all parties.

Dated: October 8, 2024

Diana J. Carloni

DIANA J. CARLONI, ATTORNEY FOR NEWBERRY SPRINGS RECREATIONAL LAKES ASSOCIATION

AMENDED RESPONSE BY NEWBERRY SPRINGS RECREATIONAL LAKES ASSOC. TO GSWC'S MOTION TO ENFORCE JUDGMENT, ETC. PAGE 5



I, W. Richard Laton, declare as follows:

- 1. I am the Principal Hydrogeologist and President/Owner of Earth Forensics, Inc. I am an expert in the field of geology, hydrology, hydrogeology, environmental contamination, and contaminated site investigations. I possess extensive knowledge and experience in the areas of hydrogeology, soil and water contamination, water quality, corrective action, hydrology and surface water, site assessment, site investigation, site remediation, wetlands, coastal monitoring/geomorphology, environmental field sampling techniques, and well hydraulics, waste management, as well as environmental remote sensing, aerial photographic interpretation/analysis and geographical information system (GIS). See Appendix A: CV.
- My educational background that relates to this case is as follows: 1997 Ph.D. in Hydrogeology, Western Michigan University; 1992 - M.S. in Environmental Earth Science, Western Michigan University; 1989 - B.A. in Earth Science, St. Cloud State University, Minnesota.
- 3. I am a licensed Professional Geologist in California, Alaska, Arizona, Illinois, Indiana, Florida, Minnesota, New York, North Carolina, Oregon, Pennsylvania, Texas and Washington. I am also a licensed Professional Hydrogeologist in both California and Washington. I am a Certified Professional Geologist with the American Institute of Professional Geologists and a Certified Professional Geologist for the European Union.
- 4. I am a Professor of Hydrogeology in the Department of Geological Sciences at California State University, Fullerton, California. This career continuation includes years of teaching, consulting, litigation support, and management experience. My course topics encompass hydrogeology, water quality, environmental sampling, groundwater modeling, well hydraulics, remediation technologies, RCRA/CERCLA compliance, meteorology, oceanography, geology, drilling and well construction, field hydrogeology, borehole, and surface geophysics.
- 5. I have worked as a consultant and researcher within the Mojave River/Desert area. This includes research conducted for and on behalf of the Mojave Water Agency in developing conceptual basin models and geological and hydrogeological mapping. My work was under specific assignments and

projects, resulting in reports, most of which were grant-funded and related solely to the specific purpose of the study. Additional work was performed by the Agency to determine the groundwater flow between basins and what, if any, changes had taken place at the time of the studies. This overall research resulted in no less than 16 public reports, 18+ presentations, and 12+ theses. Consulting efforts have included the evaluation of blowing sand, mountain-front recharge, and surface flow, as well as specific site evaluations for water resource supply.

6. I have been asked and retained by Newberry Springs Recreational Lake Association (NSRLA) for the purpose of providing opinions (recommendations) on the following issues affecting the Alto Transition Zone, Centro, and Baja sub-area.

The Mojave Judgment after Trial (Judgment) (Judgement, 1996) states the Mojave Water Agency (MWA) and Watermaster (Watermaster) shall manage the Mojave Basin Area (MWA/Watermaster). The stated missions of the MWA/Watermaster are represented below (taken from Agency website):

### Mojave Watermaster Mission

"MWA was appointed as Watermaster in 1993 pursuant to the Court Judgment which adjudicated the rights to pump groundwater in the Mojave Basin Area. Watermaster's main responsibilities are to monitor and verify water production for approximately 450 parties (1,700 wells), collect required assessments, conduct studies and prepare an annual report of its findings and activities to the Court." (https://www.mojavewater.org/basin-management/watermaster/)

### Mojave Water Agency Mission

"To manage the region's water resources for the common benefit to assure stability in the sustained use by the citizens we serve" (MWA 2020-21 Annual Budget)

MWA/Watermaster is responsible for managing the areas shown in **Exhibit 1**: Map showing Alto, Alto Transition Zone (TZ), Centro, and Baja Sub-areas. **Exhibit 1** also has the location of Mojave River USGS stream gages (active and inactive) and the major faults within the MWA/Watermaster service area.

obligation water entering the sub-areas is estimated annually by the MWA/Watermaster as baseflow + VVWRP discharge + subsurface (groundwater) flow, and the addition of any makeup obligation purchases (Watermaster Annual Report 2023, Figure 3-10). This assumes that maintaining a constant water level within the Alto TZ equates to flow into and out of the Alto TZ, which must equal flow into the Centro sub-area.

Specifically, the Watermaster Annual Report 2023 Page 26 state the following:

"The elements for calculating outflow from the Transition Zone to the Centro Subarea include:

- Long-term subsurface outflow (Table 5-1)
- Surface water outflow leaving the Transition Zone (which becomes inflow to the Centro Subarea)

Surface water outflow from the Transition Zone to the Centro Subarea is calculated based on the assumption that change in storage in the Transition Zone is zero. Historical water levels in the Transition Zone are stable over long periods of time (Figure 3-13). Therefore, for simplicity, surface water outflow is determined as the sum of water supply, less the sum of consumptive use and subsurface flow. Figure 3-10 shows that since the end of the hydrologic Base Period (1931-1990), average flow to Centro (1991-2020) has exceeded the Base Period average."

MWA/Watermaster has described in their annual reports and graphics that they are obligated to measure the flow to the Centro sub-area, not the Alto TZ (Judgment, Page G-2). As shown in **Exhibit 2**, the MWA/Watermaster describes the "Average Annual Subarea Obligation to Centro" as 23,000 AFY (Watermaster Annual Report 2023, Figure 3-10). Exhibit 2 shows the total outflow in 2022-2023 was approximately half of what was calculated in 2004-2005 into the Centro sub-area. However, as shown in Exhibit 6 (described in the section below), the surface flow at the Barstow gage was less than ten percent of what was observed in 2004-2005. Further, **Exhibit 3** MWA/Watermaster shows the Proposed Judgment Subsurface obligation from Alto to the Baja Sub-area. This obligation assumes a minimum subsurface flow, a baseflow guarantee, the Alto TZ "water bridge," and no interference with storm flows.

MWA/Watermaster referred to a concept called "water bridge" to explain water movement from the Alto TZ sub-area to the Centro sub-area (URS Mojave River Transition Zone Recharge Project Page 80). This

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concept assumes that if water levels are relatively stable (with no change in storage), the flow coming into a sub-area will equal the flow coming out of the sub-area.

### SOURCE OF OBLIGATION FLOW VALUES IN THE JUDGMENT

The current estimate of subsurface flow between the Alto sub-area and Centro sub-area is 2,000 AFY in the Judgment and is used in the Watermaster Annual Reports (Judgment, G-2, Watermaster Annual Report 2023). These estimates are based on published volumes reported more than 70 years ago (DWR Bulletin 84, 1967). Additionally, the location where these calculations were measured is around 3 miles (Community of Helendale) from the actual legal basin boundary (the MWA sub-basin boundary) as defined in the Judgment. As the climate is changing, these calculations need to be revisited with flow data that is more relevant than the flow rates fied to periods that were much wetter than today.

### STREAM GAGE

Over the years, the United States Geological Survey (USGS) and others have maintained and operated multiple stream-gaging stations along the Mojave River. Some of these gages were only operational for a short period of time, while others have had prolonged periods of operations. **Exhibit 1** shows all known gages and the period of time that they were in operation. Several locations have been measured as only a single one-time survey of surface water flow. The stream gaging stations used by the Watermaster to evaluate the surface flow of the Mojave River are the Mojave River Forks, Dam Deep Creek, Lower Narrows, Barstow, and Afton Canyon gages. These gages cover approximately 117 miles of the river, including the flow between sub-areas Alto, Centro, and Baja.

Historically, multiple stream gages have been within the Alto TZ and the Centro sub-area upstream of the City of Barstow. These included Upper Narrows, Point of Rocks, Wild Crossing, and Hodge gages. In 2022, USGS re-established the gage at Hodge and established a new gage at Daggett (see Exhibit 1).

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groundwater levels within the Alto TZ sub-area. A review of the groundwater levels obtained from USGS NWIS website (https://nwis.waterdata.usgs.gov/usa/nwis/gwlevels) for USGS well 08N04W31R01 with groundwater level records dating back to the 1930s indicates that groundwater levels have declined since the 1950s and have never fully recovered to those historic 1930-1950 levels (see Exhibit 5: Groundwater levels).

Table 1: MWA/Watermaster Key Groundwater Wells-Transition Zone

The MWA/Watermaster maintains a key groundwater well monitoring program within its agency's

management area. These groundwater wells are located throughout the various sub-areas. Table 1 and

Exhibit 4: Groundwater Monitoring Wells listed below show the wells used for determining the overall

Well ID	Depth (ft, bgs)	Screen Interval (ft, bgs)	Length of Record (years) 1994-2024	
08N04W19G04	103.3	80-100		
08N04W29E06	41.6	30-40	1994-2024	
07N05W23R03	315	295-315	1991-2024	
07N05W24R08	50	45-50	1991-2021	
06N04W30K16	31.6	26-31	2008-2023	
06N04W30J05	23.9	Unknown	1996-2024	
06N04W29M01	22.5	Unknown	1991-2021	

Groundwater levels data obtained from the USGS NWIS website (<a href="https://nwis.waterdata.usgs.gov/">https://nwis.waterdata.usgs.gov/</a>) usa/nwis/gwlevels) shows that three of the seven key wells (08N04W19G04, 08N04W29E06, and 06N04W29M01) listed above have been in decline since 2012 (see **Exhibit 5**: Groundwater levels).

### HISTORICAL CALCULATION OF FLOW

The annual obligation of flow between sub-areas includes both baseflow (surface water flow) and subsurface (groundwater) flow. The 23,000 AFY obligation to Alto TZ does not flow directly into the Centro sub-area. It is questionable if this flow does make its way to the Alto-Centro sub-area boundary, just downstream from the Community of Helendale. The MWA/Watermaster has admitted that there is no accounting of how much-obligated water flows into the Centro sub-area from the Alto TZ because there

are no active stream gages near this boundary (Mojave Basin Area Watermaster Appendix A, Page 1). Historically, at least 3 gages have been between the existing Lower Narrows (Alto TZ) and Barstow (Centro sub-area) stream gages. These are the Point of Rocks, Wild Crossing, and Hodge historical gages. These gages, however, only have records of between 3 to 24 years. In 2022, the USGS re-established the Hodge gage and a new one at Daggett (located downstream of the Barstow Gage).

The baseflow obligation of 21,000 AFY to the Alto TZ is calculated using the Lower Narrows gage records. Baseflow calculations for the purpose of basin obligation exclude storm flows (Judgment, see defined terms above). The baseflow accounting does, however, include supplemental wastewater provided by VVWRA, starting in 1986. This treated wastewater is discharged to the Mojave River in the Alto TZ about 4 miles downstream of the Lower Narrows gage. Records found in MWA annual reports indicate that discharges from VVWRA have increased, with discharge varying from 4,346 to 15,095 AFY between 1986 and 2023 (as obtained from Watermaster Annual Reports 1986 through 2023).

A review of historical monthly aerial photographs viewed on Planet (https://www.planet.com/) and stream gages obtained from USGS NWIS (https://nwis.waterdata.usgs.gov/) between the Lower Narrows and Barstow indicates that subsurface baseflow into the Centro sub-area is limited in duration and volume. With little, if any, surface water reaching the actual boundary. Dry-flow year baseflow into the Centro sub-area is only a fraction of the 21,000 AFY that flows into the Alto TZ.

Exhibit 6: Historical Annual Stream Gage Flow Data, is a table that shows a compilation of Annual stream flow measured at Mojave River stream gages since 1909, note that not all of the gages have been operational during the same time period. These records were obtained from USGS NWIS (<a href="https://nwis.waterdatausgs.gov/">https://nwis.waterdatausgs.gov/</a>). The 21,000 AFY of surface water inflow is calculated from stream gage records at the Lower Narrows stream gage. Stream gage data at the Lower Narrows before VVWRA (Exhibit 6) shows annual flows between 16,651 and 28,235 AFY with an average of 21,619 AFY during average low-flow years (dry

year). At the Wild Crossing stream gage, the maximum flow rate observed during non-storm years was 3,779 AFY during the 4 years the gage was operational. At the Hodge stream gage, during dry-flow years, the maximum flow rate observed was 2,317 AFY, and during the 25 years, the gage was operational.

The subsurface flow (groundwater) is assumed to be 2,000 AFY at the Alto TZ and Centro sub-area boundary. This value for subsurface flow used in the Judgment for sub-area obligation was taken from DWR Bulletin 84, published in 1967. The sub-area delineated by DWR where these flows were assumed was located near the Community of Helendale which is not the actual legally defined boundary by the Judgment. In reviewing Bulletin 84, there is no actual calculation or explanation as to how the 2,000 AFY was calculated. However, this number has been passed along from report to report without ever being reevaluated and adjusted (see **Table 2**: Subsurface Flow).

Table 2: Subsurface Flow

Boundary	Source	Year	Subsurface flow (AFY)	Location
TZ-Centro	DWR	1967	2,000	At 1967 Sub-unit boundary
TZ-Centro	Judgment	1996	2,000	At 1967 Sub-unit boundary*
TZ-Centro	USGS 2001	2001	5,000-6,000	At Helendale Fault
TZ-Centro	USGS 2001	2000	1,566	At Helendale Fault
TZ-Centro	URS	2002	4,600	At Helendale Fault
TZ-Centro	Laton	2004	1,100-2,220	At Helendale Fault
Alto-TZ	Webb	2000	4,590	At Lower Narrows
Alto-TZ	URS	2002	4,900	At Lower Narrows

\*from DWR, 1967

It is impossible to validate the Judgment obligations without actual data (either stream gage or groundwater). This becomes even more important as climate changes and the stresses placed on the water resources of the MWA/Watermaster area increase; therefore, this should be reevaluated yearly.

As discussed above review of monthly aerial photography Planet (https://www.planet.com/) and USGS stream records for the previous 8 water years, indicates that baseflow to the City of Barstow has only occurred twice during those 8 years. The observed baseflow was 169 AF during the 2019 water year and

8,688 during the 2023 water year. Water years 2016, 2017, 2018, 2020, 2021, and 2022 were considered dry-flow years. Of those dry years, no flow was observed past the historic Hodge stream gage location. For two years (2017 and 2020), baseflow was observed past the historic Wild Crossing gage. In 4 of the dry years (2016, 2018, 2021, and 2022), baseflow only made it past the historic Point of Rocks gage location but ceased before the historic Wild Crossing gage. If gages had been operating at these historic locations, a better understanding of baseflow in this area could be assessed. The aerial photographs indicate that no flow reached the Centro sub-area in 4 of the 8 years. On the remaining 2 dry-flow years, low baseflow entering the Centro sub-area seemed minimal because most flows ceased before the historic Wild Crossing gage. Still, there is no way to quantify the baseflow because there are no gages at the Alto – Centro sub-area boundary.

### DEFICIENCIES OF THE MONITORING PROGRAM

An updated monitoring program, with actual data at the point of compliance, is needed in order to evaluate the actual flows between sub-areas. The following are several easily implemented changes that would provide data to close the gap on actual obligated flows at the sub-area boundaries.

The first problem is the location of active stream gages. The Lower Narrows gage is 19 miles upstream, the compliance boundary between Alto and Centro sub-areas. The same is true of the Barstow gage as it is 26 miles downstream of the same boundary (Exhibit 1). In the past, several gages would be more useful to Watermaster in determining actual baseflow at the Alto – Centro sub-area boundaries, such as the Point of Rocks and Wild Crossing. The gage near Hodge was re-established; however, it has only been in operation since 2022 (Exhibit 1). Though further from the Alto – Centro sub-area boundary, this gage is suited for determining surface flows within the Centro sub-area. During its previous operation, the Hodge gage recorded significant storm seasons in 1978, 1980, 1983, and 1993. The Point of Rocks gage was previously only operational for 4 years, and it survived the 1969 storm season with the highest annual flow rate measured at the Lower Narrows gage (Exhibit 6).

Stream gaging in an arid environment with flow ranging from zero to significant is difficult. There are several solutions to the problem. One is to re-establish the previous stream gages. Second, it would be at least a minimum to install live video feeds at select locations along the Mojave River. Though not qualitative, this would at least provide real-time quantitative information MWA/Watermaster and the subarea constituents.

MWA/Watermaster should provide real-time groundwater levels within all the agency's sub-areas via their Key Well program. This should be tied to real-time groundwater production and the above baseflow in order to truly manage the water under the control of the agency. Based upon the Judgment, this seems to be well within the rights of WMA/Watermaster.

In order to provide total transparency in water management, MWA/Watermaster should have real-time monitoring on its website. This could be tied to actual subarea water balance calculations and give invaluable information to the MWA/Watermaster constituents. This would also allow for the constituents to plan for any potential ramp-down or changes in allowable free production allowances.

# SUMMARIZED FROM PREVIOUS DECLARATION: Declaration of Dr. W. Richard Laton, October 1, 2018 (Appendix C)

Groundwater modeling by the USGS has shown that groundwater pumping in upstream subareas has a substantial impact on storage downstream in both the Centro and Baja sub-areas. Todd Engineering (Conceptual Hydrogeologic Model, July 2013, Page ES-11) stated the following:

"Based on simulations with the USGS model, upper basin pumping (not including Centro) was estimated to account for about 21 percent of groundwater lost from storage in the Baja Subarea over the base period (1931 to 1990). The USGS did not simulate the effect of upstream pumping in Centro on stream discharge and recharge in Baja."

Based on this loss in storage, we calculate a loss of 92,750 AF for the 25 years from 1993-94 to the 2017-2018 water years or 3,710 AFY to the Baja sub-area. This unaccounted overdraft is based on the loss of storage during the base period (1931-1990) and projected forward into the adjudication period. These losses were unaccounted for in the MWA/Watermaster initial calculations.

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To summarize, due to the historical distribution of storm events that lead to storm flows that ultimately flow into the Baja sub-area and the overestimate calculated by the MWA/Watermaster of about 225,000 AF of flow have not been realized and thus have contributed to sub-area overdrafts. Additionally, the MWA/Watermaster has not fully considered the effects of pumping in up-gradient sub-areas as the USGS modeled. To date, this has not been evaluated nor included in the MWA/Watermaster's calculations for water budgets.

The Centro sub-area groundwater is some 25 feet lower than pre-Judgment, but generally has remained constant since the adjudication. This creates the illusion of the Centro subarea being in balance and sending the required outflow to downstream sub-areas, when in fact, the water never spills over to flow downstream, resulting in the loss of subsurface flow that should have flowed annually to the Baja sub-area.

### CONCLUSION AND OPINIONS

In 2001, the USGS stated, "Overall, pumping in the lower region does not negatively affect the upper region: however, pumping in the upper region negatively affects the lower region by decreasing recharge from the Mojave River." (Stamos et al., 2001).

Based on the information in the declaration and the above statement, the following opinions can be drawn.

Baseflow is that portion of the total surface flow measured annually, which remains after subtracting storm flow. Storm flow does not count towards any baseflow obligation to any subarea.

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- The calculated water obligation to the Centro sub-area is not based on sound science. There is limited to no data at the compliance boundary (baseflow or subsurface flow).
- MWA/Watermaster cannot adequately provide an estimate of water moving from Alto to Centro sub-areas given the lack of data; specifically, the amount of water flowing out of Alto TZ and into the Centro sub-area and to a lesser degree from Centro to Baja sub-area.
- MWA/Watermaster has failed to meet their duty by not adequately installing stream gages and monitoring wells to collect boundary-specific data.
- Baseline conditions used in the original Judgment do not apply to current conditions. The climate
  has been and is evolving. The change in stresses to exiting water resource conditions and the
  original deficiencies from previous studies (from as far back as the last century) all need to be revisited with actual data.
- The 21,000 AFY of baseflow obligation to the Alto TZ (which is part of the Alto sub-area) and the subsequent obligation of baseflow to the next downstream sub-area (Centro) is essentially nonexistent.
- Simple aerial imagery analysis shows that the obligated baseflow is not making its way to the
   Centro sub-area and, therefore, not making it to the Centro-Baja sub-area boundary.
- It is critical that the historical stream gages closer to the compliance boundary be re-established between the Alto and Centro sub-areas.
- MWA/Watermaster has failed to meet their duty by not adequately measuring or monitoring water flow between sub-areas. As such, there has been calculable harm done to downstream sub-areas.
- Based on a loss in storage in the Centro sub-area, the Baja sub-area has seen a realized loss of 92,750 AF for the 25 years since 1993-94 water year or 3,710 AFY.

This declaration sets forth my opinions and the information upon which I relied (see, **Appendix B** and **Exhibit 7**).

I declare under penalty of perjury of the laws of the State of California that the foregoing is true and correct and that I have executed this declaration on the 9<sup>th</sup> day of October 2024, in Santa Ana, California.

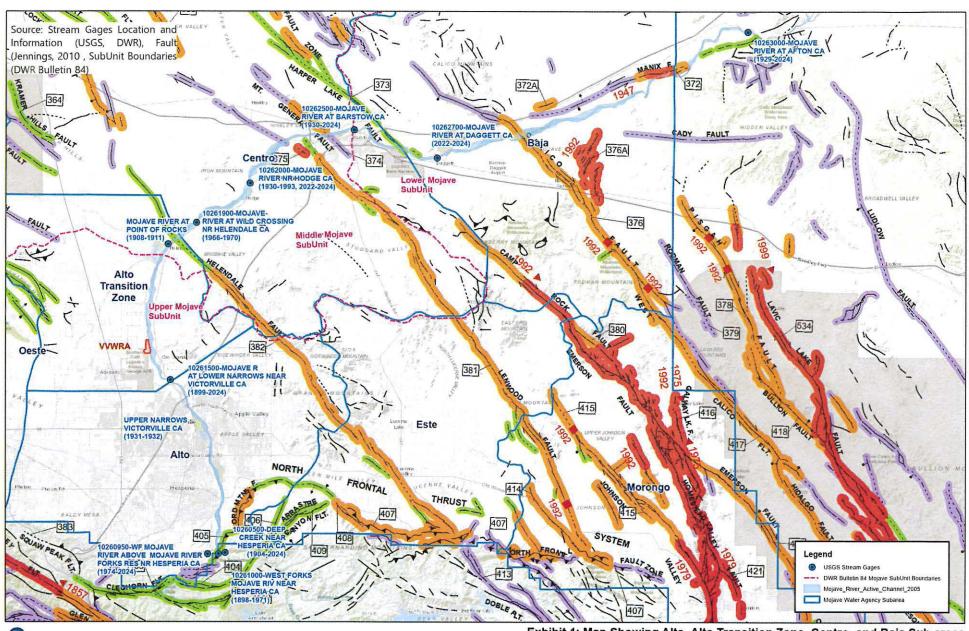
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**Dr. W. Richard Laton, PG, CHg**President of Earth Forensics, Inc.
Principal Consultant, Hydrogeology

Declaration of Dr. W. Richard Laton, PG, CHg Page 13

## **Exhibits**

## Exhibit 1



Gearthforensics, inc.

Exhibit 1: Map Showing Alto, Alto Transition Zone, Centro, and Baja Sub-areas

## Exhibit 2

### Transition Zone Water Balance

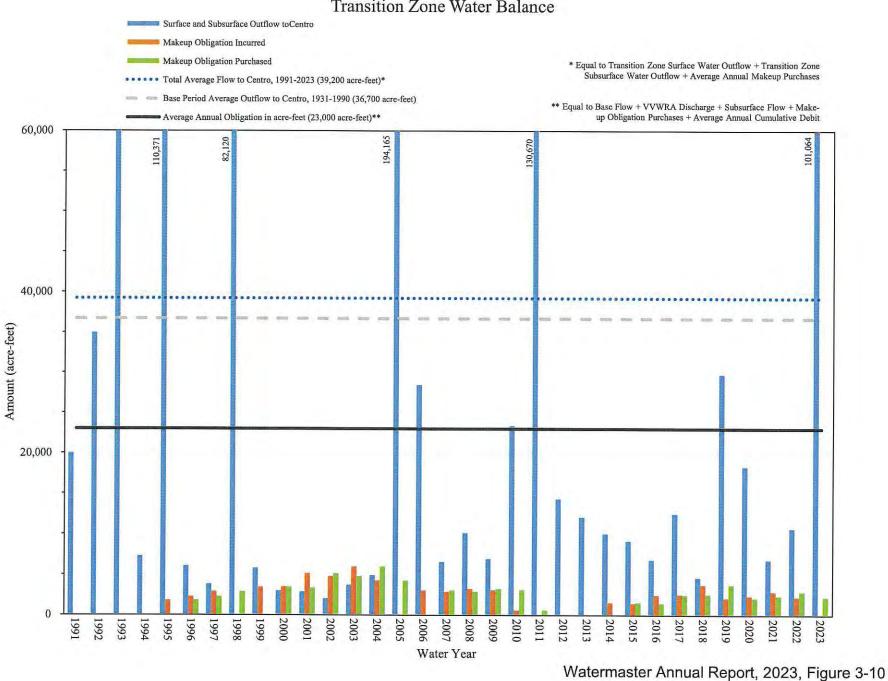
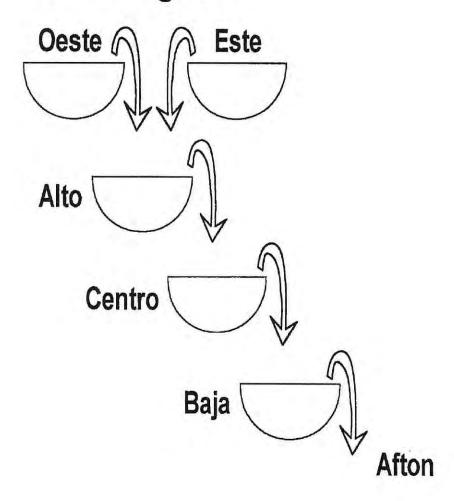


FIGURE 3-10

### Exhibit 3

## **Proposed Judgement**

# **Subarea Obligation**



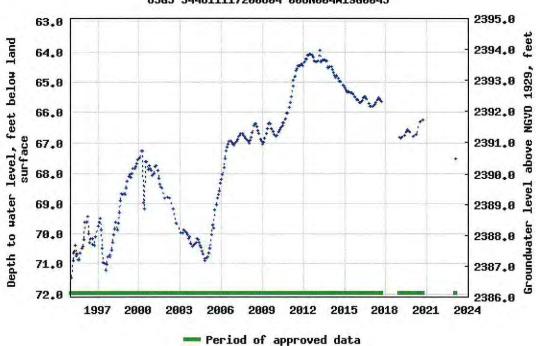
## Exhibit 4

## Exhibit 5

### Attachment D: Groundwater Levels

- 08N04W19G04
- Land-surface elevation 2,458.00 feet above NGVD29
- The depth of the well is 103.3 feet below land surface.
- The depth of the hole is 320 feet below land surface.

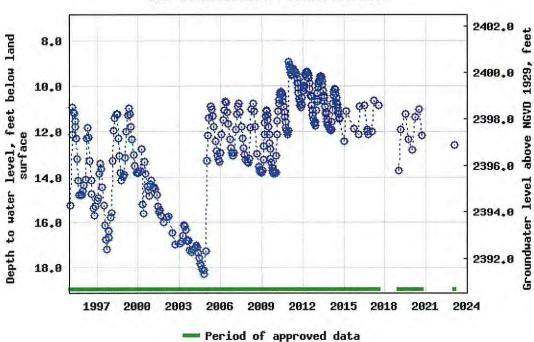
### USGS 344611117200804 008N004H19G004S



### 08N04W29E06

Land-surface elevation 2,409.49 feet above NGVD29 The depth of the well is 41.6 feet below land surface. The depth of the hole is 309 feet below land surface.

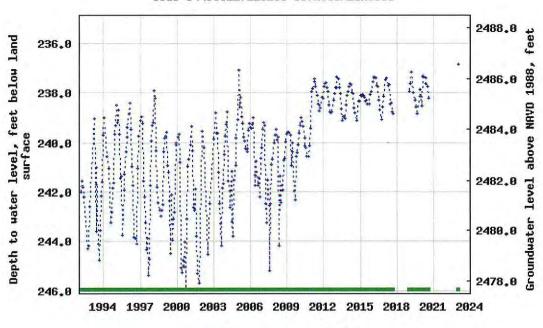
USGS 344524117193404 008N004H29E006S



### o 07N05W23R03

Land-surface elevation 2,723.5 feet above NAVD88 The depth of the well is 311.7 feet below land surface. The depth of the hole is 760 feet below land surface.

### USGS 344036117215203 007N005H23R003S

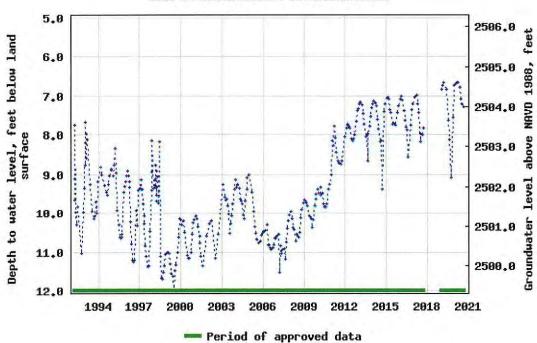


- Period of approved data

### o 07N05W24R08

Land-surface elevation 2,511.3 feet above NAVD88 The depth of the well is 49.2 feet below land surface. The depth of the hole is 600 feet below land surface.

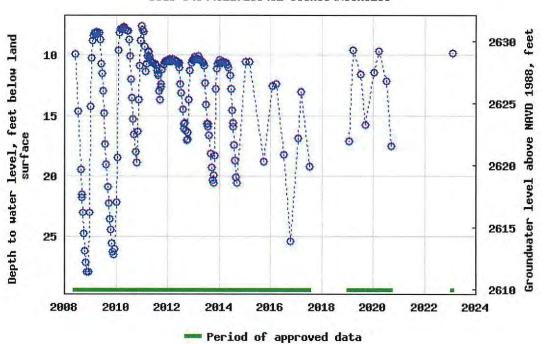




### o 06N04W30K14-16

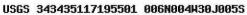
Land-surface elevation 2,639.1 feet above NAVD88 The depth of the well is 31.6 feet below land surface. The depth of the hole is 32.5 feet below land surface.

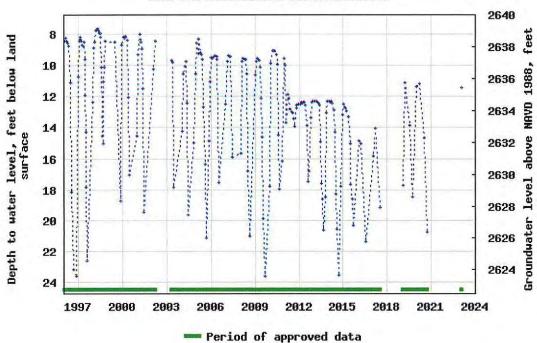
### USGS 343443117200401 006N004H30K016S



### o 06N04W30J05

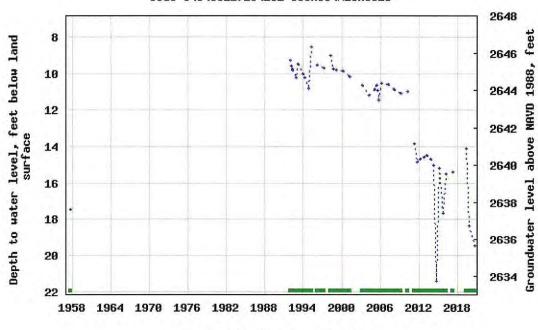
Land-surface elevation 2,647.0 feet above NAVD88 The depth of the well is 23.9 feet below land surface. The depth of the hole is 24.5 feet below land surface.





- 06N04W29M01
- Land-surface elevation 2,655.0 feet above NAVD88
- The depth of the well is 22.5 feet below land surface.

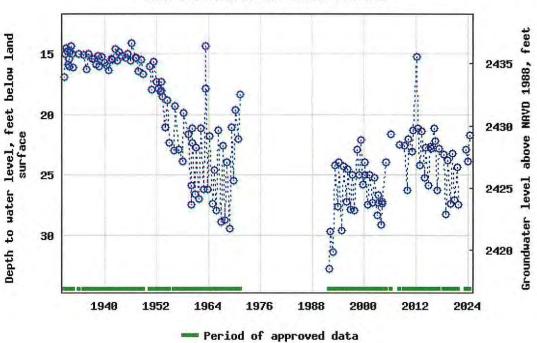
### USGS 343433117194201 006N004H29H001S



- Period of approved data

- Land-surface elevation 2,451 feet above NAVD88
- The depth of the well is 59 feet below land surface.

### USGS 344401117194701 008N004H31R001S



https://ca.water.usgs.gov/mojave/mojave-water-data.html

### Exhibit 6

### Exhibit 6: Historic Annual Flow Gage Data

Water Year	1909	1910	1911		1930	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940	1941	1942	1943	1944	1945	1946	1947	1948	1949	1950	1951	1952	1953	1954	1955	1956	1957
Vest Fork+Deep Creek	95,200	181,000	147,000		34,316	15,471	101,500	22,443	16,087	57,555	24,000	169,119	218,783	40,470	31,065	161,083	25,990	149,934	85,514	70,732	54,515	50,243	13,611	23,022	12,409	2,215	102,659	8,818	54,370	17,904	16,152	22,04
pper Narrows						22,170	84,200									1000									8 15 1			100		Y		100
ower Narrows	90,700	138,000	130,000	(Designation of	-	22,463	B3,950	23,915	23,820	33,805	20,366	150,246	188,037	29,675	27,394	143,332	25,789	127,293	77,429	54,641	43,228	37,206	26,261	22,854	21,628	20,824	66,591	21,810	31,232	22,528	21,691	20,55
Point of Rocks	80,100	111,000	112,765									41													Alle Sill							120
Wild Crossing		1000	- 119			A. Carlo		1000									1 200	1	T The same					200		16661			- 10		P0-5-4	1000
lodge	300					2,317	59,510								100-20			18 32	II- Washington							Name (S	TO SHE	Bus		60 S	E-SEC.	
Barstow						0	37,374	0	0	1,184	0	103,879	138,094	550	0	96,003	100	90,974	36,155	22,087	12,577	2,876	0	0	0	0	12,514	0	0	0	0	0
Dagett											13.34	Test in the				100					100	Section 2	)	-	1-7-1	/ Y			1000	LONG T	5.55	35
Afton					947	1,267	18,850	1,000	1,000	1,000	1,000	54,070	72,200	1,000	1,000	49,900	1,000	47,200	18,200	10,800	6,720	1,000	1,000	1,000	1,000	1,000	2,190	990	953	913	901	752
Water Year	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
West Fork+Deep Creek	148,920	18,382	8,761	4,483	67,257	5,645	10,867	21,458	116,269	128,070	24,542	341,495	17,107	20,423	21,647	40,687	18,316	16,847	23,638	11,699	362,635	112,215	305,310	16,094	57,773	262,148	29,248	24,542	45,972	10,816	17,332	10,94
Jpper Narrows				12					V 17 2	Consul		10000			The same	100		1000				20			49-20-2			-				
ower Narrows	98,041	20,341	19,229	18,904	26,755	17,034	17,052	16,797	51,010	74,212	18,745	291,090	23,117	20,416	22,733	34,750	17,737	16,651	20,126	28,235	209,082	72,324	228,918	23,167	35,330	189,173	26,932	21,067	16,941	14,479	16,072	11,51
Paint of Rocks			A STATE OF THE PARTY OF THE PAR		100	100	133	1550	10.00		7 B 307	Value of	9.5	200	1	1000			100							V. E. SER						
Wild Crossing			- 3	8.2						40,977	14	229,063	3,779		100	10			0.5								C 3 - 5	THE PARTY NAMED IN	1 33		1	1
lodge				FEET OF			1000	25.3			7	1000	200	0	660	4,387	4	0	0	10	147,472	31,855	171,580	0	10,136	148,124	1,962	0	3	0	0	0
Barstow	20,067	4	0	0	734	0	1	6	6,352	7,693	0	146,600	0	0	43	151	1	0	1	2	50,460	5,560	137,264	0	1	92,957	42	0	0	0	В	0
Dagett						1883						Sec. Land	12 200	00000	DESTR		70.33				-										13 C	
ftan	2,784	596	681	669	563	752	537	566	4,782	1,466	356	72,730	543	360	595	310	436	159	295	898	46,841	1,200	66,700	1,383	1,050	13,321	1,810	682	550	562	912	432
																										-	-		45,846	4,645	5,602	1000

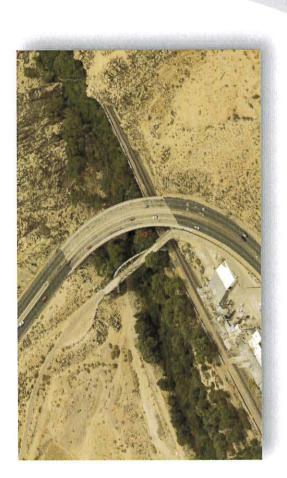
Water Year	1990	1991	1992	1993	1994	1995	1995	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
West Fork+Deep Creek	7,783	38,262	75,293	428,516	36,271	198,946	34,750	31,710	169,915	9,288	19,236	17,404	2,454	34,178	36,778	355,251	106,930	5,877	50,243	30,899	102,441	210,095	29,683	9,419	12,083	9,035	10,664	57,483	16,275	90,641	56,469	4,213	19,670	250,275
Upper Narrows				U SE								State!	200	5 6 5				100			1				2.58000			555						10000
Lower Narrows	8,905	10,932	24,470	285,388	10,932	113,301	11,004	8,181	83,473	9,412	6,972	5,618	4,554	6,248	5,372	192,575	27,221	4,937	9,122	4,366	19,185	126,405	9,484	7,312	6,784	5,611	4,952	9,629	3,786	27,511	15,421	4,923	3,967	96,577
Point of Rocks															de la lace								20.00	) a										
Wild Crossing								133					200		1	1 - 1 - 5			2 4 5 1	1									N.S.				-4	The same
Hodge	0	0	2,128	181,716						100											beer 0	No.	FERM	1	0.00				Q	Distance of the last				84,415
Barstow	0	0	28	122,785	0	11,077	0	0	10,498	0	0	0	0	0	0	126,187	182	0	10	1	374	23,384	0	0	42	0	0	0	0	169	0	0	0	8,688
Dagett							B1.50					15:55	The state of	12.00		The state			100				5533					1000	10000					4,445
Afton	547	738	626	66,605	484	434	631	646	1,289	565	282	350	239	248	392	44,669	185	150	166	112	190	6,407	301	117	1,404	366	159	292	197	86	245	89	1144	1,028
VVWRA .	6,371	7,308	7,428	7,356	7,789	7,958	8.512	8,728	9,378	8,776	3,055	9,306	9,739	10,317	11,485	15,855	15,568	13.096	13,981	13,664	14,555	14,868	10,724	34,336	12,518	12,942	12,990	13,272	12,870	15,715	13,719	13,346	15,065	16,216

### incomplete, Estimated

I OW FIGW YEARS. Years where less than 29,000 AF measred at Lower Namows
Years where over 29,000 AF, but less than 300,000 AF were measured at Lower Namows
STOM YEARS: Years where over 100,000 AF were measured at Lower Namows

Water Year [YEAR]= October 1, [YEAR-1] to Septeber 30, [YEAR]

### Exhibit 7



Surface and
Groundwater Flows to
the Alto Transition
Zone, Centro, and
Baja sub-area

earthforensics, inc.

### Mojave Basin

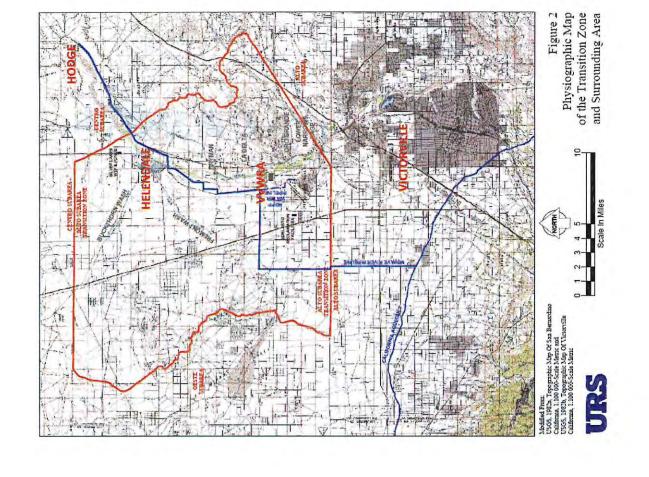
## TENTRO TENTRO

Location of Transition Zone



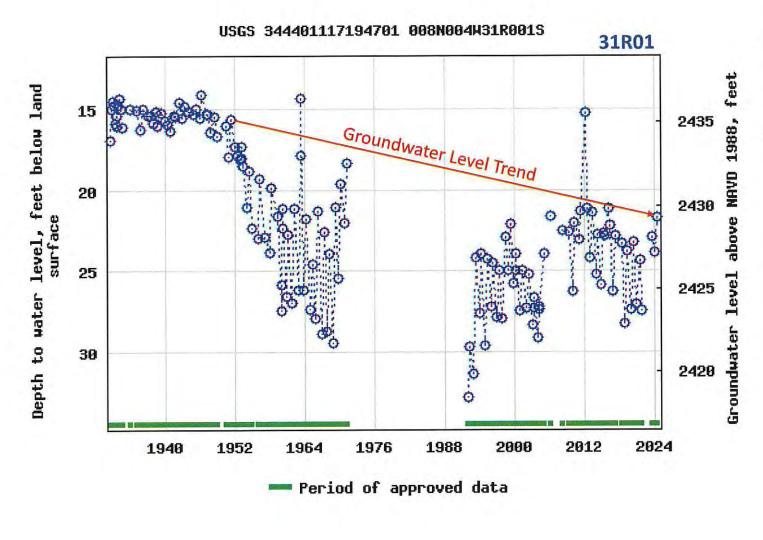


### Transition Zone

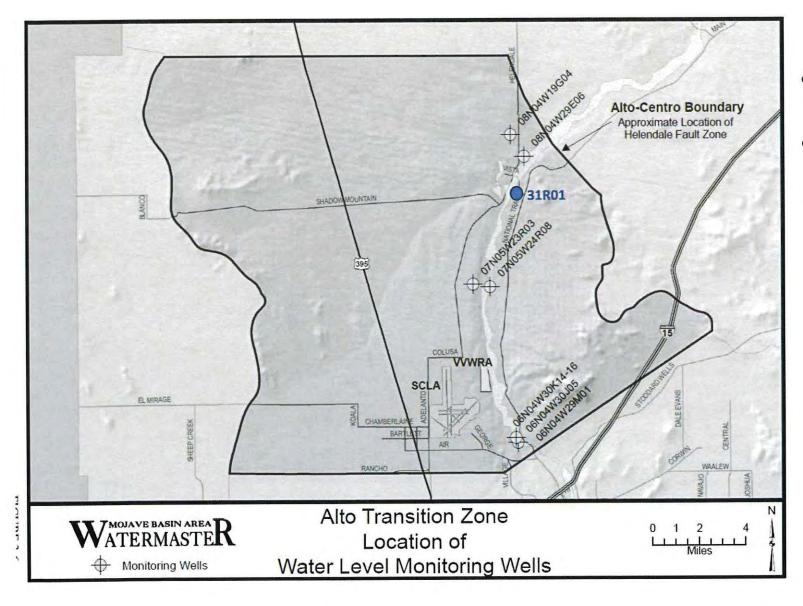


## Groundwater Wells



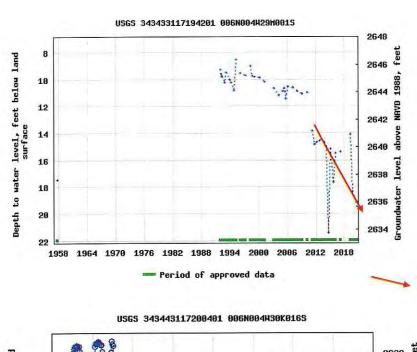


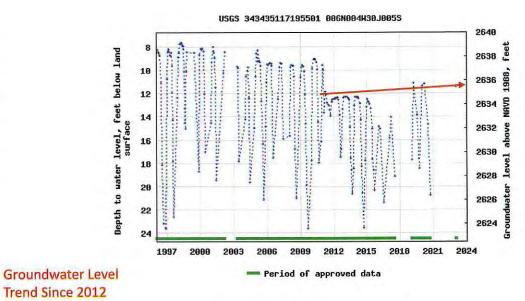
- Ground Water Decline since about 1950
- See next slide for location

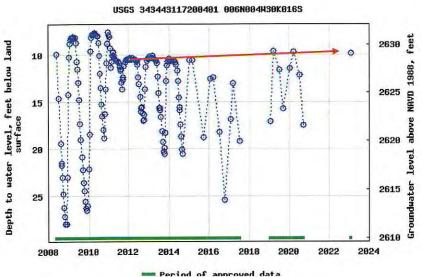


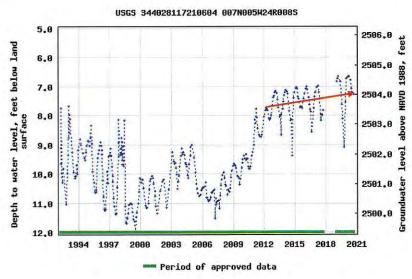
- Location of well 31R01
- Location of Transition Zone Key Wells

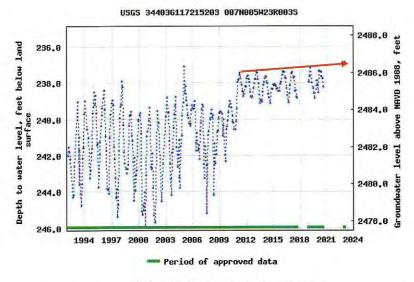
Well ID	Depth (ft, bgs)	Screen Interval (ft, bgs)	Length of Record (years)
08N04W19G04	103.3	80-100	1994-2024
08N04W29E06	41.6	30-40	1994-2024
07N05W23R03	315	295-315	1991-2024
07N05W24R08	50	45-50	1991-2021
06N04W30K16	31.6	26-31	2008-2023
06N04W30J05	23.9	Unknown	1996-2024
06N04W29M01	22.5	Unknown	1991-2021

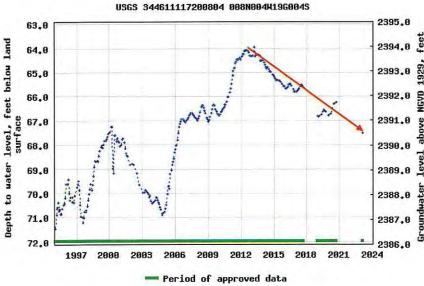


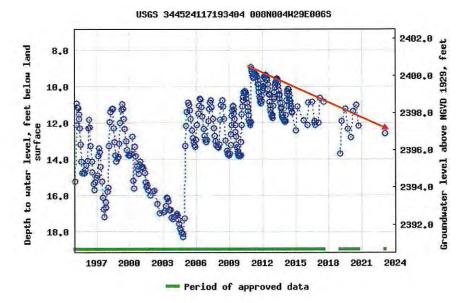










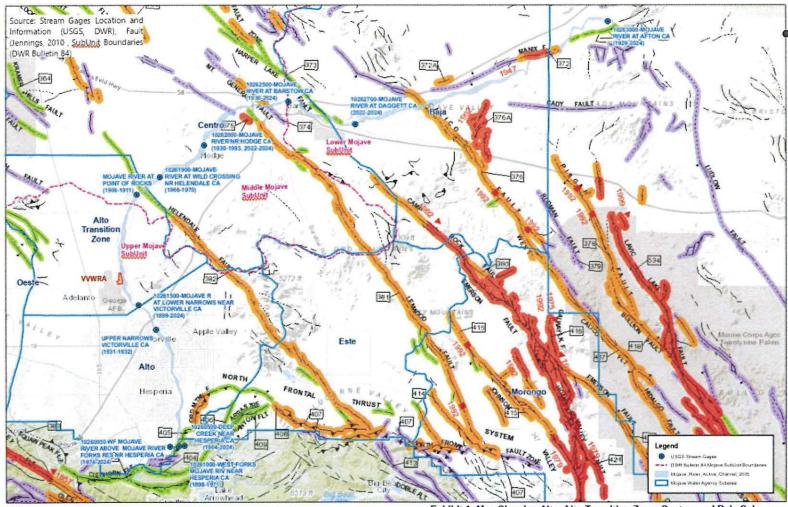


Groundwater Level Trend Since 2012

 Groundwater level decline in 3 of 7 wells since 2012

### Stream Gages





### Location of Stream Gages

Exhibit 1: Map Showing Alto, Alto Transition Zone, Centro, and Baja Sub-areas

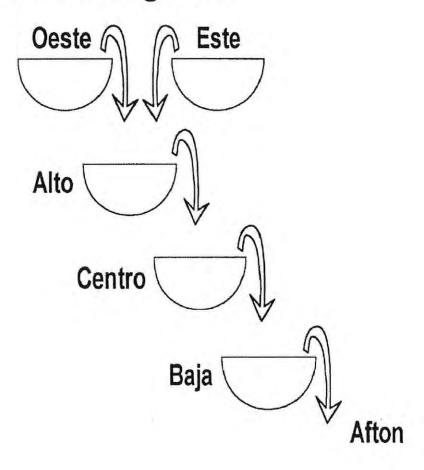
Gearthforensics. inc

# Subarea Obligation



### **Proposed Judgement**

### **Subarea Obligation**

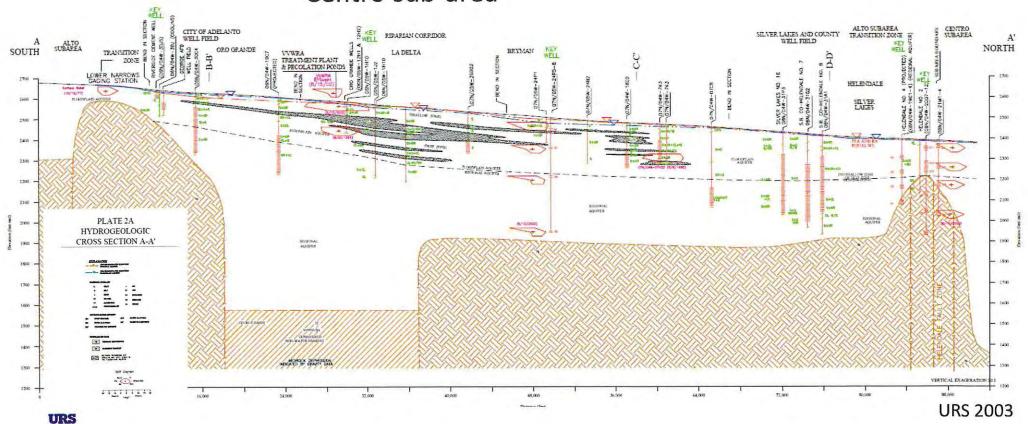


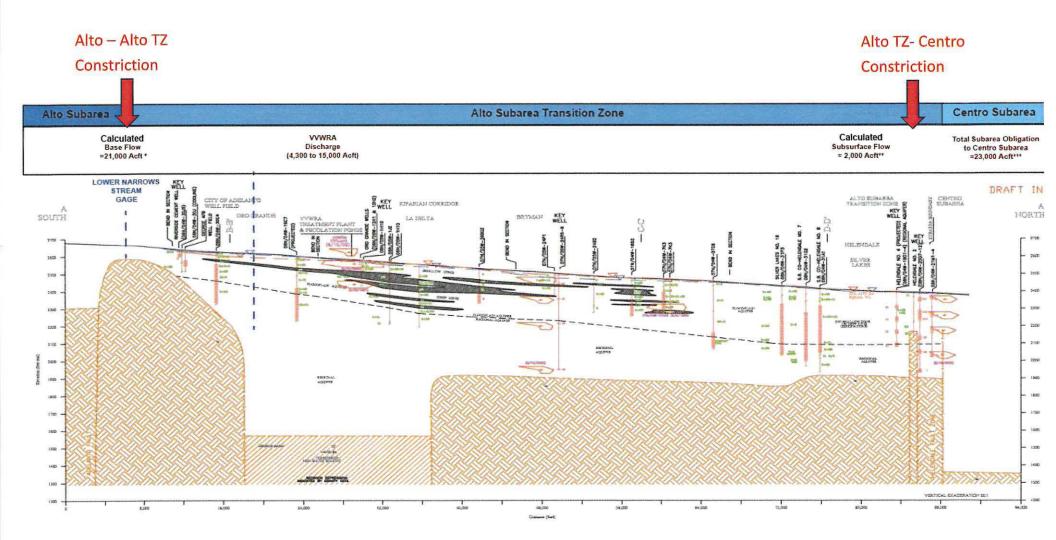
Alto – Alto TZ
Constriction

- Transition Zone Subsurface Flow
- Groundwater levels must be higher than construction for groundwater to flow into Centro sub-area

Alto TZ- Centro
Constriction







### Published subsurface flows between basins

Boundary	Source	Year	Subsurface flow (AFY)	Location
TZ-Centro	DWR	1967	2,000	At 1967 Subunit boundary
TZ-Centro	Judgement	1996	2,000	At 1967 Subunit boundary*
TZ-Centro	USGS 2001	2001	5,000-6,000	At Helendale Fault
TZ-Centro	USGS 2001	2000	1,566	At Helendale Fault
TZ-Centro	URS	2002	4,600	At Helendale Fault
TZ-Centro	Laton	2004	1,100-2,220	At Helendale Fault
Alto-TZ	Webb	2000	4,590	At Lower Narrows
Alto-TZ	URS	2002	4,900	At Lower Narrows

### Conclusion

- Baseflow is that portion of the total surface flow measured annually, which remains after subtracting storm flow. Storm flow does not count towards any baseflow obligation to any sub-area.
- The calculated water obligation to the Centro sub-area is not based on sound science. There is limited to no data at the compliance boundary (baseflow or subsurface flow).
- MWA/Watermaster cannot adequately provide an estimate of water moving from Alto to Centro sub-areas given the lack of data; specifically, the amount of water flowing out of Alto TZ and into the Centro sub-area and to a lesser degree from Centro to Baja sub-area.
- MWA/Watermaster has failed to meet their duty by not adequately installing stream gages and monitoring wells to collect boundary-specific data.
- Baseline conditions used in the original Judgment do not apply to current conditions. The climate has been and is evolving. The change in stresses to exiting water resource
   conditions and the original deficiencies from previous studies (from as far back as the last century) all need to be re-visited with actual data.
- The 21,000 AFY of baseflow obligation to the Alto TZ (which is part of the Alto sub-area) and the subsequent obligation of baseflow to the next downstream sub-area (Centro) is essentially non-existent.
- Simple aerial imagery analysis shows that the obligated baseflow is not making its way to the Centro sub-area and, therefore, not making it to the Centro-Baja sub-area boundary.
- It is critical that the historical stream gages closer to the compliance boundary be re-established between the Alto and Centro sub-areas.
- MWA/Watermaster has failed to meet their duty by not adequately measuring or monitoring water flow between sub-areas. As such, there has been calculable harm done to downstream sub-areas.
- Based on a loss in storage in the Centro sub-area, the Baja sub-area has seen a realized loss of 92,750 AF for the 25 years since 1993-94 water year or 3,710 AFY.

### **Appendices**

### Appendix A



W. RICHARD LATON, Ph.D.

12532 VISTA PANORAMA NORTH TUSTIN, CA 92705 714-296-4055

wlaton@earthforensics.com

### VITAE

### **EDUCATION**

Ph.D. (1997), Geology with an emphasis in Hydrogeology, Western Michigan University

Groundwater - Kalamazoo River Interaction near the Parchment City Well Field, Parchment,

Michigan.

M.S. (1992), Environmental Earth Science (Coastal Geomorphology), Western Michigan University Small-Scale Coastal Cells as Control Mechanisms on Sediment Movement; Identification and Mapping.

B.A. (1989), Earth Science (Oceanography), Saint Cloud State University, Minnesota Density Flow Analysis of Turbidity Currents.

### PROFESSIONAL SUMMARY

Dr. Laton is an expert in the fields of geology/hydrology/hydrogeology. He is currently an Associate Professor of Hydrogeology in the Department of Geological Sciences, California State University, Fullerton, and the prestigious 2014 Ross Oliver Award winner. This continuation of a career includes years of teaching, consulting, litigation support, and management experience. Dr. Laton possesses extensive knowledge in the areas of geology, hydrogeology, fluvial geomorphology (including erosion and sediment transport), meteorology/climatology (including rainfall, RADAR analysis, and wind), hydrology and surface water, wetlands, coastal monitoring/geomorphology, natural hazards (such as land/mudslides, flooding, and earthquakes), soil and water contamination (fate and transport), CEQA, environmental field sampling techniques and well hydraulics-well design as well as environmental remote sensing/GIS. His classes at the university encompass topics including; water quality, environmental sampling, groundwater modeling, well hydraulics, oceanography, and basic geology. He enjoys introducing students to applied research and is the faculty advisor to many upper-level students. He has also acted as a consultant for numerous companies and agencies that need input on the above subjects and natural hazard assessment and mapping.

### CERTIFICATIONS

CHILLETTE				
California Geologist	(PG-7098)	California Hydrogeologist	(CHg-958)	
Alaska Geologist	(PG-673)	Oregon Geologist	(G2153)	
Arizona Geologist	(PG-42253)	Pennsylvania Geologist	(PG-5095)	
Florida Geologist	(PG-2618)	Texas Geologist	(PG-10018)	
Illinois Geologist	(196.001370)	Washington Geologist	(PG-2517)	
Indiana Geologist	(LPG-2191)	Washington Hydrogeologist	(CHg-2517)	
Minnesota Geologist	(PG-44868)			
New York Geologist	(PG-001222)	AIPG-Certified Geologist	(CPG-10544)	
North Carolina Geologist	(PG-2614)	European Geologist	(N-1128)	

### SELECTED CONSULTING, RESEARCH, AND EMPLOYMENT EXPERIENCE

### **Professional Profile**

2010 - Present, President of Earth Forensics Inc.

1995 - 2010, Partner (Owner Operator) with Environmental Science & Planning, LLC.

1998 - 2001 & 2007 - 2012, Senior Consultant with Earth Consultants International.

2001 - 2007, Consultant to Hromadka & Associates.

1996 - 1998, Senior Hydrogeologist with SimulProbe Technologies.

### 2010 - Present. Earth Forensics, Inc. President (www.earthforensics.com)

Project experience includes management, expert testimony, fieldwork, oversight, and training. Clients have included the State of California, various cities, private firms, law firms, and other consulting companies. **2024** 

- Torrance, CA. Retained to provide expert opinion associated with groundwater, soil, and soil vapor contamination (PCE, TCE, and 1,1 DCE) (Defense: <u>City of Torrance v. Hi-Shear Corp (Case No.: 2:17-cv-07732) (cross-complaint).</u>
- Colorado. Retained to aid in the Marshall Fire, water and meteorological issues, and GIS.
- Rolling Hills Estates, CA. Retained as an expert on groundwater and surface water impacts on a landslide.
- Encinitas, CA. Retained as an expert on flood damage.
- Los Angeles, CA. Retained as an expert on remediation, groundwater, soil, and soil vapor contamination (<u>LA County Metro Transportation v California Drop Forge</u>, et al. Case No. 2:23cv01728-MWF-KS).
- Vernon, CA. Retained as an expert on groundwater and vapor pathways associated with VOCs, SVOCs, and metals (Superfund).
- Ypsilanti, MI. Retained to evaluate remedial efforts related to the factory.
- Palos Verde, CA. Retained to assess surface water and groundwater impacts on landslides.
- Hicksville, NY. Retained to evaluate groundwater model and fate and transport of contaminants.
- Port of Morrow, OR. Retained to evaluate nitrate contamination (Plaintiff, <u>Pearson et al., v Port of Morrow, et al. Case No.).</u>

- El Dorado County, CA. Hired and retained to evaluate rainfall runoff and slope stability (Plaintiff, Poipao, et al., v County of El Dorado, Case No. 2:23-cv-01265-CKD)
- Corbett, OR. Hired and retained to evaluate water well design and standard of care (Defense, Corbett Water District v SCS Engineers, et al., Case No.)
- Wausau, WI. Hired and retained to evaluate the fate and transport of PFAS/PFOS.
- Orange County, CA. Hired and retained to discuss groundwater flow (Plaintiff, <u>Hadipour, et al., v</u> Moulton Niguel Water District, Case No. 30-2020-01176360-CU-EI-CJC)
- Endicott, NY. Retained to evaluate the fate and transport of contamination.
- Oklahoma. Retained to evaluate PFAS/PFOS contamination state-wide.
- Sarasota, CA. Retained as an expert on meteorology associated with flooding. Deposition and Trial Testimony (Plaintiff, Hedayati v. Bhatnagar, Case No. 19CV357264).
- Maui, HI. Retained as an expert on GIS and meteorology associated with wildfires.
- New Cambria, KS. Retained as an expert on hydrogeology/geology/sampling and fate and transport (Defense, Grit v Koch Remediation & Environmental Services, et al.).
- Coronado, CA. Retained as an expert on surface water flow.
- Pacific Palisades, CA. Retained as an expert on groundwater (Plaintiff, Nash v. Etco Homes, et al., Case No. 20SMCV01211).

- Los Angeles, CA. Retained as an expert on water sources and landslides.
- Claremont, CA. Hired to evaluate the source of high groundwater for multiple residential homes.
- San Deigo, CA. Retained as an expert on water damage (<u>Case No. 37-2023-00011116-CU-OR-CTL</u>).
- San Deigo, CA. Retained as an expert on flood damage.
- II, IN, NM, FL, and LA. Hired to evaluate the potential groundwater impacts associated with CO<sub>2</sub> Sequestration.
- Oceanside, CA. Hired to evaluate water issues surrounding a landslide.
- Dalton, NH. Hired by the City to review landfill permits and provide a written report.
- Orange County, CA. Hired to develop a dewatering plan for a landslide on an active landfill.
- Vernon, CA. Retained as an expert on groundwater and vapor pathways associated with VOCs, SVOCs, and metals. Expert Report, Rebuttal Report, Deposition and Trial (Plaintiffs, <u>CA DTSC</u> <u>v NL Industries, Inc, et al., Case No. 2:20-cv-11293-SVW-JPRx</u>).

- Orange County, CA. Hired to evaluate data gaps in the environmental analysis of landfill.
- Elysian, TX. Hired to evaluate the potential groundwater impacts associated with CO<sub>2</sub> Sequestration.
- Inglewood, CA. Retained as an expert on non-karst sinkholes. (Plaintiff, Maiden v City of Inglewood, et al., Case No. 19STCV20008)
- Southern California. Retained as a hydrogeology/hydrology/meteorology expert for various wildfires (Plaintiff).
- Riverside, CA. Retained as an expert on surface water flow associated with flood damages (Defense, HSU et al., v County of Riverside, Case No. CVR12101209).
- California. Retained as an expert on hydrogeology/hydrology/geology and meteorology associated with the Thomas Fire.
- Las Vegas, NV. Retained as an expert on water well design, drilling, development, and completion (Defense).
- Bakersfield, CA. Retained in association with oil field issues and leaking wells.
- Los Angeles County, CA. Retained as an expert on hydrogeology/hydrology and meteorology (Plaintiff, Werner, et al., v Azirian et al., Case No. 20smv01176).
- Union, IL. Retained as an expert on contamination from TCE and PCE in groundwater, soil, and soil vapor (Plaintiff, Harper v TechAlloy Company, Inc., et al., Case No. 19-LA-307).
- Encinitas, CA. Retained as an expert in fluvial geomorphology (Defense, <u>Trujillo et al., v City of Encinitas et al., Case No. 37-2021-00015834-cu-or-nc</u>).
- Tampa, FL. Retained as an expert on Lead in the environment (Plaintiff, <u>Brown v Gopher Resources, LLC et al., Case No.).</u>
- Newton, MA. Retained as an expert in mapping and GIS.
- Los Angeles County, CA. Retained as an expert on hydrogeology/hydrology and meteorology (Defense, Bowmont Holding LLC, et al., v CAS Construction et al., Case No. 21SMCV01401).
- Riverside County. Retained as an expert on hydrology (Defense).
- Franklin, IN. Retained as an expert on groundwater and vapor pathways associated with VOCs Expert Report, Deposition (Plaintiff, <u>Denny</u>, et al., v <u>Amphenol Corp</u>, et al., <u>Case No. 1:19CV-04757-JRS-DLP</u>).
- Encinitas, CA. Retained as an expert on groundwater-surface water interaction in bluff areas (Defense, Davis et al., v City of Encinitas et al., Case No. 37-2020-00030315-cu-np-nc).
- Illinois and Indiana. Hired to evaluate the potential groundwater impacts associated with CO<sub>2</sub> Sequestration.
- Maryland. Retained as an expert on impacted soil classification and potential for reuse (Defense, MCM Management Corp v DXI Construction, Case No. C-03-CV-21-003006).

- New Jersey and Pennsylvania. Retained as an expert on AFFF contamination within the public water supply (Plaintiff).
- Laguna Beach, CA. Retained as an expert on the water, including irrigation and construction moisture issues. Declaration, Mediation (Plaintiff, Woods Cove v Michael Liikala, Case No. 20-5685-DRC).

- Santa Barbara County, CA. Retained as an expert on hydrogeology and water resource sustainability. Expert Report and Deposition (Plaintiff, Goleta Water District v Slippery Rock Ranch, LLC, Case No. 1487005).
- Pleasanton, CA. Retained as an expert in dry-cleaning operations and PCE/TCE contamination (Defense, Charles H Stoll v Timothy Ewing, et al., Case No. 3:17-cv-02226-JSC).
- Los Angeles County, CA. Cogswell Dam Review and Development of Dewatering Program.
- Santa Barbara, CA. Hydrogeological Evaluation for a Potential Cannabis Project.
- Vista, CA. Retained as an expert on wetlands and surface water flow (Defense, <u>Goebel v City of</u> Vista and State of California, et al., Case No. 37-2018-00058162-CU-PO-NC).
- Lake Elsinore, CA. Retained as an expert on surface water and debris flow (Defense, Gomes, et al., v County of Riverside, et al., Case No. RIC2003297).
- Bell Gardens, CA. Retained as an expert on remediation (Defense, <u>Bell Gardens Avenue, LLC, et al., v 8000 Bell Gardens, LLC, et al., Case No. 20STCV26362</u>).
- Canoga Park, CA. Retained as an expert on the fate, transport, and cleanup of TCE/PCE contamination. Declaration (Plaintiffs, Behar, et al., v Northrup Grumman et al., Case No 21-cv).
- Midwest City, OK. Retained as an expert associated with dry-cleaner operations and potential contamination. Declaration (Plaintiff, Weingarten Realty Investors, et al., v Brite Cleaners, Inc., et al., Case No. 5:18-cv-971-JD).
- Encinitas, CA. Retained as an expert in fluvial geomorphology. Declaration (Defense, <u>Preciado v</u> City of Encinitas, Case No. 37-2020-00037766-CU-EL-CTL).
- Merrimack, NH. Retained to review PFAS/PFOS contamination (Plaintiffs).
- East Chicago, IN. Retained to review and evaluate lead contamination. Expert Report (Plaintiffs, Alvarez, et al., v City of East Chicago et al. Case No. 2:16-cv-00525-PPS-PRC).
- Blades, DE. Retained to review PFAS/PFOS contamination (Plaintiffs).
- San Diego, CO. Retained as an expert in fluvial geomorphology. Declaration and Expert Report (Defense, <u>Lodge v Barbanell</u>, <u>Case No. A265558-58</u>).
- Encinitas, CA. Retained as an expert in fluvial geomorphology. Declaration (Defense, <u>Gilligan v City of Encinitas</u>, Case No. 37-2020-00038879-CU-EI-CTL).

- Inglewood, CA. Retained as an expert in soil contamination. Expert Report (Plaintiff, <u>TKG Management, Inc.</u>, et al., v Chubb Custom Insurance Company, et al., Case No. 2;19-cv-10986-AB-AS).
- Marinette, WI. Retained to review PFAS/PFOS contamination (Plaintiffs).
- Malibu, CA. Hired to review and report on multiple single-family homes' groundwater resources.
- Blythe, CA. Retained as an expert in surface water hydrology and canal flow (Plaintiff, <u>Presley v</u> Palo Verde Irrigation District).
- Hesperia, CA. Hired to review City water resources.
- Torrance, CA. Hired to develop a Conceptual Site Model for a former manufacturing facility.
- Michigan. Retained as an expert on the dam failure and resulting flooding (Plaintiffs).
- Los Angeles, CA. Retained as an expert in environmental consulting. Mediation (Defense, Madrone et al., v Odic Environmental, Case No. 19STCV27986).
- Central CA. Retained as an expert in hydrogeology and water resources.

- Orange County, CA. Hired to evaluate multiple historical dry-cleaning operations, including developing remedial options for cleanup.
- Chula Vista, CA. Retained as an expert associated with hydrology issues (Defense, <u>Ludwig v. City</u> of Chula Vista, Case No. 37-2019-00034737-CU-EI-CTL).
- Laguna Niguel, CA. Hired to evaluate groundwater conditions associated with a landslide.

- Newport Beach, CA. Hired to evaluate the risk posed by contaminated soil, soil vapor, and groundwater in the residential neighborhoods.
- Los Angeles, CA. Hired to evaluate the contaminated soil conditions along a freeway expansion.
- San Diego, CA. Hired to evaluate the hydrogeological conditions of the Mission Valley Project.
- Santa Barbara, CA. Retained as an expert associated with dry-cleaner operations and potential contamination. Expert Reports (Defense, <u>Donald George</u>, et al., v <u>L&R Dry Cleaning</u>, <u>Case No.</u> 5:14-cv-01872-DSF(SHx).
- Apple Valley, CA. Retained as an expert on hydrogeology and water resources (Plaintiffs).
- Cannonsville, NY. Retained as an expert on hydrogeology associated with an earthen dam. Expert Reports (Plaintiff, City of New York v Gomez et al., Index No. 451296/2018).
- Santa Paula, CA. Retained as an expert on hydrometeorological conditions related to the Montecito-Thomas Fire (Defense).
- La Jolla, CA. Retained as an expert associated with the flooding of a single-family residence (Plaintiff).
- Rancho Palos Verdes, CA. Hired to conduct a site assessment, remedial investigation, and work plan.

- Bethpage, Long Island, NY. Retained as an expert associated with groundwater and soil gas contamination. Expert Report and Deposition (Plaintiff, Romano, et al., v Northrop Grumman et al., Case No. 16-cv-5760).
- San Bernardino County, CA. Hired to conduct a Phase 1 and hydrogeological assessment.
- Glen Ivy, CA. Retained as an expert associated with flood damages. (Defense, Glen Ivy Investments Inc., et al., v Shea Homes, Inc., et al., Case No: RIC 1313300).
- Norwalk, CA. Hired to develop CSM and work plan to evaluate historical gas and dry-cleaning facility.
- Merced, CA. Retained as an expert on hydrogeology, groundwater seepage, and surface water. Deposition (Plaintiff, Thorp, et al., v Merced Irrigation District et al.).
- Portland, OR. Retained as an expert associated with a landslide (Defense).
- Los Osos, CA. Hired to develop an RAP associated with BTEX contamination.
- Newberry Springs, CA. Hired to evaluate water budget and any shortcomings in the Mojave Judgement. Letter Reports and Multiple Declaration (Plaintiff, <u>City of Barstow, et al., v City of</u> Adelanto, et al., <u>Case No: CIV 208568</u>).
- New Mexico. Retained as an expert associated with field drilling operations and well design.
   Declaration (Defense).
- Houston, TX. Retained as an expert associated with flood damages from Hurricane Harvey (hydrology and meteorology) (Plaintiffs).
- Huntington Beach, CA. Retained as an expert on PCE contamination, fate, and transport associated
  with a dry-cleaner. Deposition (Defense, <u>Chan Property v Misak Olgun et al.</u>, <u>Case No 30-2018-</u>
  00984600-CU-PO-CJC).
- Torrance, CA. Retained as an expert on the fate and transport of contamination emanating from refinery operations. Declaration and Deposition (Plaintiff, Goldstein v Exxon Mobil, et al., Case No 2:17-cv-02477-DSF (SKx)).
- Malibu, CA. Hired to assess potential single-residence groundwater well.

- Los Angeles, CA. Hired to perform Phase II site assessment at former dry-cleaners.
- Santa Barbara, CA. Retained as an expert on PCE contamination, fate, and transport (Plaintiff).
- Whittier, CA. Hired to review Phase II associated with both residential and commercial property.

- San Diego, CA. Retained as an expert in hydrology and meteorology (Defense, <u>Anderson</u>, et al., v Cortez et al., Case No 37-2016-00004134-CU-BC-CTL).
- Roxboro and Mayo, NC. Retained as an expert in hydrology, hydrogeology, and geology. Expert
  Reports and Deposition (Defense, <u>Roanoke River Basin Association v Duke Energy Progress, LLC,</u>
  Case No 1:16-cv-607 and No 1:17-cv-452).
- Inglewood, CA. Retained to review soil contaminated with arsenic and potential sources (Plaintiff).
- Torrance, CA. Hired to review the refinery's soil, water, and soil gas contaminant history.
- Bakersfield, CA. Hired to review water quality on the bottled water plant.
- Santa Barbara, CA. Hired to review contaminant history of former dry-cleaner facility.
- Glendale, CA. Hired to perform background research on dry-cleaner facility.
- San Jose, CA. Hired to perform Phase II site investigation.
- Bishop, CA. Retained as an expert on hydrology and hydrogeology concerning the Round Fire (Defense).
- Thousand Palms, CA. Retained as an expert in hydrology and geomorphology (Defense, <u>Hernandez</u> v Huth, et al., Case No PSC 1501365).
- Beverly Shores, IN. Retained as an expert on well drilling, abandonment, and geothermal wells.
   Expert Report and Deposition (Defense, <u>Salomon</u>, et al., v <u>Mark Scott Construction</u>, et al., <u>Case</u> No 2:15-cv-464).
- Moraga, CA. Hired to review Phase II Soil Vapor Site Investigation.
- Long Beach, CA, Hired to review Phase II soil and soil vapor site investigation.
- Huntington Beach, CA. Retained as an expert on PCE fate and transport. Deposition (Defense, 17892 Jamestown, et al., v Goldenwest Laundry, et al., Case No. 30-2014-00705041-CU-NP-CJC).
- City of Industry, CA. Hired to determine dewatering options, calculate volumes, and review disposal options.
- Lafayette, CA. Hired to review Soil and Groundwater Management Plan.

### 2016

- San Jose, CA. Hired to review and perform site investigation in association with PCE.
- Los Angeles, CA. Hired to develop soil and groundwater sampling plans for CalTrans.
- Malibu, CA. Hired to review groundwater withdrawal impacts on a local stream.
- Malibu, CA. Hired to develop and survey several groundwater monitoring wells.
- Malibu, CA. Hired to oversee pilot drill holes for City water injection program.
- Anaheim, CA. Hired to review RI/FS of a former dry-cleaning facility.
- Santa Barbra, CA. Retained as an expert on PCE contamination fate and transport. Expert Report, Rebuttal Report, and Deposition (Defense, <u>Goldberg</u>, et al., v <u>Goss-Jewett Company</u>, et al., <u>Case</u> No. EDCV 14-1872DSF).
  - Malibu, CA. Hired to install several monitoring wells and rehabilitate an existing well.

- Denver, CO. Retained as an expert on water wells and hydraulic fracturing. Expert Report, Rebuttal Report, and Deposition (Defense, <u>Hydro v Denver Southeast Suburban Water</u>, and <u>Sanitation District et al.</u>, Case No. 201CV30849).
- Orange County, CA. Retained as an expert on groundwater. Deposition (Defense, <u>Kirk</u>, et al., v Varco, et al., Case No. 30-2010-00423097).
- Orange County, CA. Hired to review the South Coast Water District Desalination Program, specifically the slant intake wells.

- Malibu, CA. Hired to oversee groundwater issues associated with a landslide.
- Malibu, CA. Hired to install several groundwater monitoring wells in association with WDR permit.
- Los Angeles County, CA. Retained to provide expert testimony regarding well abandonment (Defense, Golden State Water Company v. General Pump, et al.).
- Los Angeles County, CA. Retained to provide expert geology and hydrogeology testimony (Defense, C. Donald Albin, et al., v David Leu, et al., County of Los Angeles, Case No. TC027060).
- Los Angeles County, CA. EIR review and comments for wastewater plant and disposal.

- Northern California. Phase II Site Investigation.
- Los Angeles County, CA. Retained to provide expert rebuttal testimony on regional hydrogeology.
   Expert Rebuttal Report (Defense, <u>City of Cerritos et al., v Water Replenishment District of Southern California, Case No. BS128136</u>).
- Los Angeles, CA. Hired to collect samples of both seepage water and treated effluent waters.
- Loma Linda, CA. Retained to provide expert opinion on meteorological analysis (Plaintiff, <u>SoCal Self-Storage Loma Linda v City of Loma Linda</u>, et al., <u>Case No. CIVDS 1200111)</u>.
- Los Angeles, CA. Hired to review multiple potentially responsible parties' case files for the Los Angeles Department of Power and Water (Plaintiffs).
- Malibu, CA. Hired to abandon multiple groundwater monitoring wells.

### 2013

- San Diego, CA. Retained to provide expert testimony on surface water hydrology, geomorphology, and meteorological analysis (Defense, <u>Jaffe v Bradshaw</u>, et al., <u>Case No. 37-2011-00055925-CU-PO-NC</u>).
- Lancaster, CA. Hired to peer-review a groundwater model and subsidence issues.
- Malibu, CA. Hired to review wastewater treatment options.
- Malibu, CA. Hired to review and reply to EIR comments about wastewater discharge and hydrology, hydrogeology, and geology.
- Olivenhain Municipal Water District. Hired to evaluate groundwater resources. Conceptual Water Resource Evaluation.

- Torrance, CA. Retained to provide expert testimony on groundwater seepage (Defense, <u>Torrance Matrix Center Property Owners Association v. Headlands Realty Corporation</u>, et al., <u>Case No. BC462023</u>).
- Duncan, OK. Retained to provide expert testimony on the fate and transport of perchlorate and other contaminants of concern, geology, and hydrogeology. Expert Reports, Depositions, and Mediation Conferences (Plaintiff, <u>Alexander</u>, et al., v. <u>Halliburton Company</u>, et al., <u>Case No. 5:11-cv-01343-M</u>).
- North Central Texas. Hired to evaluate the possible causation of potable water well failures.
- San Francisco, CA. Conducted evaluation of contaminated soils for CalTrans.
- Malibu, CA. Hired to conduct groundwater investigation and model of wastewater discharge into the subsurface. Includes the evaluation of ASR wells and groundwater-sea water interaction. Includes developing groundwater and surface water sampling protocols for long-term monitoring.
- Malibu, CA. Hired to conduct groundwater investigation for wastewater treatment system upgrade on a single-family residence.
- Fennville, MI. Retained to provide expert testimony on the fate and transport of contaminants of concern, geology, and hydrogeology. Expert Report and Deposition (Plaintiff, <u>Barnes</u>, et.al., v <u>Birds Eye Foods</u>, Case No. 1:10-cv-541).
- San Nicolas Island, CA. Hired to develop a white paper on the feasibility of deep-well brine injection.

- Long Beach, CA. Hired to develop calculations of dewatering operations for the Gerald Desmond Bridge Replacement Project.
- Malibu, CA. Hired to conduct quarterly and annual groundwater and effluent sampling of commercial property.

- Orange County, CA. Retained to provide expert testimony on hydrogeology, TCE/PCE, perchlorate
  contaminant sources, and remediation. Deposition (Defense, <u>Orange County Water District v Sabic</u>
  Innovative Plastics, Case No. 30-2008-00078246-CU-TT-CXC).
- Parker Dam, CA, Semi-Annual Groundwater Reporting to Bureau of Land Management.
- Baldwin Park, CA. Hired to oversee soil and groundwater sampling for CalTrans freeway expansion in association with FlatIron Corp., including both environmental and geotechnical sampling.
- Pomona, CA. Retained as a rebuttal expert to provide opinions on hydrogeology, contaminant sources (perchlorate), and historical fertilizer use. Expert Rebuttal Report and Trial Testimony (Defense, City of Pomona v. SQM North America Corporation, Federal Court).
- Malibu, CA. Retained and hired to evaluate groundwater conditions of a landslide area in association with geotechnical mitigation. This included overseeing groundwater monitoring, drilling of monitoring wells, and meteorological assessment. Included Mediation (Defense).
- Laguna Beach, CA. Hired to photo-document coastal cave collapse.
- Baldwin Park, CA. Hired to evaluate the soil contamination of several stockpiles associated with FlatIron Corp. for road construction.
- Malibu, CA. Hired to evaluate and construct artificial recharge wells associated with the City wastewater system. This included drilling test wells, aquifer testing, and water chemistry.
- San Jose, CA. Aided in the development of a construction proposal for FlatIron Corp.
- Riverside County, CA. Reviewed ADL reports for SEMA Construction Corp.
- Los Angeles County, CA. Provided Hydrogeologic evaluation of the landslide-impacted area.
- City of Los Angeles and Riverside County, CA. Wrote ADL Reports for CalTrans.

- Fullerton, CA. Retained to provide expert testimony on contamination sources and remedial alternatives (Plaintiff, M&H Realty Partners v Aerojet-General Corp et al., CA State Court).
- Carson, CA. Provided review of contaminated soil data and sampling plan for hydrocarbon investigation.
- Fresno, CA. Wastewater sampling at National Raisin Plant. Provide consulting services on wastewater reuse.
- Pleasant Hill, CA. Retained to provide expert assessment of BTEX/MTBE (Declaration (Plaintiff)).
- Victorville, CA, Hired to provide background information on Desert Knolls Wash.
- Placer County, CA. Retained to provide a hydrogeological assessment of the production well and its impact on neighboring domestic wells on behalf of plaintiffs.
- Merced, CA. Retained as designated expert for Chromium VI contamination case. Work included providing hydrogeological analysis and guidance. Declarations, Expert Reports, Deposition, and Trial Testimony (Plaintiff, <u>Abarca</u>, et al., v. <u>Merck-Federal Court</u>).

### 1995 - 2010. Environmental Science & Planning, LLC. Partner (Owner Operator).

Project experience includes management, expert testimony, fieldwork, bid preparation, and consulting for public agencies and private companies in remediation, water resource evaluations, geophysical investigations, surface water management, sampling, and modeling. Selected consulting projects as follows:

### 2008

- Torrance, CA. Provided expert analysis of dry-cleaner facility for commercial property.
- Long Beach, CA. Aided in developing a conceptual model of a manufacturing facility.
- Provide technical oversight and alternatives for San Bernardino County Flood Control.
- Orange County, CA. Retained as a designated expert on a single-family home associated with potential water issues (Defense).
- San Bernardino County, CA. Provided consulting services concerning the water supply to an area
  of single-family residences.
- Signal Hill, CA. Provided expert analysis of downhole video of the suspected drain.

### 2007

- La Jolla, CA. Retained as a designated expert on surface and groundwater issues related to landslide (Plaintiff).
- Long Beach, CA. Retained as a designated expert on surface and groundwater issues surrounding a coastal condominium complex (Plaintiff).
- Norco, CA. Provide expert oversight to Wildermuth Environmental, Inc., on surface water and groundwater sampling protocols and training.

### 2006

- Riverside, CA. Environmental Impact Report. Provided technical support on land development associated with an old mining claim.
- Irvine, CA. Environmental Engineering and Contracting. Provided support and review of CPT, ROST data for an environmental contamination project in Illinois.

### 2005

- Malibu, CA. Retained as a designated expert on the hydrogeologic analysis of existing wastewater systems. Included Deposition (Defense).
- Riverside, CA. Oversaw specialized soil and groundwater sampling for Layne Christenson.

### 2004

- Oakland, CA. Soil and groundwater sampling for CalTrans.
- California. Statistical analysis of lead in soil samples for CalTrans highway expansion.
- Carpinteria, CA. Retained as a wetland expert, including HEC-RAS modeling.

### 2002

Playa Vista, CA. Developed methane mitigation plan for residential and commercial development.
 This included testifying before the County Commissioners.

### 1999 - 2000

- Norco, CA. Oversaw development of methane sampling and mitigation standards for Riverside, California.
- Norco/Corona, CA. Methane Mitigation Investigation.
- Long Beach, CA. Conducted both soil and groundwater sampling for Carlin Environmental Consulting.

- 1998 2001 & 2007 2012. Earth Consultants International, Inc. Senior Consultant (www.earthconsultants.com) Work includes project management and hydrogeologist duties. Other activities include business development and marketing. Projects include wastewater, oil field seepage, methane mitigation, dewatering for construction purposes, EIR development, water resources investigations, watershed studies, and a regional groundwater GIS study for Riverside County.

  2010
  - Ocotillo/Coyote Wells, CA. Retained to review groundwater basin conditions in association with Wind Zero development (Testimony on behalf of Client – Imperial County).

### 1998 - Present: City of Malibu Specific Projects

- Hired to provide hydrogeologic services in association with a zero-discharge wastewater system. Aided in Salt Management Plan.
- Hired to provide hydrogeologic services associated with on-site wastewater, Miramar Investment Co.
- Retained to provide consulting services associated with wastewater discharge impacts to the subsurface at Malibu Racquet Club, Casa Malibu Inn, Wavebreak Restaurant, and Malibu Cantina Restaurant (<u>Testimony on behalf of Client – LARWQCB</u>).
- Retained by the City of Malibu to represent them in a surface water lawsuit (Defense).
- Oceanographic-Hydrogeological analysis and modeling of tidal fluctuations, storm surge, and impacts to a coastal developments wastewater discharge system.
- Conducted a regional groundwater study for the City of Malibu associated with a groundwater flow model of the downtown area. This includes fieldwork, data analysis, and modeling support (Testimony for Client – LARWQCB).
- Provided expert testimony for the City of Malibu on local groundwater conditions (<u>Testimony</u> on behalf of Client LARWQCB).
- Hydrogeological Characterization and modeling of subsurface wastewater discharge (mounding) Crummer Property, Malibu, California.
- Hydrogeological Characterization and modeling of subsurface wastewater discharge (mounding) – Winter Canyon, Malibu, California.
- Hydrogeologic Characterization and testimony to wastewater discharge to subsurface –
   Malibu, California. (Testimony on behalf of Client LARWQCB)
- Hydrogeologic Characterization and Assessment of Impacts of Wastewater Discharge for proposed wastewater treatment facility in downtown Malibu (<u>Testimony on behalf of Client</u> – LARWOCB).
- Hydrogeologic Characterization and Assessment of Wastewater Discharge Impacts for Thirteen Single-Family Residences' Proposed Construction in Trancas Canyon, Malibu, California.
- Groundwater study of Winter Canyon, Malibu, California, to determine the feasibility of using the canyon for wastewater disposal.
- Groundwater study of 200 acres in preparation for the Malibu Civic Center EIR.
- Provide expert witness testimony on sewer seepage and geology for the City of Malibu (Testimony on City of Malibu – LARWQB).

### 2001

Developed Safety Elements for Newport Beach, Brea, Glendale, and Pasadena.

### 2000

Los Angeles, CA. Playa Vista Corporation – Groundwater and Methane Migration Investigation on Playa Vista Property (Testimony for Client – City of Los Angeles).

### 1999

Safety Element of the General Plan, Riverside County.

- Orange, CA. Environmental Impact Report Geologic, Seismic, and Hydrologic Sections of the Environmental Impact Report for the Proposed Sully-Miller Fieldstone Project.
- Brea, CA. Feasibility investigation to review mitigation options for active crude oil seeps (tar) and methane generation.

### 2001-2007. Hromadka & Associates. Consultant

Provided litigation support, computer and physical modeling, expert report reviews, writing, and managing multiple cases and field-site inspections for the company.

### 2006

- San Diego, CA. PCB transport in San Diego Bay.
- San Francisco, CA. Physical model of apartment complex combined sewer and storm drain network.
- San Francisco, CA. Severe rainfall analysis for four storm events, flooding.

### 2005

- Yorba Linda, CA. Analysis of sediment transport from large grading project and nursery debris production at a school site.
- Irvine, CA. Groundwater uplift analysis of clogged filter fabric in the flexible lining and sediment transport in San Diego Creek in a 2-mile reach using flexible block lining.
- Torrance, CA. Sediment transport in Compton Creek downstream of Montrose Plant. Transport analysis of sediment in major/minor events.
- Development of Volume-based BMP design procedure for San Bernardino County WQMP.
- Multi-lake hydrologic and water quality analysis at Lake Merced, California. Phosphates, nitrates, golf courses, coliform in groundwater, flood control, and risk reduction. Tunnel flow capacity analysis. Hydrologic balance analysis.
- Santa Rosa, CA. Transport and fate of TCE, PCE in surface water.
- Anaheim Hill, CA. Soil water transport and ET studies for several hundred residences. Water balance studies.
- Fullerton, CA. Soil water transport and ET studies for several dozen residences. Soil water flux in concrete.
- San Clemente, CA. Soil water transport and hydrologic balance analysis near landslides.
- Castaic Lake, CA. Soil water transport and hydrologic balance analysis of residential tract.
- Oahu, HI. Groundwater plume transport, analysis of BTEX in rising groundwater and tidal effects.
- Daly City and San Francisco, CA. Flooding and tunnel capacity analysis.

### 2004

- Tehachapi, CA. Analysis of TDS, cement Kiln dust, chlorinated hydrocarbons, BTEX, TCA, TCE, DCA, and DCE, groundwater flow in fractured and faulted media.
- Irvine, CA. Groundwater hydrostatic pressure analysis, waterproofing of office center.
- Laguna Canyon, CA. Modeled Landslide.
- Fullerton, CA. Sediment and Debris production, transport, 50-acre watershed.
- Palm Springs, CA. Transport of Aeolian Sand, PM10, saltation, creep, and entrainment in the "Blow Sand" area.
- Water Quality holding time criteria development, 85 percent of average storm analysis, County of San Bernardino, Water Resources Division.

- Torrance, CA. Sediment transport analysis between the city of Torrance and Santa Monica Bay.
   DDT transport.
- Analysis of TDS, viruses, bacteria, and raw sewage in New River and Salton Sea. Evaporation
  impacts to Salton Sea salinity.
- San Clemente, CA. Analysis of landslide development.

- Henderson, NV. Analysis of soil water excess. Perchlorate sampling and analysis
- Review of perchlorate modeling and transport, Mid-Valley Landfill, San Bernardino County, California.
- Groundwater supply and TDS inflow levels into New River and Salton Sea, Imperial Valley, California.
- Henderson, NV. Man-made preferential pathways and groundwater transport in land development.
- Anaheim Hills, CA. Water Supply, soil water saturation, landscape methodology review, moisture accumulation, and percolation tests.
- San Diego, CA. Analysis of releases, BTEX, MTBE, lead, groundwater flow, plume evolution, soil gas, soil TPH, CPT/LIF, HydroPunch data at Mission Valley.

- Honolulu, HI. Sediment transport and erosion.
- · Las Vegas, NV. Debris and sediment flow in Duck Creek.
- Irvine, CA. Statistical analysis of all Orange County sediment and contaminant data, San Diego Creek watershed.
- Ontario, CA. Groundwater modeling and analysis of Kaiser TDS plume.
- San Clemente, CA. Analysis of landslide hydrologic balance.

#### 2001

- Irvine, CA. Stability of erosion control measures in San Diego Creek.
- Dana Point, CA. Erosion analysis of slope failures.
- Torrance, CA. Transport of DDT in surface water, groundwater, sediment, and atmosphere, M2000 transport of DDT from a chemical plant.
- San Diego, CA. Groundwater transport of fuel, free-product, in Mission Valley.

#### 1996 - 1998, SimulProbe Technologies. Senior Hydrogeologist

Traveled extensively throughout North America and Europe, marketing various technologies. Promoted to head of marketing in the Midwest and Southwest regions. Responsibilities included budgeting, supervising staff, project management, and presenting to government officials and private contractors. My duties also included direct marketing to drilling firms and environmental consultants, supervising all sales personnel and marketing efforts, scheduling service calls and field operations, and assisting with R&D, field training, and site management.

#### Miscellaneous Projects

#### 1995 - 1998, Project/Staff Geologist

- Kalamazoo, MI. Worked with United Environmental Technologies, Inc. to help develop sampling and well-construction protocols for various projects.
- Kalamazoo, MI. I worked for the GEM Regional Center at Western Michigan University. Conducted water budget analysis for watershed located in Calhoun County.
- Kalamazoo, MI. Worked with the *Health Division of the Michigan Department of Environmental Quality* on well-grouting issues surrounding public and private water supplies.
- Kalamazoo, MI. I worked with the Michigan Department of Environmental Quality on the hydrogeological and geochemical aspects of the Panelyte site. This involved the use of geophysics and geochemical analysis for the detection and mapping of possible contaminants.
- Ross Township, MI. Retained through Western Michigan University by the City of Kalamazoo to
  determine the impact of a proposed wellfield on the surrounding surface water bodies (streams,
  lakes, and wetlands).

#### 1993 - 1995

- Minden, MI. Retained by *Michigan Peat Company* to evaluate peat reserves. The evaluation involved sampling and mapping the peat reserves for litigation.
- Salem, IL. Retained by *Hi-Shots Aerial Photography Inc.*, to setup and demonstrate internet capabilities for small businesses.
- Michigan. Retained by Superior Environmental Corp. to conduct EM-31 geophysical surveys. The surveys were designed to locate possible buried tanks in a downtown bank parking lot, a corner restaurant parking lot, fabrication/manufacturing buildings, and a former car dealership.
- Schoolcraft, MI. *Alpha GeoSciences Inc.* (Through Department of Geology, Western Michigan University). Hired to run a hollow stem auger drill rig. Three 30-foot wells were installed.
- Kalamazoo, MI. Golder Associates Inc. (through the Institute for Water Sciences, Western Michigan University) retained geophysical log monitoring wells within the KL-landfill CERCLA site using natural gamma radiation.
- Champaign/Urbana, IL. Conducted an aerial photographic survey of the Champaign/Urbana landfills to locate hot spots where possible sub-surface fires may be burning. The contract was funded through the *Illinois State Geological Survey*.
- Ann Arbor, MI. Conducted aerial photographic survey of a contaminated wetland for Alpha GeoSciences Inc. of Kalamazoo, Michigan. Provided site maps of monitoring wells and sampling locations.

#### 1991 - 1993

- Sanibel Island, FL. Retained by the *City of Sanibel Island*, *Florida*, to evaluate coastal erosion along the Gulf Coast side of the island for litigation.
- Paris, France. Retained by Littoral et Patrimoine for projects in France and India. Evaluated coastal
  erosion and constructed possible solutions to ongoing erosion problems.
- Sandusky, OH. Designed a sediment coring program along the Sandusky River and part of Lake
  Erie for a project funded by the Ohio Department of Natural Resources. The sediment cores were
  used to define the sediment input from the Sandusky River and Lake Erie on adjacent
  estuaries/marshes.
- Three Rivers, MI. Retained by *Reid and Reid Law Offices*, Kalamazoo, Michigan, to evaluate the effects of the construction of a golf course and adjacent buildings on the water quality of Lake Templene for litigation.
- Portage, MI. Designed and coordinated the work on an aeration pilot project on Austin Lake. This
  project involved bottom sampling, coring, and sediment profiling. Collected and analyzed the
  sediment and water samples for the Ramco Company. Prepared an independent report on the
  success of the entire project.
- Ludington, MI. Assisted on the Department of Geology's state-funded project involving erosion control monitoring of Undercurrent Stabilization systems.
- Michigan. Assisted the Western Michigan University Department of Geology on a state-funded project regarding erosion monitoring along Lakes Michigan and Huron.
- Wilmington, NC, and Plainwell, MI. Retained by Dr. Thomas Straw to analyze various meteorological parameters for a host of hydrology projects.
- Plainwell, MI. Retained by Dr. Thomas Straw to solve problems associated with a gravel pit operation.

#### 1990 - 1991

Atlanta, GA. Retained as a consultant by Sutherland, Asbill & Brennan, to address a wetland
problem within one of Mobil Land Development Company's major developments. This included
wetland hydrology, soil chemistry monitoring, and aerial photographic interpretation. Litigation
support.

- Benton Harbor, MI. Member of Scientific Party Great Lakes Mapping cruise of eastern Lake Michigan (United States Geological Survey cruise no. NPTN91-1). The resultant sediment samples were split between WMU and the USGS, allowing for research on Fourier shape analysis to possibly fingerprint sediment origin.
- Western Michigan University, Institute for Water Sciences. Research assistant on a USGS-funded project along the Lake Michigan shoreline.

#### 1989 - 1990

• Western Michigan University. Worked with the Department of Geology on small construction projects and consulted on a State of Michigan-funded project addressing shoreline erosion.

#### 1983 - 1989

• Hutchinson, MN. 3M Company. Summer Intern - I worked at various jobs for the 3M Company, including being a heavy equipment operator, plastic injection molding, and VHS line operator.

#### TEACHING EXPERIENCE

2024 - Present California State University, Fullerton, CA

Professor of Hydrogeology. Responsible for teaching lower division classes in Hydrogeology (GEOL 436); Physical Geology (GEOL 101-GE); Water Crisis in California (GEOL 310T): Sedimentology and Stratigraphy (GEOL 321); Hydrology and Surface Processes (GEOL 335); Meteorology (GEOL 340-GE); Oceanography (GEOL 333-GE); Physical Geology (GEOL 101-GE) and Lab (GEOL 101L-GE); Field Camp (GEOL 481) and upper division classes in Groundwater Modeling; Environmental Sampling and Protocols; Well Hydraulics and Aquifer Analysis (GEOL 535T); Research Methods in Geology (501); Geology Seminar (GEOL 590).

2006 - 2024 California State University, Fullerton, CA

Associate Professor of Hydrogeology.

2015 -2026 Western Michigan University, Kalamazoo, MI.

Adjunct Associate Professor, Department of Geological and Environmental Sciences.

2000 - 2006 California State University, Fullerton, CA

Assistant Professor of Hydrogeology.

2001 – 2016, 2023-2024 Western Michigan University, Kalamazoo, MI

Responsible for Summer Field Course in Hydrogeology. Teach at least 1-week graduate-level field course(s) every year, including (1) Principles of Well Drilling and Installation; (2) Principles and Practices of Aquifer Testing; (3) Remediation Design and Implementation

1999 – 2000 California State University, Fullerton, CA

Part-time instructor. Responsible for Oceanography (GEOL 333) and Water Quality (GEOL 437).

1992 – 1996 Western Michigan University, Kalamazoo, MI

Graduate Student Instructor responsible for Hydrogeology (GEOL 435), Oceanography (GEOL 333), and Hydrogeology Summer Field Course (GEOL 535 a, b, c, d, e, and f). This field course consisted of six individual modules (40-Hour HAZWOPPER, Environmental Surface Geophysics, Principles of Well Drilling and Installation, Principles and Practices of Ground-Water Sampling and Monitoring, Principles and Practices of Aquifer Testing and Analysis, and Remediation Design and Implication). Other responsibilities included construction measurements and layouts for the Department of Engineering Technology. Responsible for the lab sequences only.

#### Other Teaching Experience

- 2021-23 Instructor Gregg Drilling Field Day
- 2021 Instructor California Public Water Supply Systems
- 2018 Instructor CalGeo Soil Logging and Litigation
- 2016-17 Instructor SCGS Soil Sampling and Classification Short-Course
- 2012 Instructor NGWA Hydrogeology Field Methods Course: What you didn't learn in School. Andover, MN.
- 2010-11 Reviewer/Participant Worked with Healthy Heroes, LLC developing educational videos.
- 1996 98 Instructor Eight-hour OSHA HAZWOPER supervisor course (29 CFR 1910.120 (e)(3).
- Hi-Shots International Conference. Taught short courses on environmental remote sensing utilizing a helium-filled tethered blimp.
- 1992 Kalamazoo, Michigan. Teaching Assistant for a course titled Shoreline Geology and Processes. Course sponsored by the Secondary Education of Michigan Summer (SEMS). This was a state-funded project.
- St. Joseph, Michigan, Berrien County. Teaching assistant for a Shoreline Geology and Processes course sponsored by the SEMS State-funded project.

#### **Developed CSUF-Departmental Short-Courses:**

- CPT Demonstration Day Gregg Drilling (2010)
- AMS Demonstration Day (2009)
- GeoProbe Demonstration Days (2009 2011, 2017)
- Westbay Multiport Sampling (2004-09, 2017)
- CPT Field Demonstration on Quality Environmental Site Investigation. (In-cooperation with Gregg Drilling) (2004)
- Environmental Sampling Procedures and Practices (2003)
- Borehole and Well Logging Interpretation (Taught at Layne Christenson) (2003)
- Baroid Industrial Drilling Products Drilling and Boring Fluids (2002)
- GIS Course I & II What is GIS and how can it be utilized in research (2001)
- FEMA Advanced HAZUS Training for GIS Professionals (2001)

#### TEACHING PHILOSOPHY

As a professor, I aim to provide students with practical experience essential for building a successful career. In addition to providing the "nuts and bolts" of a subject, I encourage students to apply traditional knowledge to innovative approaches through applied research and hands-on experience. I aspire to motivate students by fostering participation in unique learning opportunities, many of which are provided by local companies, agencies, and vendors willing to share their services and expertise.

Through private and government grants and contracts, I can provide multiple funding opportunities to my students, allowing them the means to spend more time on their academic studies and providing experience through field-related projects. My main research focus is groundwater hydrology and hydrogeology of arid environments. Most of my students directly participate in this research and can obtain either Bachelors' or Masters' degrees through individual projects for which they are responsible.

I encourage my students to actively participate in professional organizations to build strategic partnerships and create a broad-reaching network of individuals and indispensable resources. Further, I encourage students to present abstracts and posters at local and national conferences and to publish their research as much as possible to stimulate educated discussions with their peers and accomplished professionals.

The best way to measure the effectiveness of my objectives and judge my goals is to elicit student feedback and evaluation. My students consistently rate me very high in their end-of-semester assessments. My biggest reward as a teacher is a lasting professional and personal relationship with my students. I enjoy working with and supporting students through their academic careers and feel honored when they graduate with a professional degree.

#### AWARDS, HONORS, SPECIAL QUALIFICATIONS

- NGWA 2024 Fellow Designation
- NGWA 2024 Robert Storm Intersectional Cooperation Award
- NGWA 2014 Ross L. Oliver Award
- NGWA 2014 Keith E. Anderson Award
- Western Michigan University 2011 Distinguished Alumni Award
- NGWA 2009 McEllhiney Lecturer for Water Well Technology
- International Ground Source Heat Pump Association (IGSHPA) Accredited Trainer (20589-0709)
- Boy Scouts of America Merit Badge Sponsor: Geology, Oceanography, Environmental Science, and Soil and Water Conservation
- CSUF Student Association, Outstanding Academic Advisor (2003/04)
- CSUF NSM Nominee for Outstanding Contributions to Student Success Award (2002/03 & 2003/04)
- Western Michigan University established a scholarship in my honor for the outstanding hydrology field camp students. Awarded annually since 1998.
- Western Michigan University, Department of Geology, Distinguished Service Award, 1997
- Western Michigan University Research Fellowship 1991-1992
- IEEE OCEANS 92' student paper finalist
- OSHA 40-Hour Hazwoper Supervisor, Active

#### NATIONAL AND UNIVERSITY COMMITTEES

- CSUF, Hiring Committee for VP Government and Community Relations (2020)
- CSUF, Campaign Congress, 2020-present
- CSUF, Strategic Planning Committee Member, 2019-2022
- CSUF, Hiring Committee for VP Advancement (2018)
- CSUF, University Advancement Committee Member, 2003-05; 2011-15; 2017-21 (chair 2017-20)
- CSUF, Freshman Pathways (Sustainability), Committee Member, 2013-2015
- CSUF, ENST Advisory Committee, 2004 present
- WMU, Geosciences Advisory Council Member 2007 present (Chair 2021-)
- GRAC Educational Committee Member 2009 present
- NWRI Independent Advisory Panel; OCWD Santa Ana River Monitoring Program, 2006-2012
- Long Valley Hydrologic Advisory Committee, 2003-2009

#### NATIONAL GROUND WATER ASSOCIATION

- NGWA Research and Education Foundation, President, 2015-2017
- NGWA Research and Education Foundation, Board Member, 2010-2014, 2017-2018
- Scientists and Engineers Division, Past Chair 2012-2014
- Scientists and Engineers Division, Chair 2010-2012
- Scientists and Engineers Division, Vice-Chair, 2008-2010
- Scientists and Engineers Division, Board Member, 2004-2008; 2016-2020
- NGWA McEllhiney Lecture Committee, 2014 2018 (chair 2014); 2019 2021
- NGWA Board of Directors, 2008-2014
- NGWA Professional Development Committee Member, 2000 (chair 2009-2010)
- NGWA Groundwater Summit Co-Chair (2006): Committee Member (2005, 2007-2012)

## FUNDED GRANTS and CONTRACTS (CSUF total to date through 2024: over \$ 3,000,000)

#### 2016-2020

California High Speed Rail Authority (\$500,000); Oversee Groundwater issues as they may pertain
to construction and operations of the California High Speed Rail. Including groundwater modeling
review and deep groundwater monitoring.

#### 2004 - 2014

Mojave Water Agency (\$2,099,000); Grant for work on Water Resource Evaluation and Mapping

 Mojave Desert Region (Alto, Este, Oeste, and Centro Hydrologic Sub-areas).

#### 2003

- Mojave Water Agency (\$217,000); Water Resource Research within the Mojave Desert. Part of
  this project is to develop a GIS/Database inventory of all wells, groundwater elevations, and
  hydrogeochemistry of each basin within the boundaries of MWA. Specific portions of the grant
  were set aside to oversee, collect, and analyze data from a 2,500-foot-deep multiport monitoring
  well near Oro Grande Wash.
- Friends of the San Gabriel River (\$32,000); Citizens Monitoring Program Development and Implication. This was funded through a State of California Grant (Prop 50).

#### 2002

- Mojave Water Agency (\$57,405); Groundwater Investigations to look at potential recharge areas
  throughout the Southern Mojave Desert Area. Establish a digital well log inventory and
  bibliographic search of all documents on MWA Water Agency. CSUF also developed a key well
  program for Lucerne Valley based on groundwater basin recharge.
- CSUF Service-Learning Mini-Grant (\$1,500); Integrating Service Learning into Advanced Environmental Geology.
- Earth Consultants International, Inc. (\$3,000); Geologic Interpretation of borehole geophysics. Involves the gamma-ray logging and interpretation of subsurface geology.

#### 2001

- CSUF Service-Learning Mini-Grant (\$3,000); Integrating Service Learning into Advanced Hydrogeology Sampling.
- San Elijo Lagoon Conservancy (\$35,000); Sediment Quality and Depositional Environment of San Elijo Lagoon.
- Los Angeles Regional Water Quality Control Board (\$31,000); The Santa Clara River Watershed;
   GPS and Observational Report on the Santa Clara River
- Grant to develop a web-based model on Distance Calibration of Earth Images (\$800). This was
  part of the Advanced Technology in Science Learning Environments Grant through the Department
  of Biology.
- CSUF Summer Support Assistance (\$5,000): This was summer support money to aid in sampling water and soil throughout Orange County, California.

#### 2000

 Los Angeles Regional Water Quality Control Board (\$25,000); The San Gabriel River Watershed; GPS and Observational Report on the San Gabriel River from the Whittier Narrows region to Seal Beach.

#### IN-KIND DONATIONS for Research / Projects

- Supplies for Screen and Gravel Pack Analysis (est. \$6,000); Donated by Johnson Screens
- DJI Phantom II (est. \$2,500); Donated by Earth Forensics Inc.
- Cave Bear, misc. fossils (est. \$200,000); Donated by Gregg Family Foundation
- Woolly Mammoth (est. \$500,000); Donated by Gregg Family Foundation
- Software (Visual Modflow) (\$2,700); Donated by Earth Forensics Inc.
- Soil sampling supplies and equipment (\$2,500); Donated by GeoProbe
- Deep Multiport Westbay Monitoring Well (\$300,000); A deep multiport monitoring well was installed on the northwestern portion of campus to develop a long-term monitoring program for groundwater in the north Orange County groundwater basin. The well was installed with sampling ports at six different zones to 850 feet below ground level. The entire project was donated.
- Miscellaneous equipment supplies and laboratory analysis have been donated for a multitude of different projects (\$50,000). These donations have been used for student thesis research and classroom activities.
- Sampling Truck (value \$30,000). The vehicle is specially designed to collect water samples downhole – equipped with twin generators and a large-capacity hydraulic system. Donated by Earth Technologies, Inc.
- Ford F-250 Pickup (\$8,000); Donated by URS Corporation
- Generator (\$2,500); Donated by Aquifer Science and Technology
- Software (Waterloo Hydrogeologic Visual Modflow, AquiferTest and Aquachem) (\$10,000)
- Software (Groundwater Vistas) (\$2,500+\$2,250 for update)
- Conference table and chairs (\$500); Donated by URS Corporation
- Arboretum Groundwater Study (approximately \$10,000); Drilling and installation of 3 monitoring
  wells for the purpose of developing curriculum for general hydrogeology. These wells are part of
  a larger project to interpret the hydrogeology of CSUF and the local area.

#### PROFESSIONAL PUBLICATIONS, ABSTRACTS, PRESENTATIONS and POSTERS

#### Peer-Reviewed Publications (Published, Accepted, Submitted)

- 1. Laton, W.R., Perez, R., Foster, J.F., 2024, *UAV Thermal Mapping as a New Tool to Document Baseline Environmental Conditions: The California High-Speed Rail through the San Gabriel Mountains, California.* Groundwater Monitoring & Remediation. http://doi.org/10.1111/gwmr.12644
- 2. Laton, W.R.; Foster, J.H. 2023. Abrupt Late Holocene Closure of San Elijo Lagoon, Northern San Diego County, California. Coasts 2023, 3, 227-239. https://doi.org/10.3390/coasts3030014
- 3. Laton, W.R., 2021. Malibu, California: A Story of Wastewater, Politics, and Science. The Professional Geologist. 2021; Vol. 58. No. 2, pages 15-19. USPS 590-810 and ISSN 0279-0521
- 4. Laton W.R., 2019. New perspectives on horizontal to vertical well ratios for site cleanup. Remediation. 2019; 30: 27–31. https://doi.org/10.1002/rem.21628
- <sup>2</sup>D. Dailey, W. Sauck, M. Sultan, <sup>2</sup>A. Milewski, <sup>2</sup>M. Ahmed, W.R. Laton, R. Elkadiri, J. Foster, C. Schmidt, and T. Al Harbi., 2015. Geophysical, geochemical, and remote sensing applications for a better understanding of the structural controls on groundwater flow in the Lucerne Valley, California. Journal of Hydrology: Regional Studies 3 (2015) 211-232. https://doi.org/10.1016/j.ejrh.2014.12.002
- Laton, W.R., 2006. Building Groundwater Monitoring Wells on Campus A Case Study and Primer. Journal of Geoscience Education (Vol. 54, No. 1), pgs 50-53. <a href="https://doi.org/10.5408/1089-9995-54.1.50">https://doi.org/10.5408/1089-9995-54.1.50</a>
- 7. Laton, W.R., Whitley, R.J., and Hromadka II, T.V., 2006. A Methodology for Identifying the Potential Source of Groundwater Contamination in a Multiple Source Problem Using a New Mathematical Approach. Hydrogeology Journal. https://doi.org/10.1007/s10040-006-0106-4
- 8. Laton, W.R., Hromadka II, T.V. and Picciuto J.A., 2006. Estimating Runoff Quantities for Flow and Volume-based BMP Design. Hydrological Science and Technology, Volume 22, No.1-4.
- 9. Laton, W.R., 2004. Seepage, Flow and Chemical Partitioning Between the City of Parchment Wellfield and the Kalamazoo River, Southern Michigan. Journal of Floodplain Management (Vol. 4, No. 1), pgs 11-32.
- 10. Perez, R., Foster, J.F. and Laton, W.R., Hydrostratigraphy of Victorville Fan and Water Resources Implications. (in prep)
- 11. Laton, W.R. and Foster, J.F., Historical Knowledge of the Toxicity of TCE in the United States. (in prep)

### Guidebooks, Full Paper Proceedings, and Articles

- 1. Laton, W.R., Perez, R., and Bausch, D., 2018. Hazard Maps for Riverside County, California. San Diego Association of Geologists annual field trip guidebook (update of earlier version).
- 2. Laton, W.R. and Krstich, B., 2010. Zoom Zoom, Public works managers are now using Google Earth to track environmental and water resources. Public Works Online. (Public Works Manual 2010)
- 3. Laton, W.R., 2005. The Cutting Edge "Teaching Hydrogeology in the 21st Century". NGWA-AGWSE News and Views. (article September 2005)
- 4. Jenson, J. and Laton, W.R., 2005. Second Annual Groundwater Summit. NGWA-AGWSE News and Views. (article September 2005)
- 5. Laton, W.R., 2004. Building Ground Water Monitoring Wells on Campus: A Case Study and Primer. NGWA-AGWSE News and Views. Vol. 1, Issue 1.
- D. Bausch, E. Gath, T. Gonzales, and R. Laton, 2000. GIS-Based Hazard Mapping and Loss Estimation in the Safety Element of the General Plan for Riverside County, California. California: EERI 6<sup>th</sup> International Conference on Seismic Zonation, Riverside County, California.
- 7. Laton, W.R., <sup>1</sup>Perez, R., and Bausch, D., 2000. *New Hazard Maps for Riverside County, California*. San Diego Association of Geologists annual field trip guidebook.
- 8. Laton, W.R., 1992. Small-Scale Coastal Cells as Control Mechanisms on Sediment Movement; Identification and Mapping. OCEANS '92, Newport, Rhode Island.

#### **Public Reports and White Papers**

- 1. Laton, W.R., Foster, J., Perez, R., and Becker, M., 2020. *Phase II Groundwater Study Palmdale to Burbank Section of California High Speed Rail*. California High-Speed Rail Authority.
- 2. Laton, W.R., 2019. Reconsidering Horizontal to Vertical Well Ratios for Site Clean-up. EnRx.
- 3. Laton, W.R., 2016. Phase 1 Groundwater Study Palmdale to Burbank Section of California High Speed Rail. California High-Speed Rail Authority.
- 4. Laton, W.R., 2016. DTSC Aquifer Test Guidance. Reviewer for draft guidance document.
- 5. Laton, W.R., 2012. Disposal of Desalination Effluent; Deep-Well Injection Feasibility San Nicolas Island, California. US Navy.
- 6. Foster, J., Laton, W.R., et al., 2008. Geologic Map Series of Mojave Region. (750, 500, 250, 24' and 15'). Mojave Water Agency. Revised series, Fall 2010.
- 7. Laton, W.R., Foster, J., et al., 2007. Oeste Hydrologic Sub-Basin Report. Mojave Water Agency.
- 8. Hromadka, II, T.V., Laton, W.R. and <sup>2</sup>Perez, R., 2006. *Hydrologic Data Report October 17-21, 2004 Storms*. Orange County Flood Control District.
- Laton, W.R., Foster, J., et al., 2007. Groundwater Atlas of Oeste Hydrologic Sub-basin. Mojave Water Agency.
- 10. Laton, W.R., Foster, J., <sup>2</sup>Ebbs, V., <sup>2</sup>Blazevic, M., and <sup>1</sup>Napoli, N., 2007. *Harper Lake Hydrologic Sub-Basin Report*. Mojave Water Agency.
- 11. Laton, W.R., <sup>1</sup>Napoli, N., and Eckhart, L., 2006. Flow between Basins –Baja Hydrologic Sub-Basin to Afton Canyon Report. Mojave Water Agency.
- 12. Laton, W.R., <sup>2</sup>Napoli, N., and Eckhart, L., 2006. Flow between Basins Este to Alto Hydrologic Sub-Basins Report. Mojave Water Agency.
- 13. Laton, W.R., <sup>2</sup>Napoli, N., and Eckhart, L., 2006. Flow between Basins Oeste to Alto Hydrologic Sub-Basins Report. Mojave Water Agency.
- 14. Laton, W.R., <sup>2</sup>Napoli, N., and Eckhart, L., 2006. Flow between Basins -Alto to Centro Hydrologic Sub-Basins Report. Mojave Water Agency.
- 15. Laton, W.R., <sup>1</sup>Napoli, N., and Eckhart, L., 2006. Flow between Basins Centro to Baja Hydrologic Sub-Basins Report. Mojave Water Agency.

- 16. Hromadka, II, T.V., Laton, W.R., and Picciuto, J.A., 2005. Estimating Runoff Quantities for Flow and Volume-based BMP Design. San Bernardino County Flood Control District.
- 17. Laton, W.R., Foster, J., et al., 2004. Este Hydrologic Sub-Basin Report. Mojave Water Agency.
- 18. Laton, W.R., Foster, J., et al., 2004. Groundwater Atlas of Este Hydrologic Sub-basin. Mojave Water Agency.
- 19. Laton, W.R., et al., 2004. San Gabriel River Watershed Atlas. Friends of the San Gabriel River.
- 20. Laton, W.R., et al., 2004. San Gabriel River Watershed QAPP and Sampling Manual. Friends of the San Gabriel River.
- 21. Laton, W.R, <sup>2</sup>Kendall, D. and <sup>2</sup>Lizzy, A., 2004. *Drilling Methods and Materials*. Online course material for NGWA.
- 22. Blazevic, M. and Laton, W.R., 2004. Mojave River Stream Gauging. Mojave Water Agency
- Laton, W.R., 2002. Taylor Yard and Los Angeles River Preliminary Groundwater and Surface Water Study, Groundwater Model of Taylor Yard and Vicinity, Los Angeles, California. California Coastal Conservancy.
- 24. Laton, W.R. and Foster, J., 2001. Sediment Quality and Depositional Environment of San Elijo Lagoon, San Diego County, California. San Elijo Nature Conservancy and Fish and Wildlife Service.
- 25. Laton, W.R. and Foster, J., 2001. Santa Clara River Watershed Inventory. Los Angeles Regional Water Quality Control Board.
- Laton, W.R. and Foster, J., 2000. The San Gabriel River Watershed GPS and Observational Report on the San Gabriel River from the Whittier Narrows region to Seal Beach. Los Angeles Regional Water Quality Control Board.
- 27. Straw, W.T., <sup>2</sup>Hascall, A.P., <sup>2</sup>Laton, W.R., and <sup>1</sup>Dalman, M., 1997. Groundwater Surface Water Interaction Study in Ross Township. City of Kalamazoo, Michigan.
- 28. Straw, W.T. and <sup>2</sup>Laton, W.R., 1993. WMU Austin Lake Aeration Feasibility Study Evaluation. City of Portage, Portage, Michigan.
- Straw, W.T., <sup>2</sup>Wardwell, D.A. and <sup>2</sup>Laton, W.R., 1992. An Evaluation of Undercurrent Stabilization Anchor System Installation at Douglas and Tawas City, Michigan. Michigan Department of Natural Resources.

#### Abstracts, Presentations, and Posters

- 1. Laton, W.R., 2024. 25-Years of CSUF Research. (Sac State Geology Department, Invited)
- 2. Hanna, T., Laton, W.R., and Kawaski<sup>2</sup>, 2023. *Physical Parameters Compared for the Installation and Development of Glass Bead and Natural Filter Packs*. (NGWA Expo)
- 3. Laton, W.R., 2022. UAV Thermal Mapping to Develop Baseline Conditions for California High-Speed Rail through San Gabriel Mountains! (SCGC Invited)
- 4. Laton, W.R., 2021. 20-Years of CSUF Research From the Mojave to the Ocean. (GRAC Invited)
- 5. Laton, W.R., 2021. Working with that new Geologist in the field. (NGWA Expo workshop)
- 6. Laton, W.R., 2021. 20-Years of CSUF Research From the Mojave to the Ocean. (ENST Invited)
- 7. Laton, W.R., 2021. A Decision Tool to Determine if Horizontal Well Systems Can Replace Vertical Well Systems. Florida Remediation Conference (recorded virtual presentation).
- 8. Laton, W.R., Havranek, T., Robinson, L. and Koenigsberg, S., 2021. Fundamentals of Horizontal Well Systems and Modeling Tools. AEHS, 30th Annual International Conference on Soil, Sediments, Water, Energy (Virtual Workshop)
- Laton, W.R., 2021. A Decision Tool to Determine if Horizontal Well Systems Can Replace Vertical Well Systems. AEHS, 30th Annual International Conference on Soil, Sediments, Water, Energy, (Virtual - Presentation)
- 10. Laton, W.R., 2021. Groundwater of California. WMU Geology (Invited)

<sup>&</sup>lt;sup>1</sup>Undergraduate Student

<sup>&</sup>lt;sup>2</sup>Graduate Student

- 11. Laton, W.R., Havranek, T., Robinson, L. and Koenigsberg, S., 2020. Fundamentals of Horizontal Well Systems and Modeling Tools. AEHS, 36th Annual International Conference on Soil, Sediments, Water, Energy (Virtual Workshop)
- 12. Laton, W.R., 2020. Groundwater of the States: California. NGWA Webinar Series.
- 13. Laton, W.R., 2020. A Decision Tool to Determine if Horizontal Well Systems Can Replace Vertical Well Systems. AEHS, 36th Annual International Conference on Soil, Sediments, Water, Energy, (Virtual). (abstract/presentation)
- 14. Laton, W.R., 2020. New Perspectives on Horizontal to Vertical Well Ratios for Site Cleanup. 12<sup>th</sup> International Conference on Remediation of Chlorinated and Recalcitrant Compounds, Battelle, Portland, OR. (abstract/presentation) (conference postponed)
- 15. Laton, W.R., 2020. Malibu California, Wastewater and Politics Cal State University, Fresno, CA. (Invited)
- 16. \*2Alonzo, T., Laton, W.R., Hanna, T., 2019. Comparing Natural Silica Sand and Glass Bead Filter Packs Used in Production Well Design and Construction. NGWA Expo, Las Vegas, NV. (abstract/presentation) (Outstanding Research Award)
- 17. Laton, W.R., 2019. The Concept of Sustainability and the Recruiting of Younger Millennials. NGWA Expo, Las Vegas, NV. (workshop)
- Laton, W.R., 2019. Reconsidering Horizontal to Vertical Well Ratios for Site Clean-up. AEHS, 29th Annual International Conference on Soil, Water, Energy, and Air. San Diego, CA. (abstract/presentation)
- 19. Laton, W.R., 2018. Take my Job. NGWA Expo, Las Vegas, NV. (workshop)
- 20. Laton, W.R., 2018. Groundwater The Water Beneath Our Feet. CSUF Fullerton Arboretum. (Invited)
- 21. \*Perez, R. and \*Laton, W.R., 2018. The Use of UAVs for Groundwater Research. California State University, San Bernardino. (Invited)
- 22. \*Perez, R. and Laton, W.R., 2017. *UAV's for Use in Groundwater Resources*. NGWA Expo, Nashville, TN. (workshop)
- 23. Laton, W.R., 2017. Introduction to Borehole Geophysics. NGWA Expo, Nashville, TN. (workshop)
- Laton, W.R., 2017. Malibu California, Wastewater and Politics. Southern California Chapter of AEG. (Invited)
- 25. Laton, W.R., 2017. Low Altitude Photography Utilizing UAVs Geologic and Hydrologic Applications. Los Angeles Basin Geological Society. (Invited)
- 26. Laton, W.R., 2016. Preparing for the Field, What to Take? NGWA Expo, Las Vegas, NV. (workshop)
- 27. Laton, W.R., 2016. Wastewater, Politics and Science. South Coast Geological Society (Invited).
- 28. Laton, W.R., 2016. Malibu, California; A Story of Wastewater, Politics and Science. Western Michigan University. (Invited)
- 29. Laton, W.R., 2016. Holding Back the Ocean and Recharging Aquifers with Treated Wastewater. Minnesota Groundwater Association, Annual Meeting. (Invited)
- 30. Laton, W.R., 2016. UAV Mapping and Business Opportunities. Ground Water Institute. Tucson, AZ. (Invited)
- 31. Laton, W.R., 2016. Malibu, California; A Story of Wastewater, Politics and Science. GSA Section meeting, Ontario, CA. (abstract/presentation)
- 32. \*Perez, R., Laton, W.R., Cruikshank, M. and <sup>1</sup>Hugh, C., 2016. *UAV Imagery and Mapping: What are the Capabilities and Limitations?* SAGEEP 2016, Denver, CO. (abstract/presentation)
- 33. Laton, W.R., 2015. Sounder Selection Show and Tell. NGWA Expo, Las Vegas, NV. (workshop)
- 34. Laton, W.R., 2015. Preparing for the Field What to Take? NGWA Expo, Las Vegas, NV. (workshop)
- 35. Laton, W.R., 2015. Using Sand Tank Models to Explain Groundwater Flow. NGWA Expo, Las Vegas, NV. (workshop)
- 36. Laton, W.R., 2015. When does it make Sense to Learn from a Person vs. Learn from a Device? NGWA Expo, Las Vegas, NV. (workshop)

- 37. Laton, W.R. and Perez, R., 2015. Low Altitude Photography Utilizing UAV's. Long Beach State University GIS Day Mixer. (Invited)
- 38. \*Laton, W.R., \*Perez, R. and \*Cruikshank, M., 2015. Low Altitude Photography utilizing UAV's Geologic and Hydrologic Applications. IGS, Riverside, CA. (Invited)
- 39. Laton, W.R. 2015. Boring Logs What's Important and What's Not: A Scientific Viewpoint and Drones for Use in Water Resources. Mountain States Groundwater Expo, Laughlin, NV. (Invited)
- 40. Laton. W.R. 2015. Backvard Soils. Natural OC, Santa Ana, CA. (Invited)
- 41. Laton, W.R. 2014. Using Google Earth for Hydrogeological Problem Solving. NGWA Expo, Las Vegas, NV. (workshop)
- 42. Laton, W.R. and \*Perez, R., 2013. Got Geological Problems-How to Use Innovative Multimedia Applications to Identify and Analyze Them. NGWA Expo, Nashville, TN. (workshop)
- 43. Laton, W.R., 2013. Hydrogeology 101. NGWA Expo, Nashville, TN. (lecture)
- 44. Laton, W.R., 2012. Hydrogeology 101. NGWA Expo, Las Vegas, NV. (lecture)
- 45. Laton, W.R., 2012. Using Sand Tank Models to Teach about Groundwater. NGWA Expo, Las Vegas, NV. (workshop)
- 46. Laton, W.R., 2012. Geothermal Forum: Business Success Through Excellent Performance Hydrogeology (Really) Does Matter. NGWA Expo, Las Vegas, NV (lecture)
- 47. Laton, W.R., 2011. *Using Sand Tank Models to Teach about Groundwater*. NGWA Expo, Las Vegas, NV. (workshop)
- 48. \*2Dailey, D.R., Sauck, W.A., Sultan, M., 2Milewski, A., Laton, W.R. and Foster, J.H., 2011. Geophysical and Remote Sensing Applications for better understanding of the Structural (Faults/Basement Uplifts) Controls on Groundwater Flow in the Lucerne Valley, California. GSA Annual Meeting. (abstract/presentation)
- 49. Laton, W.R., 2011. Implications of Surface Water/Groundwater Interaction or Groundwater and the Impacts on Surface Water Delivery. Declining Groundwater Levels: Measuring, Monitoring, and Mitigation. NGWA Virtual Conference.
- 50. Laton, W.R., 2011. Hydrogeology 101. Santa Susana Field Laboratory seminar series. (workshop)
- 51. \*2Barker, S., Laton, W.R. and Foster, J.H., 2010. An investigation of potential surficial recharge in the Lucerne Valley groundwater basin, Mojave Desert, CA. Anaheim, CA. GSA Abstract with Programs. Vol. 42, No. 4, p. 97, Paper No. 45-2.
- 52. Laton, W.R., 2010. Boring Logs What's Important and What's Not: A Scientific Viewpoint. GRA Webinar.
- 53. Laton, W.R., 2010. Using Google Earth in Water Resources Research. NGWA Webinar.
- 54. Laton, W.R., 2010. *Hydrogeology 101*. NGWA National McEllhiney Lecture 2010, Sponsored by the NGWAREF (Invited 7 presentations throughout the U.S.)
- 55. Laton, Richard, \*2Al Harbi, Talal, Sauck, William A., Foster, John, Sultan, Mohamed, 2Milewski, Adam, 2Marsala, Peter, 2Balekai, Rajesh, and 2Salim, Hassan, 2009. *Use of Geophysical and Remote Sensing Data for a Better Understanding of the Hydrologic Role of Faults in the Mojave Desert*. GSA Annual Meeting. (abstract/poster)
- 56. Laton, W.R., 2009. Using Google Earth. NGWA Expo, New Orleans, LA. (workshop)
- 57. Laton, W.R., 2009. Hydrogeology 101. NGWA Expo, New Orleans, LA. (workshop)
- Laton, W.R., 2009. Boring Logs What's Important and What's Not: A Scientific Viewpoint. NGWA National McEllhiney Lecture 2009, Sponsored by NGWAREF. (Invited 30+ presentations throughout North America)
- Foster, J.H. and \*Laton, W.R., 2008. Groundwater Resources Sustainability in the Victorville Area: Results from the Oro Grande Wash Recharge Pilot Study. Association of Engineering Geologist. (abstract/presentation)
- 60. \*1Dailey, D., Laton, W.R., and Foster, J.H., 2008. New Detailed Model for El Mirage Subsurface Geology, El Mirage, CA. GRA Annual Meeting. (abstract/poster)

- 61. \*1Velarde, J.C., Foster, J.H., and Laton, W.R., 2008. The Geology of Spring Systems in the Vicinity of White Mountain/Silver Creek, Lucerne Valley, San Bernardino County California. GRA Annual Meeting. (abstract/poster)
- 62. \*2Monzon, E. and Laton, W.R., 2008. Estimating Applied Irrigation for Urban Landscapes in South Coast California, using Theoretical and Conventional Means. GRA Annual Meeting. (abstract/poster)
- 63. \*2Lizzi, A., Laton, W.R., Foster, J.H., 2008. Evaluation of the Potential Groundwater Resources of A Confined Aquifer, San Diego County, California. NGWA Groundwater Summit (abstract/presentation)
- 64. Laton, W.R., 2006. Surface Water and Ground Water: How the Two Interact. NGWA National Meeting. (Invited)
- 65. \*¹Cruikshank, M.J., Foster, J.H. and Laton W.R., 2006. Presence of Deep High-Quality Ground Water in El Mirage Valley, San Bernardino County, California. NGWA Groundwater Summit (abstract/poster) (Outstanding Research Award)
- 66. \*2Surko, T., Armstrong, P.A. and Laton, W.R., 2006. Gravity Survey of Lucerne Valley Ground Water Basin, Mojave Desert, Southern California: Implications for Basin Geometry and Structure. NGWA Groundwater Summit (abstract/presentation)
- 67. \*2Barthel, P.S. and Laton, W.R., 2006. Desert Studies Center: A Hydrogeologic Model and Water Budget. NGWA Groundwater Summit (abstract/presentation)
- 68. Laton, W.R., 2005. *Methods to Determine Basin Yield*. GRA Groundwater Resources Series Basin Yield and Overdraft: Scientific and Legal Perspective. (Invited)
- 69. Laton, W.R., 2005. Borehole Logging from Sample Collection to Borehole Geophysics. Presented at NSF Workshop on "Teaching Hydrogeology in the 21st Century". (presentation/lab write-up)
- 70. Laton, W.R., 2005. Water Budget Analysis A Story of Two Arid Region Groundwater Basins. CEA-Crest Symposium on Arid Hydrology. (abstract/presentation)
- 71. \*Laton, W.R., Hromadka, T., Yeager, M., Picciuto, J. and Whitely, B., 2005. A New Method for Estimating Runoff Quantities for Flow and Volume-based BMP Design. CASQA Conference. (abstract/presentation)
- 72. \*2Lizzi, A.L., Laton, W.R. and Foster, J., 2005. Evaluation of the Potential Groundwater Resources of the Golem Well West Rancho Bernardo, San Diego County, California. NGWA 2005 Groundwater Summit. (abstract/poster)
- 73. \*2Boeke, B., Laton, W.R. and Foster, J., 2005. Groundwater Potential for Harper Dry Lake: Implications for Ground Water Availability in Harper Valley, San Bernardino County, California. NGWA 2005 Groundwater Summit. (abstract/poster)
- 74. \*2Kolstad, K. and Laton, W.R., 2005. *Hydrocarbon Soil Vapor: Actual vs Predicted*. NGWA 2005 Groundwater Summit. (abstract/poster)
- 75. \*1Napoli, N. and Laton, W.R., 2005. *Hydrogeologic Evaluation of a Desert Groundwater Basin; Lucerne Valley, California*. NGWA 2005 Groundwater Summit. (abstract/poster)
- 76. \*2Perez, R. Foster, J. and Laton, W.R., 2005. The Redefining of a Groundwater Basin, Alto Sub Basin, Southwestern Mojave Desert, California. NGWA 2005 Groundwater Summit. (abstract/poster)
- 77. \*2Surko, T.L., Armstrong, P. and Laton, W.R., 2005. Gravity Survey of Lucerne Valley Groundwater Basin, Mojave Desert, Southern California: implications for basin geometry and structure. NGWA 2005 Groundwater Summit. (abstract/poster)
- 78. \*¹Blazevic, M., ¹Napoli, N., Foster, J. and Laton, W.R., 2004. Subsurface Geologic Investigation of a closed Alluvial Basin: Lucerne Valley, San Bernardino County, California. Groundwater Resources Association of California Annual Meeting. (abstract/poster)
- 79. \*INapoli, N., IBlazevic, M., Laton, W.R. and Foster, J., 2004. *Hydrogeologic Evaluation of a Desert Groundwater Basin; Lucerne Valley, California*. Groundwater Resources Association of California Annual Meeting. (abstract/poster)
- 80. \*2Perez, R., Foster, J. and Laton, W.R., 2004. *Just how deep is it? Alto Deep Well and its impacts to Alto Groundwater Sub-Basin Geology*. Groundwater Resources Association of California Annual Meeting. (abstract/poster)

- 81. <sup>2</sup>Hunt, S. and \*Laton, W.R., 2004. *Update on Geochemical Analysis of the Central Basin, Los Angeles County, California*. Groundwater Resources Association of California Annual Meeting. (abstract/poster)
- 82. \*2Haj-Manouchehri, D. and Laton, W.R., 2003. Water Quality in Relation to Watershed Management in the Lower San Gabriel River, Southern California. WRI conference (abstract/poster)
- 83. Laton, W.R., 2003. Lessons Learned; Groundwater Flow Model Taylor Yard, Los Angeles. South Coast Geological Society. October 6, 2003. (Invited)
- 84. \*Laton, W.R. and <sup>1</sup>Dolmat, J., 2003. *Deep Multiport Research Monitoring Well, CSF-1, Fullerton, CA: Stratigraphy, Lithology and Geologic Setting*. National Ground Water Conference. (abstract/TIPS)
- 85. <sup>2</sup>Figueroa, O. and \*Laton, W.R., 2003. Ground Water Modeling of a Coastal Aquifer Malibu, California. National Ground Water Conference. (abstract/TIPS)
- 86. \*2Williams, S. and Laton, W.R., 2003. Hydrogeologic Investigation of a Shallow Aquifer System Using Long Term Aquifer Tests and Water Level Monitoring, Lower Borrego Canyon Wash, Irvine CA. National Ground Water Conference. (abstract/TIPS)
- 87. \*2Hasegawa, S. and Laton, W.R., 2003. Risk Assessment of Point and Non-Point Source Pollution on Water Resources along the Santa Ana River. California Groundwater Conference. (abstract/poster)
- 88. \*1Dolmat, J. and Laton, W.R., 2003. Deep Multiport Research Monitoring Well, CSF-1, Fullerton, CA: Stratigraphy, Lithology and Geologic Setting. California Groundwater Conference. (abstract/poster)
- 89. \*2Williams, S. and Laton, W.R., 2003. Hydrogeologic Investigation of a Shallow Aquifer System Using Long Term Aquifer Tests and Precipitation Induced Recharge Data Lower Borrego Canyon Wash, Orange County California. California Groundwater Conference. (abstract/poster)
- 90. <sup>2</sup>Hunt, S. and \*Laton, W.R., 2003. Geochemical Analysis of the Central Basin, Los Angeles County, California. California Groundwater Conference. (abstract/poster)
- 91. Laton, W.R., 2002. Taylor Yard and Los Angeles River, Preliminary Groundwater and Surface Water Study Groundwater Model of Taylor Yard and Vicinity Los Angeles, California. NGWA National Meeting. (abstract/poster)
- Otto Figueroa and \*Laton, W.R., 2002. Hydrogeologic Characterization and Assessment of Impacts of Wastewater Discharge for Proposed Construction, Trancas Canyon, Malibu, California. NGWA National Meeting. (abstract/poster)
- 93. \*Laton, W.R., <sup>2</sup>Sean Hunt, and Foster, J., 2002. The Impact of Groundwater Surface Water Interaction on Contaminant Distribution, San Elijo Lagoon, California. NGWA National Meeting. (abstract/poster)
- 94. Laton, W.R., 2002. Taylor Yard and Los Angeles River Preliminary Groundwater and Surface Water Study, Groundwater Model of Taylor Yard and Vicinity, Los Angeles, California. California Coastal Conservancy. (Invited)
- 95. Laton, W.R., 2001. Distance Calibration of Earth Images To design and develop a Web delivered lesson showing an Advance in Information Technology that can be used in a Science Learning Environment for In-service Teachers (online lesson plan).
- 96. Laton, W.R., 2001. The Role of Groundwater in Geologic Hazards. California Science Academy (CEA-Crest). (abstract/presentation)
- 97. Laton, W.R., 2001. Natural Hazards Mapping, Thailand. Thailand Geological Survey. (Invited)
- 98. Laton, W.R., 2001. Subsidence evaluation and assessment, Bangkok, Thailand. Thailand Geological Survey. (Invited)
- 99. \*Laton, W.R., \*1Perez, R., and \*1Figueroa, O., 2000. *Natural Hazard Mapping A GIS Approach*. CSUF Geology Department.
- 100. Laton, W.R., 2000. Natural Hazards Assessment of Temecula, California. San Diego Association of Geologists annual field trip. (Invited)
- 101. \*Sauck, W. A., Laton, W.R., <sup>2</sup>Seng, D.L., and <sup>2</sup>Vandereide, M.A., 2000. Ground-penetrating radar investigations of nearshore sediments of eastern Lake Michigan. IAGLR 2000.

- 102. Laton, W.R., 1999. Watershed Management and Sampling Protocol. Korean Ministry of Environment and Environmental Management Corporation short course. (Invited)
- 103. Laton, W.R., 1999. Environmental Sampling what, when and why. Port of Los Angeles, Environmental Group. (Invited)
- 104. Laton, W.R., 1998. Single Point Pneumatic Slug Test, Soil Vapor Extraction (SVE) Testing During Initial Site Investigation. Hazardous Waste Section, SMARTech '98, Raleigh, NC. (abstract/presentation)
- 105. Laton, W.R., 1998. SimulProbe® Environmental Core Barrel. EPA National Site Assessment Conference. Denver, CO. (Invited)
- 106. \*Marcus, D.L., <sup>2</sup>Bonds, C.L. and Laton, W.R., 1997. Rapid Screening using the SimulProbe Multimedia Sampler – Case Histories and Future Directions. New England Environmental Exposition. (abstract/presentation)
- 107. \*2Laton, W.R., 2Hascall, A.P., 2Atekewana, E.A., Hampton, D.R., 1996. Seepage Meter Spatial and Temporal Variability in the Study of Groundwater Interaction with Surface Water Features. American Geophysical Union, San Francisco, CA. (abstract/presentation)
- 108. <sup>2</sup>Laton, W.R., 1996. Well Grouting Research. Michigan Environmental Health Association, Ground Water Conference, Thompsonville, MI. (Invited)
- 109. <sup>2</sup>Laton, W.R., 1996. SimulProbe Sampling in Contaminated Areas. University of Michigan Summer Hydrogeology Field Course, Wortsmith Research Center, MI. (demonstration/presentation)
- \*Barnes, D.A., 2Kovacich, M.S., 2Limez, S., and 2Laton, W.R., 1995. Error Analysis in Great Lakes Beach Profile Surveying Techniques. Canadian Coastal Conference, Dartmoth, Nova Scotia. (abstract/presentation)
- 111. Laton, W.R., 1995. Environmental Uses of Low-Altitude Aerial Photography. Colloquium on Environmental Earth Science, Western Michigan University, Kalamazoo, MI.
- 112. <sup>2</sup>Laton, W.R., 1995. Environmental Uses of Low-Altitude Aerial Photography. Hi-Shots International Conference, Saint Louis, Missouri. (Invited)
- \*Mackey, S.D., Guy, D.E., <sup>2</sup>Laton, W.R., and <sup>2</sup>Kovacich, M., 1994. Geologic Framework of an Eroded Lake Erie Coastal Marsh Metzger Marsh, Ohio. North-Central Geological Society of America, Kalamazoo, Michigan. (abstract/presentation)
- 114. \*Vincent, R.K., <sup>2</sup>Laton, W.R. and <sup>2</sup>Sattler, J., 1993. Detailed Modeling of Solid Waste Landfill Surface Water Run-off from High Resolution Elevation Data Automatically extracted From Stereo Photos Taken by a Camera on a Tethered Balloon Platform. Association of Engineering Geologists, San Antonio, Texas. (abstract/presentation)
- Laton, W.R., 1993. Site Characterization and Mapping Utilizing a Tethered Balloon System. HI-SHOTS International Convention, Saint Louis, Missouri. (Invited)
- 116. Laton, W.R., 1992. Coastal Processes and Use of a Blimp. Shoreline Erosion and Coastal Processes in Berrien County, Lake Michigan College Environmental Center, St. Joseph, Michigan. (abstract/presentation)
- 117. \*2Laton, W.R. and Straw, W.T., 1992. Small-Scale Coastal Cells; Identification and Mapping. First Thematic Conference, Remote Sensing for Marine and Coastal Environments, New Orleans, Louisiana. (abstract/poster)
- 118. Laton, W.R., 1991. Undercurrent Stabilization Anchor Systems at Tawas on Lake Huron and Douglas on Lake Michigan – A One-Year Study. Michigan Academy of Science, Ypsilanti, Michigan. (abstract/presentation)

<sup>&</sup>lt;sup>1</sup>Undergraduate Student; <sup>2</sup>Graduate Student; \* Presenter

### SUPERVISED COMPLETED THESES

Student Name	Year	Degree Thesis Title		
Villegas, Isaak	2023	BS	PFAS Chemical Monitoring in Orange County, California	
Williams, Andrew	2023	MS-ENST	Monitoring Water Quality of a Wetland: A Case Study in Norco, CA	
Montgomery, Jakob	2022	BS	Flowability of Filter Packing Materials Based on Grain Size and Fluid	
Esparza, Nestor	2022	BS	Fate and Transport of Contaminants in the South Basin Plume	
Velasco, Melissa	2022	BS	Chino Basin Dairy Farm Nitrate Contributions	
Kreller, Ethan	2021	BS	Analysis of Caltrans Boring Logs to Evaluate the Shallow Subsurface Vulnerabilities	
Nagata, Brayden	2021	BS	Relationship Between Groundwater, Selenium Concentration, and the Corcoran Clay, NW Fresno County, CA	
Zeko, Mike	2021	BS	Pomona Perchlorate Study	
Strohm, Chelsea	2021	MS-ENST	The Use of Physical Groundwater Models in Higher Education	
Allen, Ronald	2020	BS	The Carboniferous and Pleistocene; An Analysis on the Genus Preset within Geologic Time	
Rangel, Liliana	2020	BS	Water Budget of the San Gorgonio Mountains Mill Creek and Santa Ana River Water Basin	
Martinez, Charles	2020	BS	Implications of Grain Size on Hydraulic Conductivity	
Murphy, Patrick	2020	MS-ENST	Evaluating the Fate of Legacy 1,4-Dioxane and NDMA in Orange County's Coastal Aquifers	
Severin, Vitoria	2020	MS-ENST	Analyzing the Mission Valley Aquifer as a Groundwater Source in San Diego, CA.	
Barragan, Adrian	2019	BS	Examining the Water Quality from a Section of the Santiago Creek	
Chacon, Diana	2019	MS	Thermal Infrared Remote Sensing for Water Temperature Assessment Along the Santa Ana River Using an Unmanned Aerial Vehicle (UAV) System	
Alonzo, Terrinda	2018	BS	13-Year Analysis of Water Pressure and Chemical Changes from Well CSF-1, Fullerton, CA	
Case, Aaron	2018	MS-ENST	Perchlorate in Urban and Industrial Environments	
Cragg, Byron	2018	BS	Designing Scientific Payloads for Use on Extra-Planetary Rovers	
Emilio, Chelsea	2018	MS-ENST	Urban Firework Fallout	
Escobar, Adrian	2018	BS	Ground Source Heat Pump Potential Characterization for California State University, Fullerton	
Lopez, Daniel	2018	MS-ENST	Should California Price Water as a Commodity to Increase Conservation?	
Meadows, Adam	2018	BS	Investigation and Monitoring the Spread of Water Contaminates Using a Open-Source Database in the Orange County Area	
Offner, Erica	2018	MS-ENST	Carbon Dioxide Levels in Water Vapor	
Vanderwal, Joshua	2018	BS	Safety Element for Cal State University Fullerton – Understanding of Hazards Surrounding the Campus	
Grajeda, Remington	2017	MS-ENST	Shaping Environmental Attitudes in Students: An Inquiry-based Approach	

Kennedy, Taylor	2017	MS-ENST	Investigation of the Laguna Cell Beaches Using Lidar and Erosional Examination	
Masters, John Paul	2017	MS-ENST	Subsurface Analysis of Orange County Water District's La Palma Groundwater Recharge Basin in Anaheim, California	
Forester, Danielle	2017	BS	Water Budget and Audit: Premier Color Nursery	
Ibarra, Nancy	2016	BS	Drilling Methodology: A Field Guide and its Use for the Drilling Industry	
Pham, Christine	2016	MS-ENST	Efficacy of Capsaicin-based epoxy coating for preventing attachment of Quagga mussels (Dresissena Bugensis)	
Battig, Lisa	2015	MS-ENST	An Educational Kit Elucidating the Connections Between Sanitation, Hygiene and Waterborne Disease	
Masters, John Paul	2015	BS	Subsurface Analysis of fluvial sediments from the Holocene-Pleistocene Epochs at California State University, Fullerton, California	
Natividad, Anthony	2015	BS	A Hydrogeological Survey of a Mountainous Region: The Significance of Monitoring a Water Budget at a Localized Source	
Carreon, Rosangela	2014	MS-ENST	Remote Sensing Climatic Impact on Snow Cover for the San Gabriel Mountains in Southern California	
Cortez, Lucy	2014	BS	Wetlands Delineation using Dendrochronology and Historical Rainfall Data to Cross-date the Climatic Stress Regimes in the Prado Dam Basin Located in Corona, Riverside County, California	
Law, Natalie	2014	BA	Evolution and Growth of a Mitigation Wetland: A Case Study in Norco, California	
Morlan, Randall	2014	MS	The Effects of Agricultural Activities on the Migration of the Hinkley Chromium Plume, San Bernardino County, California	
Dubberke, Kirk	2013	BS	Malibu Creek Watershed – Aquifer Testing Analysis	
Kennedy, Taylor	2013	BS	Metasomatism of the Bird Spring Formation near Slaughterhouse Sprin California	
Irani, Fabian	2013	BS	The Use of Groundwater Fluctuations in a Tidal Zone for the Determination of Aquifer Properties	
Lockhart, Benjamin	2013	MS-ENST	Colonial Nesting Seabirds in Burris Basin: Forage Prey Availability Assessment and Habitat Enhancement Suggestions	
Maine, Lindsay	2013	MS-ENST	Media Blending: Which Combination is Best for Stormwater Discharge from Scrap Metal Recycling Operations?	
Vavricka, Emily	2013	MS-ENST	A Forensic Evaluation of Dry Cleaners: A Case Study in Santa Ana, California	
Cadaret, Erik	2012	BS	Hydrogeologic Investigation and Geochemistry Analysis of the Sheep Creek Fans Regional Aquifer, San Bernardino County, CA	
Dotzer, Alec	2012	BS	Lithologic Analysis of a Soil Layer at Various Points via a Biosparge Pile Test at a Contaminant Impacted Site in Coachella Valley, Riverside County, CA	
Hoffman, Michael	2012	MS	Hydraulic Tomographic Modeling of the Yorba Linda Water Well Field, Yorba Linda, California	
Martin, Allen	2012	MS-ENST	Lower Owens River Project, Recovery: A longitudinal imagery analysis of near river vegetation change along the Owens River, Owens Valley, Inyo County, California	
Sickler, Heidi	2012	MS-ENST	Environmental Change in the Wetland Ecosystem of Fish Slough in Bishop, California Derived from Wetland Delineation Methods and Aeria Photography	

Xayarath, Van	2012	MS-ENST	Orange County's Water Supply: A preliminary research to convert storm channels to natural bottom streams for basin recharge	
Evans, Patrick James	2011	MS-ENST	Desalination in Southern California: The Inevitable wave of the future!	
Rimbenieks, Mikaila	2011	MS-ENST	Quantifying Forest Natural Background and Road Sediment Yield in Big Bear Lake, California	
Barker, Shelby	2010	MS	An Investigation of the Potential for Surficial Recharge in the Lucerne Valley Groundwater Basin, Mojave Desert, CA	
Velarde, John	2009	BS	The Geology of Spring Systems in the Vicinity of White Mountain/Silver Creek, Lucerne Valley, San Bernardino County, California	
Carle, Chris	2009	BS	The Phase I Environmental Site Assessment	
Luedy, Justin	2008	MS-ENST	Testing the Relationship of Dissolved Metals in Stormwater, Newport Beach, California	
Barthel, Peggy	2008	MS	Water Budget and Hydrogeologic Model of Spring Flow at Limestone Hill, Zzyzx Desert Studies Center	
Daley, Dale	2008	BS	Subsurface Mapping of the El Mirage Groundwater Barrier, San Bernardino County, California	
Monzon, Eric	2008	MS-ENST	Estimating Applied Irrigation for Urban Landscapes in South Coast Southern California, Using Theoretical and Conventional Means	
Ebbs, Veva	2008	MS-ENST	Quantification of Sub-Surface Groundwater Flow from Middle Mojave River Valley Basin into the Harper Lake Basin	
Kolstad, Kenneth	2007	MS	Analysis of a Steady-State Model: Prediction of Trichloroethylene Vapo Concentration, Using Known Dissolved Phase Concentration	
Lizzi, Anthony	2007	MS	Evaluation of the Potential Groundwater Resources of the Golem Well West Rancho Bernardo, San Diego County, California	
Patschull, Eric	2007	MS	Evidence of a North Projecting Ancient Boulder Thalweg in Latest Quaternary Deposits of the Santa Ana River, Orange County, California	
Cruikshank, Michael	2006	BS	Hydrogeological Investigation of an Open Alluvial Basin: Oeste Hydrologic Sub-basin, San Bernardino County, California	
Dolmat, Joan	2006	BS	Deep Multiport Research Monitoring Well, CSF-1, Fullerton, CA: Stratigraphy, Lithology and Geologic Setting	
Hunt, Sean	2006	MS	Artificial Recharge as Possible Causes of Observed Long –Term Change in Transmissivity for the Aquifers of the San Pedro Formation in the Central Basin of the Greater Los Angeles Basin, California	
Williams, Steve	2006	MS	Hydrogeologic Investigation of a Shallow Aquifer System with Emphasis on Precipitation Induced Groundwater	
Surko, Tammy	2006	MS	Gravity survey of Lucerne Valley, San Bernardino County, Mojave Desert, southern California: implications for basin geometry and structur	
Blazevic, Mike	2005	BS	Hydrogeological Investigation of a Closed Alluvial Basin: Lucerne Valley, San Bernardino County, California	
Napoli, Nick	2005	BS	Change in Groundwater Storage in the Lucerne Valley Groundwater Sub- Basin — 1954 To 2002, Lucerne Valley, California	
Nguyen, Chinh	2005	MS-ENST	Application of Convey Hull in Identifying Pollution Sources in the	
Brendle, Christine	2004	BS	Remediation of Soil and Groundwater at a Former Service Station	

Hajmanouchehri, Daneh	2004	MS-ENST	Water Quality in Relation to Watershed Management in The Lower San Gabriel River, Southern California	
McCurdy, Jim	2004	MS-ENST	Water Chemistry and Groundwater Flow for the San Bernardino Mountains	
Versluis, Patrick	2004	MS-ENST	The Fate of Perchlorate: A Look at Perchlorate Entering Orange County Groundwater	
Yuen, Pansy	2004	MS-ENST	Performance Assessment on Water Quality and Biological Effects of Urban Stormwater Runoff, Norco Hills Wetland, Riverside County, California	
Evans, Rachel	2003	BS	Water Quality Analysis - Yellowstone National Park	
Figueroa, Otto	2003	MS	Groundwater Flow Model of a Coastal Aquifer, Malibu, California	
Hasegawa, Shuichi	2003	MS-ENST	Environmental Hazard Risk Assessment on Water Resources along the Santa Ana River	
Kerza-Kwiatecki, Paul	2003	MS-ENST	Monitoring the Rocky Inter-Tidal Zone of Crystal Cove State Park; Creation of an interactive GIS bio-database	
Springer, Ben	2003	MS-ENST	The Importance of Wetland Monitoring: A Case Study of a Restored Wetland in Norco, California	
Thomas, Sean	2003	BS	Dewatering Plan for the El Toro Area	
DeKraker, Dan	2003	BS	Development of a Ninth Grade Earth Science Course	
Brand, Randy	2002	BS	Hydrogeologic and Geologic Considerations for Selected sites near the Santa Margarita, Upper Ysidora, and Lower Ysidora Groundwater Bas in Southern California	
Figueroa, Otto	2002	BS	Hydrogeologic Characterization and Assessment of Impacts of Wastewater Discharge for Proposed Construction, Trancas Canyon, Malibu, California	
Rosales, Tom	2002	MS-ENST	An examination of the benefits and costs to implement the Municipal Storm Water Permit for Orange County – similarities and differences between coastal and inland cities	
Schmucker, Kelly	2002	MS-ENST	Water Quality of a Wetland A Case Study in Norco, CA	
Wiles, Steffy	2002	BS	Angels Camp - Gamma Ray Logging Examination and Correlation	
Eckhart, Lance	2001	MS-ENST	Vertical Gradient Investigation of a Southern California Landfill	
Fields, David	2001	BS	Orange County Groundwater Contour Maps for 2000	
Rashidi-Fard, Shaghayegh	2001	BS	Water Quality Testing and Monitoring Program at the Santa Rosa Ecological Reserve	
Vortis, Kevin	2001	BS	Geologic History of San Elijo Lagoon San Diego County, California	
Mathew Blinstub	2000	MS-ENST	Spatial and Temporal Differences in Surface Water Quality in Newport	

#### SELECTED SHORT-COURSES, WORKSHOPS ATTENDED

- Johnson Screens Groundwater and Wells
- IGSHPA Train the Trainer Course
- NGWA Keeping the Pump Primed, Aquifer Sustainability
- AAPG Environmental Regulatory Course
- Advanced Technologies for Accelerated Natural Attenuation
- Applied Microbiology Understanding Bacterial Augmentation, Montreal, Canada
- Baroid Industrial Drilling Products Drilling and Boring Fluids
- CWEA How to Start, Perform and Complete a Successful Public Works Water/Wastewater Project
- EPA Bioremediation of Hazardous Wastes: Research, Development, and Field Evaluations
- EPA Natural Attenuation; EPA Statistical Analysis of Ground Water Data (GRITSTAT)
- EPO/GRA Aquifer Remediation: Bioremediation and Oxidation Technologies
- FEMA Advanced HAZUS Training for GIS Professionals
- Managing Toxics in Michigan Air, Waste and Remediation
- MGWA & MDPH Ground Water & Wells Fundamentals
- Michigan Citizens Conference/Workshop on Great Lakes Areas of Concern
- NGWA Remediation of Ground Water Contamination
- NSF The Cutting Edge "Teaching Hydrogeology in the 21st Century"
- EPA Protecting Water Quality through Land Use Planning & Zoning
- · Reducing Risk in High Seismic Hazard Zones
- Seismic Reflection/Refraction Interpretation

#### **AFFILIATIONS**

- California Groundwater Association
- Groundwater Resources Association of California
- International Association of Hydrogeology
- National Ground Water Association
- South Coast Geological Society
- International Ground Source Heat Pump Association
- American Institute of Professional Geologists

#### VOLUNTEER WORK

- WMU Spring Geobree (2021 present)
- WMU Alumni Gathering (2019 present)
- CSUF Alumni Fall Dinner (2013 present)
- CSUF Geology Research Day (2017 present)
- Santiago Middle School Taught Plate Tectonics and Science (2018)
- Science Olympiad Assistant (2013 17)
- Elementary School presentations annually: "The Water Cycle"
- Little League: Coaching assistant, scorekeeper (2010 15)
- CSUF Gerontology Seminar Series (2005)
- Boy Scouts of America Troop, Identification of Rocks (2000 2008)
- NGWA Developed online Well Construction and Development Course (2004)
- El Dorado Nature Center Provided expertise for a variety of activities.
- National Sanitary Foundation Worked on a task force to rewrite standards for water well materials.

# Appendix B

1934	Report	Mojave River Investigation - Bulletin No. 47	State of California - Department of Public Works
1993	Appendix	Volume II Appendix A to the judgement (City of Barstow, et. Al. vs. City of Adelanto)	
1553	Пррении	Volume in Appendix A to the judgement (and a parties in a	
1996	Report	Ground-water and surface-water relations along the Mojave river, Southern California	U.S. Geological Survey
2001	Report	Simulation of ground-water flow in the Mojave river basin, California	U.S. Geological Survey
8/1/1967	Report	Mojave River Groundwater Basins Investigation Bulletin No 84	DWR
1/1/1996	Report	Relations along the Mojave River USGS WRIR 95-4189	USGS
1/10/1996	Report	Judgement after trial	
1/10/1330	nepore	Table to the state of the state	
10/22/2002	Report	Mojave River Transition Zone Recharge Project - Phase 1 - Transition Zone Hydrogeology - Draft	URS
3/13/2003	Report	Mojave River Transition Zone Recharge Project - Phase 1 - Transition Zone Hydrogeology	URS
10/1/2005	Report	Groundwater flow between basins report - SubareasMojave River Basin - Centro- Baja Hydrologic	Nicholas Napoli/W. Richard Laton Califor State University, Fullerton/ Department Geological Sciences
20/2/2000	Report- Appendix/	Groundwater flow between basins report - SubareasMojave River Basin - Centro- Baja	
10/1/2005	Figures	Hydrologic (Appendix A, Figure 1-6, Gradient analysis and flow calcs)	
10/29/2008	Report	Rules and regulations of the Mojave basin area watermaster	
10/25/2002	1.00	Memo sent to : Watermaster From: Robert C. Wagner Re: Baja Water Supply Issues - Extent of	117
1/25/2012	Memorandum	future rampdown in Baja	Mojave Basin Area Watermaster
2/22/			
7/1/2013	Report	Final Report Conceptual Hydrogeologici Model and Assessment of Water Supply Demand	Todd Engineers
2/1/2015	Report	Volume 1: Report Baja areawide sustainability plan	TG Solutions
2/24/2015	Presentation	Baja Areawide sustainability plan recap, part 2	
5/1/2018	Report	Twenty-Fourth annual report of the Mojave basin area watermaster - Water year 2016-17	
5/1/2018	Report	Final draft- Twenty -Fourth annual report of the Mojave basin area watermaster - Water Year 2016-2017	
5/1/2018	Appendices	(Appendix A-I	
3/1/2010	rappendices	(rippermix)	Superior court of the state of California,
7/9/2018	Questions	Judge questions	County of Riverside
	Target Town	Conceptual Hydrogeologic Model and Assessment of Water Supply and Demand for the Centro	A distribution
7/13/2018	Report	and Baja Management Subareas Mojave River Groundwater Basin	Todd Engineers
9/26/2018	List	Mojave basin area watermaster owners address list	
2/28/2024	Report	Mojave Basin Area Waermaster Appendix A Alto & Centro Subarea Water Supply Update	Wagner & Bonsignore Engineers
2/20/2024	Report	Mojave Basin Area Waermaster Appendix B Transition Zone Subarea Water Supply Update	
2/28/2024 9/6/2024	Declartion	Declaration of Toby B. Moore in Support of Golden State Water Company	
9/6/2024	Declartion	Declaration of Toby B. Moore in Support of Golden State Water Company	
		Hydrologic Conditions and Water Flow Between the Alto Subarea and the Centro Subarea of the	Aquilogic
9/6/2024	Expert Report	Mojave Basin	Aquilogic
9/30/2024	Declartion	Declaration of Antony Brown in Support of Golden State Water Company  Watermaster Report for Water Year 1993-94; 1993-94; 1994-95; 1995-96; 1996-97; 1997-98;	
1995-2017	Reports	Watermaster Report for Water Year 1993-94; 1993-94; 1993-95; 1993-96; 1996-97; 2000-01; 2001-02; 2002-203; 2003-04; 2004-05; 2005-06; 2006-07; 2007-08; 2008-09; 2009-10; 2010-11; 2011-12; 2012-13; 2013-14; 2014-15; 2015-16; 2016-17, 2017-2018, 2018-2019, 2019-2020, 2020-2021, 2021-2022, 2022-2023	
	Mehalts	Appendix B - Producer replacement water and makeup water obligations and assessment fur foe	
2016-2017	Appendix	2016-17	24 V. W. V.
2020-2021	Report	Fiscal Year 2020-21 Annual Budget	Mojave Water Agency
Date	Туре	Title	Consultant
		Water budgets and flow budgets	
N/A N/A	Budgets	NSRLA Statement on Ramp-down in Baja	

## Appendix C

## COPY

FILED 1 DIANA J. CARLONI (SBN 100460) SUPERIOR COURT OF CALIFORNIA COUNTY OF RIVERSIDE Attorney at Law 16195 Siskiyou Rd., Suite 130 Apple Valley, CA 92307 Telephone: (760) 946-9910 Facsimile: (760) 946-9920 OCT 0 1 2018 3 D. Williams 5 Attorney for Plaintiff, NEWBERRY SPRINGS RECREATIONAL LAKES ASSOCIATION 6 7 8 SUPERIOR COURT OF THE STATE OF CALIFORNIA 9 10 COUNTY OF RIVERSIDE 11 CITY OF BARSTOW, et al. CASE NO: CIV 208568 12 Plaintiffs, DECLARATION OF DR. W. RICHARD 13 LATON, PG, Chg - SUPPLEMENTING THE RESPONSE OF NEWBERRY VS. SPRINGS RECREATIONAL LAKES ASSOCIATION TO THE STATUS CONFERENCE ORDER OF JULY 9, 14 CITY OF ADELANTO, et al. 15 Defendants. 2018. 16 AND RELATED CROSS-ACTIONS Hearing Information: 17 Date: October 12 2018 Time: 1:30 PM 18 Dept: Before the Hon. Craig G. Riemer, Judge 19 20 21 22 DECLARATION FOLLOWS NEXT PAGE. 23 24 25 26 27 28

- I am the Principal Hydrogeologist and President/Owner of Earth Forensics, Inc. am an expert in the field of geology, hydrology, hydrogeology, environmental contamination. and contaminated site investigations. I possess extensive knowledge and experience in the areas of hydrogeology, soil and water contamination, water quality, corrective action, hydrology and surface water, site assessment, site investigation, site remediation, wetlands, coastal monitoring/geomorphology, environmental field sampling techniques and well hydraulics, waste management, well environmental remote sensing, aerial photographic interpretation/analysis and geographical information system (GIS). See Appendix A: CV.
- 2. My educational background that relates to this case is as follows: 1997 - Ph.D. in Hydrogeology, Western Michigan University; 1992 - M.S. in Environmental Earth Science. Western Michigan University; 1989 - B.S. in Earth Science, St. Cloud State University, Minnesota.
- 3. I am a licensed Professional Geologist in California, Alaska, Arizona, Illinois, Indiana, Florida, Minnesota, Oregon, Pennsylvania, Texas and Washington. I am also a licensed Professional Hydrogeologist in both California and Washington. I am a Certified Professional Geologist with the American Institute of Professional Geologist as well as Certified Professional geologist for the European Union.
- 4. I am currently an Associate Professor of Hydrogeology in the Department of Geological Sciences, California State University, Fullerton, California. This is a continuation of a career that includes years of teaching, consulting, litigation support and management experience. My course topics encompass hydrogeology, water quality, environmental sampling, groundwater modeling, well hydraulics, remediation technologies, RCRA/CERCLA compliance,

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 meteorology, oceanography, geology, drilling and well construction, field hydrogeology, borehole and surface geophysics.

- 5. I have worked both as a consultant and researcher within the Mojave River area. This includes research conducted for and on the behalf of the Mojave Water Agency, in developing conceptual basin models and both geological and hydrogeological mapping. My work was pursuant to specific assignments and projects, resulting in reports, most of which were grant-funded and related solely to the specific purpose of the study. Additional work was performed for the Agency in determining the groundwater flow between basins and what if any changes had taken place at the time of the studies. This overall research resulted in no less than 16 public reports, 18+ presentations and 12+ theses. Consulting efforts have included the evaluation of blowing sand, mountain front recharge and surface flow as well as specific site evaluations for water resource supply.
- I reviewed the 1996 Judgement after Trial and the following sections and statements are what I believe to be the most relevant to the issues addressed in this declaration.
  - Paragraph 3 Need for a Declaration of Rights and Obligation for Physical Solution Pages 5-7;

"Such Physical Solution requires the definition of the individual rights of all Producers within the Basin Area in a manner which will equitably allocate the natural water supplies and which will provide for equitable sharing of costs for Supplemental Water." Page 6

Paragraph 9 MWA obligations Pages 17-19;

"The Physical Solution is intended to provide for delivery and equitable distribution to the respective Subareas by MWA of the best quality of Supplemental" Page 17

- Paragraph 10 Priority and determination of production rights Pages 19-21;

  "The Declaration of Water Rights that is part of the judgment and the Physical Solution decreed herein takes into consideration the competing priorities which have been asserted in addition to the equitable principles applicable to apportionment of water in this situation." Page 19

  "b. All Producers have contributed to the Overdraft;" Page 20
- Paragraph 11 Exercise of Carry Over Rights Page 21;
   The first water Produced by a Producer during any Year shall be deemed to be an exercise of any Carry Over Right. Page 21
- Paragraph 13 Declaration of Subarea Rights and Obligations Pages 21-22;
   Producers within certain Subareas have rights, as against those in adjoining upstream Subareas, to receive average Annual water supplies and, in any one Year, to receive minimum Annual water supplies equal to the amounts set forth in Exhibit "G", in addition to any Storm Flows
- Paragraph 20: Purpose and Objective;

The Court hereby declares and decrees that the Physical Solution herein contained: 1) is a fair and equitable basis for satisfaction of all water rights in the Mojave Basin Area; 2) is in furtherance of the mandate of the State Constitution and the water policy of the State of California; and 3)

takes into account applicable public trust interests; and therefore adopts and orders the Parties to comply with the Physical Solution.

Paragraph 21: Need for Flexibility;

It is essential that this Physical Solution provide maximum flexibility and adaptability in order that the Court may be free to use existing and future technological, social, institutional and economic options in order to maximize reasonable beneficial use of the waters of the Basin Area. To that end, the Court's retained jurisdiction may be utilized where appropriate, to supplement the Physical Solution.

For a complete list of sited documents see Appendix B.

- 7. I have been asked and retained by Newberry Springs Recreational Lake Association (NSRLA) for the purpose of providing opinions (recommendation) on the following issues affecting the Baja groundwater subarea:
  - a. A detailed water budget for Baja subarea;
  - b. Groundwater production in upstream basins and its effects on the Baja subarea;
  - Surface and groundwater inflows from the Centro subarea to the Baja subarea; and
  - d. Free Production Allowance (FPA) estimates and effects on Mojave Watermaster's decision to ramp-down production in the Baja subarea (Figure 1: Baja Subarea Ramp-down Percentages).
- 8. I am familiar with and have read the public documents and studies related to the Mojave River Adjudication, including the stipulated judgment, the amendments thereto and the

various annual Watermaster Reports. As a result, thereof, I am aware that the various stakeholders of the Mojave River Basin subareas stipulated to the entry of a Judgment in 1998, adjudicating water rights to landowners. The Judgment was implemented to address water supply shortages and a declining groundwater level throughout the various Mojave Basins.

- 9. The procedures to manage the groundwater subareas were first developed by the Mojave Water Agency (Initial Watermaster). This included the evaluation of whether or not the specific groundwater subareas were being over-drafted (water levels going down with time, thus a reduction in overall groundwater storage).
- 10. The adjudicational procedures developed by the Watermaster in my opinion heavily benefit upstream subareas over those downstream. Deficiencies and over simplifications of subarea water budgets are carried downstream to the last subarea, thus Baja is left holding an empty bucket.
- 11. The Mojave River groundwater is divided into five subareas. The Baja subarea is the most downstream basin of the Mojave River that is within the Adjudication.
- 12. In order to maintain water balances (stable groundwater levels) within each subarea, the Judgement establishes a Free Production Allowance (FPA) that can be adjusted depending on the state of the basin. Subareas can pump up to this FPA without having to pay for replacement water. The Production Safe Yield (PSY) for each basin is the amount of water that can be withdrawn from the subarea without significant drop in water levels. The Watermaster calculates both FPA and PSY for each subarea, under the Judgment if the FPA exceeds the PSY by 5% the Watermaster is supposed to provide a recommendation to ramp-down the FPA by a full 5% of the of the aggregate Base Annual Production (BAP) (Watermaster, 2018).

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#### GROUNDWATER ANALYSIS

- 13. The Watermaster has been using groundwater levels as a means of estimating the levels of groundwater basin storage, even though this particular procedure is not specifically called out in nor recommended in the Judgement. The procedure is an indicator of change in groundwater storage but used alone, may not provide accurate data. This negative change in water levels within the groundwater basin is what the Watermaster has been using to determine ramp-down recommendations, which may ultimately result in inconsistent or inequitable rampdown requirements being impose on the various subareas.
- For several years FPA has exceeded PSY by more than 5% in Centro and other 14. upstream subareas, and annual ramp-downs should have been recommended for those subareas, However, groundwater levels have remained relatively stable since the early 1990s and thus storage has remained stable. Most groundwater data in Centro subarea begins in early 1990s, and groundwater levels have remained stable for the most part during this period. Notably, all other subareas are measured in a 60-year period not just from the early 1990's as Centro subarea has been measured. However, if historical data is considered, groundwater levels indicate the Centro subarea has suffered about 25-foot decline since 1960. The outflow numbers currently being used by the Watermaster for Centro to Baja subareas are based upon the 60-year average, which are much higher than current conditions, and thus the number being utilized is seriously inflated when compared to actual water outflow from Centro to Baja subarea.
- 15. The Watermaster's use of groundwater data within the Centro subarea began in the early 1990's to present (~25 years of data). This contrasts with evaluating the water levels within the Centro subarea to much early data (pre-1950s) that places the groundwater levels within the subarea, some 25 feet higher than in the 1990s. Again, notably, all other subareas

have been measured from the earlier dates. In essence, Centro subarea's data compared to the other subareas is like comparing apples to oranges and not apples to apples.

- 16. In the 2016-17 water year, Centro subarea's FPA exceeded the PSY by 15.2% and no ramp-down was recommended (Watermaster 2018). In the same water year, Este and Oeste subareas FPA exceeded the PSY by 45.6% and 23.6% respectively and no ramp-down was recommended. If upper groundwater subareas in the Mojave River area were ramped down according as the Judgment called out for more underflow (groundwater) would have reached the Baja subarea. By not following the stipulations within the Judgment for ramp-down within the upper subareas has thus caused damage to the Baja subarea. As calculated in the 2016-17 annual water master report, this has resulted in the loss of 408,000 acre-feet (AF) of water to the Baja subarea over the life of the adjudication or 18,545 acre-feet annually (AFY) (Watermaster 2018).
- 17. In simpler words, Centro subarea is like a bathtub, and is expected, when filled to the required brim, to spillover water which then flows into the Baja subarea. The adjudication put Centro's "brim", some 25 feet lower than other comparable subarea. Thus, Centro subarea will never meet the projected outflow to the Baja subarea, because the water in the current bathtub will never reach spillover levels using the 1990 numbers. The lowered brim creates the illusion of Centro subarea being in balance and sending the required outflow to the Baja subarea, when in fact, the water never spills over to flow downstream, resulting in the loss of subsurface flow that should have flowed annually to the Baja subarea.

#### RAMP-DOWN NEEDS

18. Groundwater modeling by the United States Geological Survey (USGS) has shown that groundwater pumping in upstream subareas has a substantial impact on storage

downstream in the Baja subarea. The USGS team, headed by Stamos et al., modeled this in 2001 (Stamos et al., 2001) and Todd Engineering discuss this in their Conceptual Hydrologic Model Report on Page 5-30 and 5-31 (Todd, 2013). Todd Engineering state the following:

"Based on simulations with the USGS model, upper basin pumping (not including Centro) was estimated to account for about 21 percent of groundwater lost from storage in the Baja Subarea over the base period (1931 to 1990). The USGS did not simulate the effect of upstream pumping in Centro on stream discharge and recharge in Baja."

- 19. Ramping down groundwater production within the Baja subarea without first ramping down other upstream subareas will have minimal effect on stabilizing the overdraft conditions being observed within the Baja subarea. In all fairness, the upstream subareas already have PSY that is exceeding the FPA, thus should be ramped down **FIRST**.
- 20. Since 1993, the average verified production in the Baja subarea has been approximately 32,000 AFY. On average about 13,500 AFY has been annually recharged into the Baja subarea. On average during the same time frame the basin has lost about 18,500 AFY (Watermaster, 2018, Para. 15 & 16 of this declaration).
- 21. Due to current ramp-downs, the recent verified production has decreased to 23,691 AF for the 2016-2017 water year in the Baja subarea as it strives to remain in compliance with the Judgment. Even with the existing ramp-down during the 2016-2017 water year, the Watermaster has calculated an additional storage loss of 23,600 AF to the Baja subarea (Watermaster, 2017 and Watermaster, 2018).

#### SURFACE WATER FLOW

22. The values used by the Watermaster to estimate the PSY are in my opinion an overestimation. The largest unverified input is surface water inflow from the Centro subarea to

the Baja subarea. Currently, the Watermaster uses 16,406 AFY (average inflow 1931-1990) as inflow into the subarea, however when actual surface flow records from the USGS stream gage are used, only approximately 7,158 AFY of flow exists since the 1993-94 water year. This has led to an over estimation of inflow (recharge) of about 9,000 AFY. Since this value is tied to the PSY, this overestimation has led to further overdraft of the Baja subarea.

23. The 9,000 AFY surface flow deficiency is a function of the period and magnitude of storm events that generate enough flow to reach the Baja subarea (see Figure 2: Barstow Gage Flow). The historical stream flow records indicated about a 10 to 13-year reoccurrence between significant recharge events. The last significant recharge event where large amounts flowed into Baja subarea occurred in the 2004-2005 water year. Surface water flows into the subarea are not affected nor tied to groundwater production in the Baja subarea. It is however tied to upstream production in the up-gradient subareas (Stamos et al., 2001) and groundwater levels within the Centro subarea. The total equivalent storage loss since 1993 due to unrealized surface water flows into the Baja subarea are 225,000 AF.

### Water Budget and Ramp-down Analysis (without Afton Canyon)

- 24. Using the USGS estimate of 21% loss of storage due to upstream pumping, we calculate a loss of 92,750 AF for the 25 years since 1993-94 water year or 3,710 AFY. This unaccounted overdraft is based on loss of storage during the base period (1931-1990) and projected forward into the adjudication period. These losses were unaccounted for in the Watermaster initial calculations.
- 25. To summarize due to the historical distribution of storm events that lead to storm flows that ultimately flow into the Baja subarea and the overestimated calculation by the Watermaster of about 225,000 AF of flow have not been realized and thus have contributed to

the basin overdraft. Additionally, the Watermaster did not consider effects of pumping in upgradient subareas which as the USGS modeled were contributing to a 21% loss of storage during the base period (1931-1990). This was not even recognized by the Watermaster until the publishing of the USGS model and Todd Engineers report of 2013 report. To date, this has not been evaluated nor included in the Watermaster's calculations for water budgets. This storage loss which was occurring during the base period and has continued into the Judgment period.

- 26. Beginning in 1993-94 water year through 2016-2017 water year, I estimate an average annual inflow into Baja subarea of 9,044 AF. This is based on the following (see Table 1a):
  - a) Averaged inflow (Mojave river flow) across the Waterman Fault of 7,158 AF (Para. 22 of this declaration);
  - b) Additional inflow estimates taken from Table 5-2 from 2016-17 Watermaster Annual report for surface water inflow (other ungagged), subsurface inflow, and deep percolation of precipitation, totaling of 1,886 AF; and,
  - c) If NO additional rainfall the averaged inflow will continue to decrease until a recharge event (significant enough rainfall event to produce surface water flow into Baja subarea).
- 27. I calculated an additional unrealized potential input totaling 8,564 AFY after taking into account that a large recharge events occur on average every 11 to 13-years (Table 1a). The calculated values are based on the following;
  - a. A total 4,854 AFY of potential input from a large recharge event is anticipated based on the reoccurrence of large recharge events of 10 to13years. Historically, the large recharge events occurred in the following

water years; 1968-69, 1979-80, 1992-93, 2004-05). Prior to 1968, there had been a drought and a relative wet period extending back to 1930's. To be conservative, only the most recent data from 1968 on was used. This included only the four large events that were averaged. As soon as a recharge event occurs this value will remain constant and can be applied over the following 15-years as the water budget input or until the next subsequent large recharge event occurs. These values do not account for any loss to Afton Canyon.

- b. As discussed in (Para. 24 of this declaration), a 92,750 AF loss has occurred since the Judgment solely due to pumping in up-gradient subareas. This equates to an annual loss of 3,710 AFY which should be replenished.
- 28. Water Budget Summarized Findings (not including any losses to Afton Canyon).
  - a. Based upon the average annual recharge, plus the unrealized potential excess surface water and replaced water from up-gradient pumpers; the following annual budget was calculated to be approximately, 16,374 to 17,608 AFY, depending on when the recharge event occurs, and upgradient pumping losses replaced;
  - b. Table 1b is a summary of several ramp-down scenarios and tabulates ramp-down FPA that:
    - i. are be below the total recharge or "sustainable",
    - ii. exceed total recharge or in "overdraft";

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d. The difference between the verified production (groundwater pumping) and annual recharge is approximately 6,000 to 7,000 AFY, which can be

c. Verified pumping in 2016-17 was 23,691 and 2017-2018 should be lower

potentially made-up with the solutions provided below.

# (Water Budget and Ramp-down Analysis (including Afton Canyon)

depending on carryover use; and,

- 29. Beginning in 1993-94 water year through 2016-2017 water year, I estimate an average annual inflow into the Baja subarea of 9,044 AF (see Table 2a). See Para 26 in this declaration.
- 30. I calculated an additional unrealized potential input totaling 8,887 AFY by taking into account that a large recharge events occur on average every 11 to 13-years and that the Baja subarea has been subjected to a storage loss of 3,710 AFY due to pumping in other subareas and should be replenished (see para 24 for details) (Table 2a). The calculated values are based on the following;
  - a. Larger than expected recharge events have previously occurred. As soon as a recharge event occurs this value will remain constant and can be applied over the following 15-years or until the next subsequent large recharge event;
  - b. During these larger than expected recharge events the average flow into the Baja subarea was approximately, 133,305 AF. The average total surface outflow to Afton Canyon was approximately, 62,663 AF during these events. Leaving a total of 70,642 AF flows for recharge into the Baja subarea. Based upon the Judgement, an annual flow of only 400

AFY is required to flow to Afton Canyon. This leaves an opportunity to help the Baja subarea, by better managing the excess surface water flow as it comes through the subarea. Meaning, that approximately, 56,000 AF could be recharged into the Baja subarea, rather than be lost downstream to Afton Canyon. Several examples of how this can be done are; along the Mojave River employ several detention basins, rubber dams or other mechanisms to allow rapid infiltration into the subsurface. This lost discharges to Afton Canyon along with what would have been recharged naturally, equates to approximately, 8,887 AFY averaged annual recharge over a 15-year period;

- c. This additional unrealized recharge could be used to offset the declining groundwater levels within the Baja subarea and thus decrease the existing overdraft. This brings the basin closer to being into a sustainable system; and,
- d. As discussed in (Para. 24 of this declaration) 92,750 AF loss since the Judgment due to pumping in upgrading subareas. This equates to an annual loss of 3,710 AFY, which should be replenished by the up-gradient pumpers.
- Water Budget Summarized Findings (including recharge potential which is currently lost to Afton Canyon).
  - a. Baja subarea captures the excess surface low of 56,000 AF, rather than allowing it to flow out to Afton Canyon.

- b. Based upon the average annual recharge, plus the unrealized potential excess surface water and replaced water from up-gradient pumpers; the following annual budget was calculated to be approximately, 20,407 to 21,641 AFY, depending on when the recharge event occurs, and upgradient pumping losses replaced;
- Verified pumping in 2016-17 was 23,691 and 2017-2018 should be lower depending on carryover use;
- d. Table 1b is a summary of several ramp-down scenarios and tabulates ramp-down FPA that:
  - i. are be below the total recharge or "sustainable";
  - ii. exceed total recharge or in "overdraft", and
- e. The difference between the verified production (groundwater pumping) and annual recharge is approximately, 2,000 to 3,000 AFY, which can be potentially be made-up with the solutions provided below.

## POTENTIAL MITIGATION

- 32. In my professional opinion other solutions need to be considered in order to minimize the overdraft in the Baja subarea and mitigate some of the inequitable assessments that currently affect the Baja subarea. Such solutions that should be considered are:
  - a. Ramp-down of upstream subareas that have been exceeding the FPA or increase artificial recharge to account for this loss due to upstream groundwater production which has been benefiting upstream subareas since implementation of Judgement.

- b. Provide make-up water for the historical loss of groundwater to the Baja subarea due to upstream users. Over the past 25 years since the Judgement, upstream water users have short-changed the Baja subarea some 92,750 AF. If this water is made-up for by providing recharge waters to the Baja subarea, this will help offset the existing overdraft.
- c. Differential ramp-down rates on water use types (municipal, agriculture, domestic, etc.) within the subarea, could have a greater effect on groundwater production than that of a single rate ramp-down for all users. Production values in Appendix B of the Watermaster's 2016-2017 annual report (Watermaster, 2018) and Mojave Basin Watermaster Owners Address List Baja of 2018 (MWA, 2018). Based upon the last documented water year agriculture users accounted for 67 percent of allotted BAP and 80 percent of the total groundwater production. It is obvious that ramping down the agriculture users more than that of others will generate the greatest impacts to the overall subarea water budget. This would also have the least effect on domestic and recreational lake users. Differential ramp-downs are currently being implemented within the Alto and Oeste subareas (Watermaster 2018, page 35).
- d. In order to capture and recharge the excess water the currently flows to Afton Canyon during large events the following are examples of how this can have achieved
  - i. employ detention basins along the Mojave river
  - ii. employ rubber dams or

- iii. other mechanisms to allow rapid infiltration into the subsurface.
- iv. Elimination of tamarisk upstream of Baja Subarea
- v. Reevaluate all upstream barriers to surface water flow to the Baja subarea – including potential upstream channelization
- vi. Install flow meters on all Baja subarea producers
- vii. Wastewater reuse
- Limits or ramp-down on carryover rights needs to be addressed, Carryover transfers should generally not be allowed. Carryover should at a minimum stay with the property for which it originates. I believe that this was generally addressed previously by Judge Kaiser in December of 2005 (City of Barstow et al. v City of Adelanto et al.), "Carryover may be used on the land(s) where it originates, only by the current producer. Carryover can be accrued for two years. All existing and current producers of recirculated water (referred to as the "Recreational Lakes), in the Baja Subarea as defined in the Judgement and identified ...... shall continue to have the right under Paragraph 34 of the Judgement and Exhibit "F" of the Judgement to purchase any Carryover Right or portion thereof to Recreational Lakes as provided in the Judgement." Another aspect of carryover rights to be reconsidered is in which order the carryover allotments need to be applied; currently carryover rights are applied first prior to the current years allotment. It would be reasonable to reverse this to allow for current year allotment to be consumed prior to any carryover right being used.

## CONCLUDING REMARKS

In 2001, the USGS stated that "Overall, pumping in the lower region does not negatively affect the upper region: however, pumping in the upper region negatively affects the lower region by decreasing recharge from the Mojave River." (Stamos et al., 2001). This also extends to any FPA ramp-down; ramp-down in the Baja subarea has no impact on upgradient subareas. However, any and all ramp downs of upgradient subareas or lack thereof has a direct impact on the Baja subarea. Any deficiencies in water budget calculations (i.e. FPA, PSY) in upgradient subareas will be propagated downgradient.

This declaration sets forth my opinions and the information upon which I relied.

I declare under penalty of perjury of the laws of the State of California that the foregoing is true and correct and that I have executed this declaration on the 28<sup>th</sup> day of September 2018, at Santa Ana, California.

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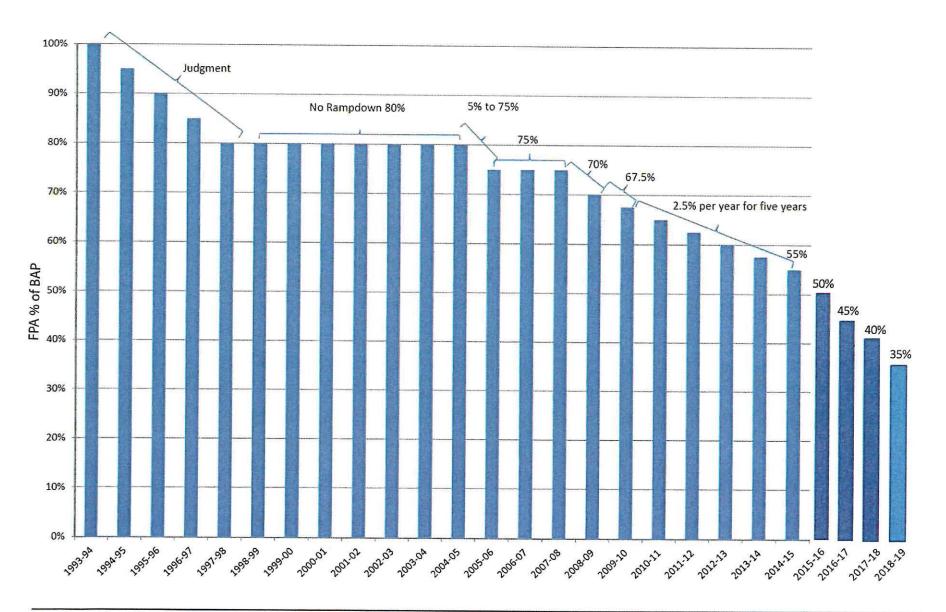
Dr. W. Richard Laton, PG, CHg President of Earth Forensics, Inc. Principal Consultant, Hydrogeology By Fax – Cal. Rules of Court, Rule 2.304

## Appendix B- References Cited

- Mojave Water Agency (MWA), 2018. Mojave Basin Area Watermaster owners address list.

  Acquired September 26, 2018.
- Riverside County Superior Court, 1996. Judgment after trial- Mojave Basin Area adjudication.

  City of Barstow, et. Al v. City of Adelanto, et al. January 10.
- Stamos, C.L., et al., 2001. Simulation of ground-water flow in the Mojave River Basin, California. U.S. Geological Survey.
- Todd Engineers (Todd), 2013. Conceptual hydrogeologic model and assessment of water supply and demand for the Centro and Baja management subareas Mojave River Groundwater Basin. July.
- Watermaster, 2017. Twenty-third annual report of the Mojave Basin Area Watermaster for water year 2015-16. May 1.
- Watermaster, 2018. Twenty-fourth annual report of the Mojave Basin Area Watermaster for water year 2016-2017. May 1.



Gearthforensics, inc.

Figure 1: Baja Subarea Rampdown Percentages

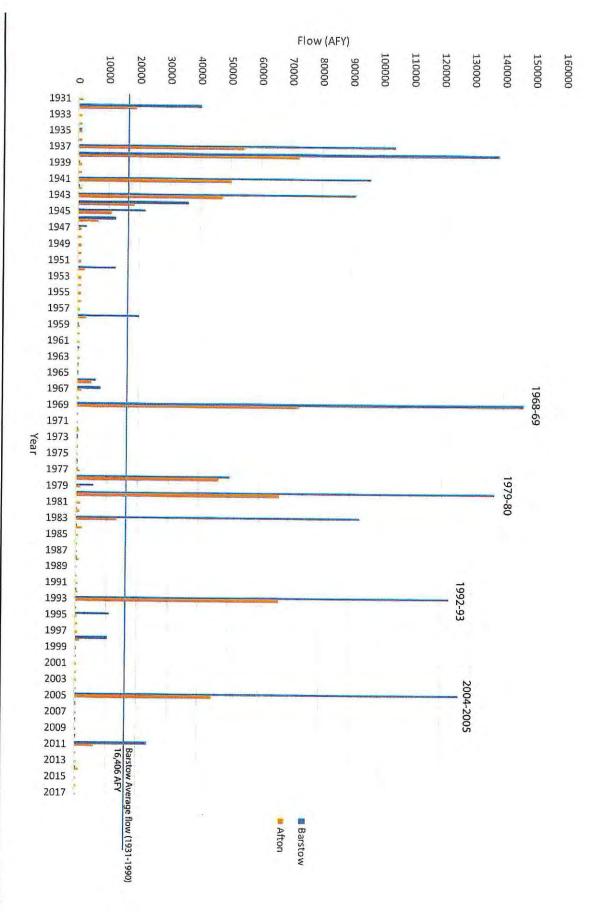


Figure 2: Barstow Gage Flow



# W. RICHARD LATON, Ph.D.

12532 VISTA PANORAMA NORTH TUSTIN, CA 92705 714-296-4055; 714-771-2620 fax wlaton@earthforensics.com

#### VITAE

#### **EDUCATION**

Ph.D. (1997), Geology with an emphasis in Hydrogeology, Western Michigan University

Groundwater - Kalamazoo River Interaction near the Parchment City Well Field, Parchment,

Michigan.

M.S. (1992), Environmental Earth Science (Coastal Geomorphology), Western Michigan University Small-Scale Coastal Cells as Control Mechanisms on Sediment Movement; Identification and Mapping.

B.S. (1989), Earth Science (Oceanography), Saint Cloud State University, Minnesota Density Flow Analysis of Turbidity Currents.

## PROFESSIONAL SUMMARY

Dr. Laton is an expert in the field of geology/hydrology/hydrogeology. He is currently an Associate Professor of Hydrogeology in the Department of Geological Sciences, California State University, Fullerton and the prestigious 2014 Ross Oliver award winner. This is a continuation of a career that includes years of teaching, consulting, litigation support and management experience. Dr. Laton possesses extensive knowledge in the areas of hydrogeology, soil and water contamination, hydrology and surface water, wetlands, coastal monitoring/geomorphology, field sampling techniques and well hydraulics-well design as well as environmental remote sensing/GIS. His classes at the university encompass topics including: water quality, environmental sampling, groundwater modeling, well hydraulics, oceanography, and basic geology. He enjoys introducing students to applied research and acts as the faculty advisor to a large number of upper-level students. He has also acted as a consultant for a numerous companies and agencies that need input on the above subjects as well as natural hazard assessment and mapping.

## CERTIFICATIONS

California Professional Geologist	(PG-7098)	California Professional Hydrogeologist	(CHg-958)
Alaska Professional Geologist	(PG-673)	Pennsylvania Professional Geologist	(PG-5095)
Arizona Professional Geologist	(PG-42253)	Texas Professional Geologist	(PG-10018)
Florida Professional Geologist	(PG-2618)	Washington Professional Geologist	(PG-2517)
Illinois Professional Geologist	(196.001370)	Washington Professional Hydrogeologist (CHg-2517)	
Indiana Professional Geologist	(LPG-2191)	POLICE PRODUCES	
Minnesota Professional Geologis	t (PG-44868)	AIPG-Certified Professional Geologist	(CPG-10544)
Oregon Professional Geologist	(G2153)	European Geologist	(N-1128)

## SELECTED CONSULTING, RESEARCH, AND EMPLOYMENT EXPERIENCE

#### **Professional Profile**

2010 - Present, President of Earth Forensics Inc.

1995 - 2010, Partner (Owner Operator) with Environmental Science & Planning, LLC.

1998 - 2001 & 2007 - 2012, Senior Consultant with Earth Consultants International.

2001 - 2007, Consultant to Hromadka & Associates.

1996 - 1998, Senior Hydrogeologist with SimulProbe Technologies.

## 2010 - Present. Earth Forensics, Inc. President (www.earthforensics.com)

Project experience includes project management, expert testimony, field work and oversight and training. Clients have included the State of California, various cities, private firms and other consulting companies. 2018

- · Portland, OR. Retained as an expert associated with a landslide.
- · Los Osos, CA. Hired to develop a RAP associated with BTEX contamination.
- New Mexico. Retained as an expert associated with field drilling operations and well design.
- Houston, TX. Retained as an expert associated with flood damages from Hurricane Harvey (hydrology and meteorology (Plaintiff).
- Huntington Beach, CA. Retained as an expert on PCE contamination; fate and transport associated with a dry-cleaner (<u>Defense Chan Property v Misak Olgun et al, Case No 30-2018-00984600-CU-PO-CJC</u>).
- Torrance, CA. Retained as an expert on the fate and transport of contamination emanating from refinery operations. Included Declaration and Deposition. (Plaintiff - Goldstein v Exxon Mobil, et al. Case No 2:17-cv-02477-DSF (SKx).
- Malibu, CA. Hired to perform assessment of potential single-residence groundwater well.
- Los Angeles, CA. Hired to perform Phase II site assessment. Former Dry Cleaners.
- Santa Barbra, CA. Retained as an expert on PCE contamination; fate and transport (Plaintiff).
- Pomona, CA. Retained as a rebuttal expert to provide opinions on hydrogeology, contaminant sources (perchlorate), and historical fertilizer use. Re-Trial. Included Expert Rebuttal Report and Deposition. (Defense - City of Pomona v. SQM North America Corporation - Federal Court)
- Whittier, CA. Hired to review Phase II associated with both residential and commercial property.

- San Diego, CA. Retained as expert in hydrology and meteorology (<u>Defense Anderson et al v</u> <u>Cortez et al, Case No 37-2016-00004134-CU-BC-CTL).</u>
- Roxboro, NC. Retained as expert in hydrology, hydrogeology and geology. Expert Reports and Deposition (<u>Defense - Roanoke River Basin Association v Duke Energy Progress, LLC Case No</u> 1:16-cv-607 and No 1:17-cv-452)
- Inglewood, CA. Retained to review soil contaminated with arsenic, potential sources.
- · Torrance, CA. Hired to review soil, water and soil gas contaminant history of refinery.
- · Bakersfield, CA. Hired to review water quality on bottled water plant.
- · Santa Barbara, CA. Hired to review contaminant history of former dry cleaner facility.
- · Glendale, CA. Hired to perform background research on dry cleaner facility.
- · San Jose, CA. Hired to perform Phase II site investigation.
- Bishop, CA. Retained as expert on hydrology and hydrogeology in relation to Round Fire.
- Thousand Palms, CA. Retained as expert on hydrology and geomorphology. (<u>Defense</u> Hernandez vs. Huth et. al. Case No PSC 1501365)

- Indiana. Retained as expert on well drilling, abandonment and geothermal wells. Includes Expert
  Report and Deposition. (Defense Salomon, et. al. vs. Mark Scott Construction, et. al. Case No
  2:15-cv-464)
- Moraga, CA. Hired to review Phase II Soil Vapor Site Investigation.
- · Long Beach, CA. Hired to review Phase II soil and soil vapor site investigation.
- Huntington Beach, CA. Retained as expert on PCE fate and transport. Deposition (Defense 17892 Jamestown, et. al. vs. Goldenwest Laundry, et. al. Case No. 30-2014-00705041-CU-NP-CJC)
- City of Industry, CA. Hired to determine dewatering options, calculate volumes and review disposal options.
- · Lafayette, CA. Hired to review Soil and Groundwater Management Plan.

- San Jose, CA. Hired to review and perform site investigation in association with PCE.
- · Los Angeles, CA. Hired to develop soil and groundwater sampling plans for CalTrans.
- · Malibu, CA. Hired to review groundwater withdrawal impacts on local stream,
- Malibu, CA. Hired to develop and survey several groundwater monitoring wells.
- Malibu, CA. Hired to oversee pilot drill holes for City water injection program.
- · Anaheim, CA. Hired to review RI/FS of former dry-cleaning facility.
- Santa Barbra, CA. Retained as expert on PCE contamination fate and transport. Includes Expert Report, Rebuttal Report and Deposition. (<u>Defense – Goldberg, et. al. vs. Goss-Jewett Company, et. al. Case No. EDCV 14-1872DSF</u>)
- Malibu, CA. Hired to install several monitoring wells and to rehabilitate an existing well.

#### 2015

- Denver, CO. Retained as expert on water wells and hydraulic fracturing. Includes Expert Report, Rebuttal Report and Deposition. (Defense - Hydro vs. Denver Southeast Suburban Water and Sanitation District et. al. Case No. 201CV30849)
- Orange County, CA. Retained as expert on groundwater. Includes Deposition. (Defense Kirk et. al. v Varco, et al. Case No. 30-2010-00423097)
- Orange County, CA. Hired to review South Coast Water District Desalination Program, specifically the slant intake wells.
- · Malibu, CA. Hired to oversee groundwater issues associated with landslide.
- Malibu, CA. Hired to install several groundwater monitoring wells in association with WDR permit.
- Los Angeles, County, CA. Retained to provide expert testimony in regard to well abandonment.
   (Defense Golden State Water Company v. General Pump, et. al.)
- Los Angeles, County, CA. Retained to provide expert geology and hydrogeology testimony.
   (Defense C. Donald Albin, et al. v. David Leu, et al. County of Los Angeles Case No. TC027060)
- Los Angeles, County, CA. EIR review and comments for wastewater plant and disposal.

- Northern California. Phase II Site Investigation.
- Los Angeles, County, CA. Retained to provide expert rebuttal testimony on regional hydrogeology. Included Expert Rebuttal Report. (<u>Defense - City of Cerritos et al. vs Water</u> <u>Replenishment District of Southern California. - Case No. BS128136</u>)
- Los Angeles, CA. Hired to collect both seepage water and treated effluent waters.
- Loma Linda, CA. Retained to provide expert opinion on meteorological analysis (Plaintiff SoCal Self-Storage – Loma Linda v. City of Loma Linda, et. al. – Case No. CIVDS 1200111)
- Los Angeles, CA. Hired to review multiple potential responsible parties' case files for Los Angeles Department of Power and Water.

- Malibu, CA. Hired to abandon multiple groundwater monitoring wells.
- San Diego, CA. Retained to provide expert testimony on surface water hydrology, geomorphology and meteorological analysis. (<u>Defense – Jaffe v. Bradshaw and others. – Case</u> No. 37-2011-00055925-CU-PO-NC)

- · Lancaster, CA. Hired to peer-review a groundwater model and subsidence issues.
- · Malibu, CA. Hired to review wastewater treatment options.
- Malibu, CA. Hired to review and reply to EIR comments as they pertain to wastewater discharge and hydrology, hydrogeology and geology.
- Olivenhain Municipal Water District, CA. Hired to evaluate groundwater resources. Conceptual Water Resource Evaluation.

#### 2012

- Torrance, CA. Retained to provide expert testimony on groundwater seepage. (<u>Defense Torrance Matrix Center Property Owners Association v. Headlands Realty Corporation, et al. Case No. BC462023)</u>
- Duncan, OK. Retained to provide expert testimony on fate and transport of perchlorate and other
  contaminants of concern, geology and hydrogeology. Included Expert Reports, Depositions and
  Mediation Conferences. (Plaintiff Alexander, et al. v. Halliburton Company, et al., No. 5:11-cv01343-M)
- North Central Texas. Hired to evaluate possible causation of potable water well failures.
- San Francisco, CA. Conducted evaluation of contaminated soils for CalTrans.
- Malibu, CA. Hired to conduct groundwater investigation and model of wastewater discharge into
  the subsurface. Includes the evaluation of ASR wells and groundwater-sea water interaction.
  Includes the development of both groundwater and surface water sampling protocols for longterm monitoring.
- Malibu, CA. Hired to conduct groundwater investigation for wastewater treatment system upgrade on single family residence.
- Fennville, MI. Retained to provide expert testimony on fate and transport of contaminants of concern, geology and hydrogeology. Included Expert Report and Deposition. (Plaintiff - Barnes, et al. v. Birds Eve Foods - Case No. 1:10-cv-541)
- San Nicolas Island, CA. Developed white paper on the feasibility of deep-well injection of brine.
- Long Beach, CA. Developed calculations of dewatering operations for Gerald Desmond Bridge Replacement Project.
- Malibu, CA. Hired to conduct quarterly and annual groundwater and effluent sampling of commercial property.

- Orange County, CA. Retained to provide expert testimony on hydrogeology, TCE/PCE and perchlorate contaminant sources and remediation. Included Deposition. (<u>Defense - Orange</u> County Water District v. Sabic Innovative Plastics - Case No. 30-2008-00078246-CU-TT-CXC)
- Parker Dam, CA. Semi-Annual Groundwater Reporting to Bureau of Land Management.
- Baldwin Park, CA. Hired to oversee soil and groundwater sampling for CalTrans freeway expansion in association with FlatIron Corp. included both environmental and geotechnical sampling.
- Pomona, CA. Retained as a rebuttal expert to provide opinions on hydrogeology, contaminant sources (perchlorate), and historical fertilizer use. Included Expert Rebuttal Report and Trial Testimony. (Defense - City of Pomona v. SQM North America Corporation - Federal Court)
- Malibu, CA. Retained and hired to evaluate groundwater conditions of a landslide area in association with geotechnical mitigation. Included overseeing groundwater monitoring, drilling of monitoring wells and meteorological assessment. Included Mediation. (Defense)

- Laguna Beach, CA. Hired to photo-document cave collapse.
- Baldwin Park, CA. Hired to evaluate the soil contamination of several stockpiles in association with FlatIron Corp. road construction.
- Malibu, CA. Hired to evaluate and construct artificial recharge wells in association with City wastewater system. Included drilling of test wells, aquifer testing and water chemistry.
- San Jose, CA. Aid in development of construction proposal for FlatIron Corp.
- · Riverside County, CA. Review of ADL reports for SEMA Construction Corp.
- Fullerton, CA. Retained to provide expert testimony on contamination source and remedial alternatives. (Plaintiff- M&H Realty Partners v. Aerojet-General Corp et al. – State Court)
- Los Angeles County, CA. Provided Hydrogeologic evaluation of landslide impacted area.
- City of Los Angeles and Riverside County, CA. ADL Reports for CalTrans.

- Carson, CA. Provided review of contaminated soil data and sampling plan for hydrocarbon investigation.
- Fresno, CA. Wastewater sampling at National Raisin Plant. Provide consulting services on wastewater reuse.
- Pleasant Hill, CA. Retained to provide expert assessment of BTEX/MTBE. Included Declaration. (Plaintiff)
- · Victorville, CA. Hired to provide background information on Desert Knolls Wash.
- Placer County, CA. Retained to provide hydrogeological assessment of production well and its impact on neighboring domestic wells.
- Merced, CA. Retained as designated expert for Chromium VI contamination case. Work
  included providing hydrogeological analysis and guidance. Included Declarations, Expert
  Reports, Deposition and Trial Testimony. (Plaintiff Abarca, et. Al. v. Merck-Federal Court)

## 1995 - 2010. Environmental Science & Planning, LLC. Partner (Owner Operator).

Project experience includes management, expert testimony, field work, bid preparation and consulting for public agencies as well as private companies in the areas of remediation, water resource evaluations, geophysical investigations, surface water management, sampling, and modeling. Selected consulting as follows:

#### 2008

- Torrance, CA. Provided expert analysis of Dry Cleaner facility for commercial property.
- · Long Beach, CA. Aided in developing conceptual model of manufacturing facility.
- Provide technical oversight and alternatives for San Bernardino County Flood Control.
- Orange County, CA. Retained as designated expert on single family home in association with potential water issues. (<u>Defense</u>)
- San Bernardino County, CA. Provided consulting services in relation to water supply to area of single family residences.
- Signal Hill, CA. Provided expert analysis of downhole video of suspected drain.

- La Jolla, CA. Retained as designated expert on surface and groundwater issues related to landslide, (Plaintiff)
- Long Beach, CA. Retained as designated expert on surface and groundwater issues surrounding a
  coastal condominium complex. (Plaintiff)
- Norco, CA. Provide expert oversight to Wildermuth Environmental, Inc., on surface water and groundwater sampling protocols and training.

- Riverside, CA. Environmental Impact Report. Provided technical support on land development associated with an old mining claim.
- Irvine, CA. Environmental Engineering and Contracting. Provided support and review of CPT, ROST data for environmental contamination project in the state of Illinois.

#### 2005

- Malibu, CA. Retained as designated expert for hydrogeologic analysis of existing wastewater system. Included Deposition. (<u>Defense</u>)
- Riverside, CA. Oversaw specialized soil and groundwater sampling for Layne Christenson.

#### 2004

- · Oakland, CA. Soil and groundwater sampling for CalTrans.
- California. Statistical analysis of lead in soil samples for CalTrans highway expansion.
- Carpenteria, CA. Retained as wetland expert, included HEC-RAS modeling.

#### 2002

 Playa Vista, CA. Developed methane mitigation plan for residential and commercial development.

## 1999 - 2000

- Norco, CA. Oversaw development of methane sampling and mitigation standards for Riverside California.
- Norco/Corona, CA. Methane Mitigation Investigation.
- Long Beach, CA. Carlin Environmental Consulting. Soil and groundwater sampling.

#### 1997

- Kalamazoo, MI. Worked with United Environmental Technologies, Inc. to help develop sampling and well construction protocols for various projects.
- 1998 2001 & 2007 2012. Earth Consultants International, Inc. Senior Consultant (www.earthconsultants.com) Work includes project management and project hydrogeologist duties. Other activities include business development and marketing. Projects include wastewater, oil field seepage and methane mitigation, dewatering for construction purposes, EIR development, water resources investigations, watershed studies, and a regional groundwater GIS study for Riverside County.
  - Ocotillo/Coyote Wells. Retained to review groundwater basin conditions in association with Wind Zero development. (<u>Testimony on behalf of client - Imperial County</u>)

## 1998 - Present: City of Malibu Specific Projects

- Retained to provide hydrogeologic services in association with a zero-discharge wastewater system. Aided in Salt Management Plan.
- Retained to provide hydrogeologic services in association with on-site wastewater, Miramar Investment Co.
- Retained to provide consulting services associated with wastewater discharge impacts to the subsurface at Malibu Racquet Club, Casa Malibu Inn, Wavebreak Restaurant and Malibu Cantina Restaurant. (Testimony on behalf of Client – LARWQCB)
- Retained by the City of Malibu to represent them in surface water lawsuit. (Defense Settled)
- Oceanographic-Hydrogeological analysis and modeling of tidal fluctuations, storm surge and impacts to a coastal developments wastewater discharge system.
- Conducted regional groundwater study for the City of Malibu associated with a groundwater flow model of the downtown area. Includes field work, data analysis and modeling support. (Testimony on behalf of Client – LARWQCB)

- Provided expert testimony for City of Malibu on local groundwater conditions. (<u>Testimony</u> on behalf of Client <u>LARWQCB</u>)
- Hydrogeological Characterization and modeling of subsurface wastewater discharge (mounding) - Crummer Property, Malibu, California.
- Hydrogeological Characterization and modeling of subsurface wastewater discharge (mounding) – Winter Canyon, Malibu California.
- Hydrogeologic Characterization and testimony to wastewater discharge to subsurface Malibu, California. (<u>Testimony on behalf of Client – LARWQCB</u>)
- Hydrogeologic Characterization and Assessment of Impacts of Wastewater Discharge for proposed wastewater treatment facility in downtown Malibu. (<u>Testimony on behalf of Client</u> <u>- LARWQCB</u>)
- Hydrogeologic Characterization and Assessment of Impacts of Wastewater Discharge for Proposed Construction of Thirteen Single-Family Residences in Trancas Canyon, Malibu, California.
- Groundwater study of Winter Canyon, Malibu, California for the purpose of determining the feasibility of using the canyon for wastewater disposal.
- Groundwater study of 200 acres in preparing the Malibu Civic Center EIR.
- · Provide expert witness testimony on sewer seepage and geology for the City of Malibu.

Developed Safety Elements for Newport Beach, Brea, Glendale, and Pasadena.

2000

Los Angeles, CA. Playa Vista Corporation — Groundwater and Methane Migration Investigation on Playa Vista Property. (Testimony on behalf of Client — City of Los Angeles)

1999

- Safety Element of the General Plan, Riverside County.
- Orange, CA. Environmental Impact Report Geologic, Seismic and Hydrologic Sections of the Environmental Impact Report for the Proposed Sully-Miller Fieldstone Project.
- Brea, CA. Feasibility investigation to review mitigation options for active crude oil seeps (tar) and methane generation.

#### 2001-2007. Hromadka & Associates. Consultant

Provided litigation support, computer and physical modeling, expert report reviews and writing along with managing multiple cases and field-site inspections for the company.

2006

- San Diego, CA. PCB transport in San Diego Bay.
- San Francisco, CA. Physical model of apartment complex combined sewer and storm drain network.
- · San Francisco, CA. Severe rainfall analysis in four events, flooding.

- Yorba Linda, CA. Analysis of sediment transport from large grading project and nursery debris
  production at school site.
- Irvine, CA. Groundwater uplift analysis of clogged filter fabric in flexible lining and sediment transport in San Diego Creek in 2-mile reach using flexible block lining.
- Torrance, CA. Sediment transport in Compton Creek downstream of Montrose Plant. Transport analysis of sediment in major/minor events.
- Development of Volume Based BMP design procedure for San Bernardino County WQMP.
- Multi-lake hydrologic and water quality analysis at Lake Merced, California. Phosphates, nitrates, golf courses, coliform in groundwater, flood control and risk reduction. Tunnel flow capacity analysis. Hydrologic balance analysis.

- · Santa Rosa, CA. Transport and fate of TCE, PCE in surface water.
- Anaheim Hill, CA. Soil water transport and ET studies for several hundred residences. Water balance studies.
- Fullerton, CA. Soil water transport and ET studies for several dozen residences. Soil water flux in concrete.
- San Clemente, CA. Soil water transport and hydrologic balance analysis near landslides.
- Castaic Lake, CA. Soil water transport and hydrologic balance analysis of residential tract.
- Oahu, HI. Groundwater plume transport, analysis of BTEX in rising groundwater and tidal effects.
- Daly City and San Francisco, CA. Flooding and tunnel capacity analysis.

- Tehachapi, CA. Analysis of TDS, cement Kiln dust, chlorinated hydrocarbons, BTEX, TCA, TCE, DCA, and DCE, groundwater flow in fractured and faulted media.
- Irvine, CA. Groundwater hydrostatic pressure analysis, waterproofing of office center.
- Laguna Canyon, CA. Modeled Landslide.
- Fullerton, CA. Sediment and Debris production, transport, 50-acre watershed.
- Palm Springs, CA. Transport of Aeolian Sand, PM10, saltation, creep, entrainment in "Blow Sand" area.
- Water Quality holding time criteria development, 85-percentile of average storm analysis, County of San Bernardino, Water Resources Division.

#### 2003

- Torrance, CA. Sediment transport analysis between city of Torrance and Santa Monica Bay. DDT transport.
- Analysis of TDS, viruses, bacteria, raw sewage, in New River, and Salton Sea. RMP. Evaporation
  impacts to Salton Sea salinity.
- San Clemente, CA. Analysis of landslide development.
- · Henderson, NV. Analysis of soil water excess. Perchlorate sampling and analysis
- Review of perchlorate modeling and transport, Mid-Valley Landfill, San Bernardino County, California.
- Groundwater supply and TDS levels of inflow into New River and Salton Sea, Imperial Valley, California.
- Henderson, NV. Man-made preferential pathways and groundwater transport in land development.
- Anaheim Hills, CA. Water Supply, soil water saturation, landscape methodology review, moisture accumulation, percolation tests.
- San Diego, CA. Analysis of releases, BTEX, MTBE, lead, groundwater flow, plume evolution, soil gas, soil TPH, CPT/LIF, HydroPunch data, at Mission Valley.

#### 2002

- · Honolulu, HI. Sediment transport and erosion.
- · Las Vegas, NV. Debris and sediment flow in Duck Creek.
- Irvine, CA. Statistical analysis of all Orange County sediment and contaminant data, San Diego Creek watershed.
- Ontario, CA. Modeling and analysis of Kaiser TDS plume.
- San Clemente, CA. Analysis of landslide hydrologic balance.

- Irvine, CA. Stability of erosion control measures in San Diego Creek.
- Dana Point, CA. Erosion analysis of slope failures.
- Torrance, CA. Transport of DDT in surface water, groundwater, sediment, and atmosphere, M2000 Transport of DDT from chemical plant.

San Diego, CA. Groundwater transport of fuel, free product, in Mission Valley.

## 1996 - 1998, SimulProbe Technologies. Senior Hydrogeologist

Traveled extensively throughout North America and Europe marketing various technologies. Promoted to head of marketing in the Midwest and Southwest regions. Responsibilities included; budgeting, supervising staff, project management, and making presentations to government officials and private contractors. Duties also included direct marketing to drilling firms and environmental consultants, supervising all sales personnel and marketing efforts; scheduling service calls and field operations; assisting with R&D; field training and site management.

# Miscellaneous Projects

#### 1995 - 1998, Project/Staff Geologist

- Kalamazoo, MI. Worked for the GEM Regional Center, Western Michigan University.
   Conducted water budget analysis for watershed located in Calhoun County.
- Kalamazoo, MI. Worked with the Health Division of the Michigan Department of Environmental Quality on well grouting issues surrounding public and private water supplies.
- Kalamazoo, MI. Worked with the Michigan Department of Environmental Quality on the Hydrogeological and Geochemical aspects of the Panelyte site. This involved the use of geophysics and geochemical analysis for the detection and mapping of possible contaminants.
- Ross Township, MI. Retained through Western Michigan University by the City of Kalamazoo, to determine the impact of a proposed wellfield on the surrounding surface water bodies (streams, lakes and wetlands).

#### 1993 - 1995

- Minden, MI. Retained by Michigan Peat Company to evaluate peat reserves. Evaluation
  involved sampling and mapping the peat reserves for the purpose of litigation.
- Salem, IL. Retained by Hi-Shots Aerial Photography Inc., to setup and demonstrate internet capabilities for small business.
- Michigan. Retained by Superior Environmental Corp. to conduct an EM-31 geophysical surveys.
   The surveys were designed to locate possible buried tanks in a downtown bank parking lot, a corner restaurant parking lot, fabrication/manufacturing buildings and a former car dealership.
- Schoolcraft, MI. Alpha GeoSciences Inc. (Through Department of Geology, Western Michigan University). Hired to run a hollow stem auger drill rig. Three 30-foot wells were installed.
- Kalamazoo, MI. Golder Associates Inc. (through the Institute for Water Sciences, Western Michigan University) retained to geophysically log wells located within the KL-landfill CERCLA site using a natural gamma radiation.
- Champaign/Urbana, IL. Conducted an aerial photographic survey of the Champaign/Urbana landfills to locate hot spots where possible sub-surface fires maybe burning. Contract was funded through the Illinois State Geological Survey.
- Ann Arbor, MI. Conducted aerial photographic survey of a contaminated wetland for Alpha GeoSciences Inc. of Kalamazoo, Michigan. Provided site maps of monitoring wells and sampling locations.

#### 1991 - 1993

- Sanibel Island, FL. Retained by the City of Sanibel Island, Florida to evaluate coastal erosion along the Gulf Coast side of the island for the purpose of litigation.
- Paris, France. Retained by Littoral et Patrimoine for projects in France and India. Evaluated coastal erosion and constructed possible solutions to ongoing erosion problems.
- Sandusky, OH. Designed sediment coring program along the Sandusky River and part of Lake
  Erie for project funded by the Ohio Department of Natural Resources. The sediment cores were
  used in defining the sediment input from the Sandusky River and Lake Erie on adjacent
  estuaries/marshes.
- Three Rivers, MI. Retained by Reid and Reid Law Offices, Kalamazoo, Michigan, to evaluate the
  effects of the construction of a golf course and adjacent buildings on the water quality of Lake
  Templene for the purpose of litigation.
- Portage, MI. Designed and coordinated the work on an aeration pilot project on Austin Lake.
  This project involved bottom sampling, coring and sediment profiling. Collected and analyzed
  the sediment and water samples for the Ramco Company. Prepared an independent report on the
  success of the entire project.
- Ludington, MI. Assisted on the Department of Geology's state funded project involving erosion control monitoring of Undercurrent Stabilization systems.
- Michigan. Assisted the Western Michigan University Department of Geology on a state-funded project regarding erosion monitoring along Lakes Michigan and Huron.
- Wilmington, NC and Plainwell, MI. Retained by Dr. Thomas Straw to analyze various meteorological parameters for a hydrology project in Wilmington, NC.
- Plainwell, MI. Retained by Dr. Thomas Straw to solve problems associated with a gravel pit operation.

## 1990 - 1991

- Atlanta, GA. Retained as consultant by Sutherland, Asbill & Brennan, to address a wetland
  problem within one of Mobil Land Development Company's major developments. This included
  wetland hydrology, soil chemistry monitoring and aerial photographic interpretation. Litigation
  support.
- Benton Harbor, MI. Member of Scientific Party Great Lakes Mapping cruise of eastern Lake Michigan (United States Geological Survey cruise no. NPTN91-1). The resultant sediment samples were split between WMU and the USGS allowing for research on shape analysis for possible finger printing.
- Western Michigan University, Institute for Water Sciences. Research assistant on a United States Geological Survey funded project along the Lake Michigan shoreline.

#### 1989 - 1990

 Western Michigan University. Worked with the Department of Geology on small construction projects and consulted on a state funded project addressing shoreline erosion.

#### 1983 - 1989

Hutchinson, MN, 3M Company. Worked at various jobs for the 3M Company including heavy
equipment operator, hazardous waste disposal, and computer database operator.

#### TEACHING EXPERIENCE

2006 - Present California State University, Fullerton, CA

Associate Professor of Hydrogeology. Responsible for teaching lower division classes in Hydrogeology (GEOL 436); Physical Geology (GEOL 101-GE); Water Crisis in California (GEOL 310T): Sedimentology and Stratigraphy (GEOL 321); Hydrology and Surface Processes (GEOL 335) and upper division classes in Groundwater Modeling; Environmental Sampling and Protocols; Well Hydraulics and Aquifer Analysis (GEOL 535T)

2015 - Present Western Michigan University, Kalamazoo, MI, Adjunct Associate Professor, Department of Geosciences.

2000 – 2006 <u>California State University, Fullerton. CA</u>
Assistant Professor of Hydrogeology. Responsible for teaching lower division classes in Hydrogeology (GEOL 436); Meteorology (GEOL 340-GE); Oceanography (GEOL 333-GE); Physical Geology (GEOL 101-GE) and Lab (GEOL 101L-GE) and upper division classes in Groundwater Modeling; Environmental Sampling and Protocols; Well Hydraulics and Aquifer Analysis (GEOL 535T); Research Methods in Geology (501); Geology Seminar (GEOL 590)

2001 – 2016 Western Michigan University, Kalamazoo, MI Responsible for Summer Field Course in Hydrogeology. Teach at least 1-week graduate level field course(s) every year including (1) Principles of Well Drilling and Installation; (2) Principles and Practices of Aquifer Testing; (3) Remediation Design and Implementation

1999 – 2000 <u>California State University, Fullerton. CA</u>
Part-time instructor. Responsible for Oceanography (GEOL 333) and Water Quality (GEOL 437).

1992 - 1996 Western Michigan University. MI Graduate Student Instructor responsible for Hydrogeology (GEOL 435), Oceanography (GEOL 333), and Hydrogeology Summer Field Course (GEOL 535 a, b, c, d, e and f). This field course consisted of six individual modules (40-Hour HAZWOPPER, Environmental Surface Geophysics, Principles of Well Drilling and Installation, Principles and Practices of Ground-Water Sampling and Monitoring, Principles and Practices of Aquifer Testing and Analysis, and Remediation Design and Implication). Other responsibilities included Construction Measurements and Layout through the Department of Engineering Technology. Responsible for the lab sequences only.

## Other Teaching Experience

- 2018 Instructor CalGeo Soil Logging and Litigation
- 2016-17 Instructor SCGS Soil Sampling and Classification Short-Course
- 2012 Instructor NGWA Hydrogeology Field Methods Course: What you didn't learn in School. Andover, MN.
- 2010-11 Reviewer/Participant Worked with Healthy Heroes, LLC developing educational videos.
- 1996 98 Instructor Eight-hour OSHA HAZWOPER supervisor course (29 CFR 1910,120 (e)(3).
- 1995 Hi-Shots International Conference. Taught short-course on environmental remote sensing utilizing a helium-filled tethered blimp. 10 individuals attended the course.
- 1992 Kalamazoo, Michigan. Teaching Assistant for a course titled Shoreline Geology and Processes. Course sponsored by the Secondary Education of Michigan Summer (SEMS). This was a state-funded project. (30 students)
- 1991 St. Joseph, Michigan, Berrien County. Teaching assistant for a course titled Shoreline Geology and Processes sponsored by the SEMS State funded project. (30 students)

## Developed CSUF-Departmental Short-Courses:

- CPT Demonstration Day Gregg Drilling (2010)
- AMS Demonstration Day (2009)
- GeoProbe Demonstration Days (2009 2011, 2017)
- Westbay Multiport Sampling (2004-09, 2017)
- CPT Field Demonstration on Quality Environmental Site Investigation. (In-cooperation with Gregg Drilling) (2004)
- Environmental Sampling Procedures and Practices (2003)
- Borehole and Well Logging Interpretation (Taught at Layne Christenson) (2003)
- Baroid Industrial Drilling Products Drilling and Boring Fluids (2002)
- GIS Course I & II What is GIS and how can it be utilized in research (2001)
- FEMA Advanced HAZUS Training for GIS Professionals (2001)

#### TEACHING PHILOSOPHY

As a professor, my main goal is to provide students with practical experience essential for building a successful career. In addition to providing the "nuts and bolts" of a subject, I encourage students to apply traditional knowledge to innovative approaches through applied research and hands-on experience. I aspire to motivate students by fostering participation in unique learning opportunities, many of which are provided by local companies, agencies, and vendors willing to share their services and expertise.

Through private and government grants and contracts, I am able to provide multiple funding opportunities to my students, allowing them the means to spend more time on their academic studies and also providing experience through field-related projects. My main research focus is groundwater hydrology and hydrogeology of arid environments. Most of my students directly participate in this research and are able to obtain either Bachelor's or Master's degrees through individual projects for which they are responsible.

I encourage my students to actively participate in professional organizations in order to build strategic partnerships and create a broad reaching network of individuals and indispensable resources. Further, I encourage students to present abstracts and posters at local and national conferences and to publish their research as much as possible in order to stimulate educated discussions with their peers and accomplished professionals.

The best way to measure the effectiveness of my objectives and to judge my goals is to elicit student feedback and evaluation. I am consistently rated very high by my students in their end of semester assessments. My biggest reward as a teacher is a lasting professional and personal relationship with my students. I enjoy working with and supporting students through their academic careers and feel honored when they graduate with a professional degree.

## AWARDS, HONORS, SPECIAL QUALIFICATIONS

- NGWA 2014 Ross L. Oliver Award
- NGWA 2014 Keith E. Anderson Award
- Western Michigan University 2011 Distinguished Alumni Award
- NGWA 2009 McEllhiney Lecturer for Water Well Technology
- International Ground Source Heat Pump Association (IGSHPA) Accredited Trainer (20589-0709)
- Boy Scouts of America Merit Badge Sponsor: Geology, Oceanography, Environmental Science and Soil and Water Conservation
- CSUF Student Association, Outstanding Academic Advisor (2003/04)
- CSUF NSM Nominee for Outstanding Contributions to Student Success Award (2002/03 & 2003/04)
- Western Michigan University established a scholarship in my honor for the outstanding hydrology field camp students. Awarded annually since 1998.
- Western Michigan University, Department of Geology, Distinguished Service Award, 1997.
- Western Michigan University Research Fellowship 1991-1992.
- IEEE OCEANS 92' student paper finalist.
- OSHA 40-Hour Hazwoper Supervisor, active

#### NATIONAL AND UNIVERSITY COMMITTEES

- CSUF, Hiring Committee for VP Advancement (2018)
- CSUF, University Advancement Committee Member, 2003-05; 2011-15; 2017-19 (chair 2017-19)
- CSUF, Freshman Pathways (Sustainability), Committee Member, 2013-2015
- CSUF, ENST Advisory Committee, 2004 present
- NSM, Safety Committee Member, 2010-2014
- NSM, Service Learning, Committee Member, 2001-2007
- NSM, Tucker Wildlife Advisory Board, 2003-2007
- NSM, Career Opportunity Committee, 2004-2006
- WMU, Geosciences Advisory Council Member 2007 present (co-Chair 2013-2017)
- GRAC State Meeting Committee Member 2007-2009
- GRAC Educational Committee Member 2009 present
- NWRI Independent Advisory Panel; OCWD Santa Ana River Monitoring Program, 2006-2012
- Long Valley Hydrologic Advisory Committee, 2003-2009

## NATIONAL GROUND WATER ASSOCIATION

- NGWA Research and Education Foundation, President, 2015-2017
- NGWA Research and Education Foundation, Board Member, 2010-2014, 2017-2018
- Scientists and Engineers Division, Past Chair 2012-2014
- Scientists and Engineers Division, Chair 2010-2012
- Scientists and Engineers Division, Vice-Chair, 2008-2010
- Scientists and Engineers Division, Board Member, 2004-2008; 2016-2020
- NGWA McElliney Lecture Committee, 2014 present (chair 2014)
- NGWA Board of Directors, 2008-2014
- NGWA Council for External Relations, 2010-2012
- NGWA Council for Planning, 2006-2010
- NGWA Professional Development Committee Member, 2000 (chair 2009-2010)
- NGWA Groundwater Summit Co-Chair (2006): Committee Member (2005, 2007-2012)
- NGWA National Certification Committee Member, 2002-2008
- NGWA Finance and Budget Standing Committee, 2008-2012
- NGWA American Geological Institute Representative, 2009-2010

# FUNDED GRANTS and CONTRACTS (CSUF total to date through 2016: over \$ 3,000,000)

#### 2017

 Water Replenishment District of Southern California (\$5,000). Grant to develop full proposal to deal with groundwater outreach education instruction.

#### 2016

 California High Speed Rail Authority (\$500,000); Oversee Groundwater issues as they may pertain to construction and operations of the California High Speed Rail. Including groundwater modeling review and deep groundwater monitoring.

#### 2014

Olivenhain Municipal Water District (\$2,500); Water Resource Document Archiving.

#### 2004 - 2014

Mojave Water Agency (\$2,099,000); Grant for work on Water Resource Evaluation and Mapping
 — Mojave Desert Region (Alto, Este, Oeste and Centro Hydrologic Sub-areas).

#### 2003

- Mojave Water Agency (\$217,000); Water Resource Research within the Mojave Desert. Part of
  this project is to development a GIS/Database inventory of all wells, groundwater elevations and
  hydrogeochemistry of each basin within the boundaries of MWA. Specific portions of the grant
  have been set aside to collect and analyze data from a 2,500-foot-deep multiport monitoring well
  in the vicinity of Oro Grande Wash.
- Friends of the San Gabriel River (\$32,000); Citizens Monitoring Program Development and Implication. This was funded through a State of California Grant (Prop 50).

#### 2002

- Mojave Water Agency (\$57,405); Groundwater Investigations to look at potential recharge areas
  throughout the Southern Mojave Desert Area. Establishment of digital well log inventory and
  bibliographic search of all documents pertaining to MWA water agency. CSUF was also charged
  with developing a key well program for Lucerne Valley based on groundwater basin recharge.
- CSUF Service-Learning Mini-Grant (\$1,500); The integration of Service Learning into Advanced Environmental Geology.
- Earth Consultants International, Inc. (\$3,000); Geologic Interpretation of borehole geophysics.
   Involves the gamma-ray logging and interpretation of subsurface geology.

#### 2001

- CSUF Service-Learning Mini-Grant (\$3,000); The integration of Service Learning into Advanced Hydrogeology Sampling.
- San Elijo Lagoon Conservancy (\$35,000); Sediment Quality and Depositional Environment of San Elijo Lagoon.
- Los Angeles Regional Water Quality Control Board (\$31,000); The Santa Clara River Watershed; GPS and Observational Report on the Santa Clara River
- Grant to develop a web-based model on Distance Calibration of Earth Images (\$800). This was
  part of Advanced Technology in Science Learning Environments Grant through the Department
  of Biology.
- CSUF Summer Support Assistance (\$5,000); This was summer support money to provide assistance in the sampling of water and soil throughout Orange County, California.

## 2000

 Los Angeles Regional Water Quality Control Board (\$25,000); The San Gabriel River Watershed; GPS and Observational Report on the San Gabriel River from the Whittier Narrows region to Seal Beach.

## IN-KIND DONATIONS for Research / Projects

- Woolly Mammoth (est. \$500,000); Donated by Gregg Family Foundation
- Software (Visual Modflow) (\$2,700); Donated by Earth Forensics Inc.
- Soil sampling supplies and equipment (\$2,500); Donated by GeoProbe.
- Deep Multiport Westbay Monitoring Well (\$300,000); A deep multiport monitoring well was
  installed on the northwestern portion of campus in order to develop a long-term monitoring
  program for groundwater in the north Orange County groundwater basin. The well was installed
  with sampling ports at 6 different zones to a total depth of 850 feet below ground level. The
  entire project was donated.
- Miscellaneous equipment, supplies and laboratory analysis has been donated for a multitude of different projects (\$50,000). These donations have been used for student thesis research and classroom activities.
- Sampling Truck (value \$30,000). The vehicle is specially designed to collect water samples downhole – equipped with twin generators and large capacity hydraulic system. Donated by Earth Technologies, Inc.
- Ford F-250 Pickup (\$8,000); Donated by URS Corporation.
- Generator (\$2,500); Donated by Aquifer Science and Technology.
- Software (Waterloo Hydrogeologic Visual Modflow, AquiferTest and Aquachem) (\$10,000).
- Software (Groundwater Vistas) (\$2,500).
- Conference table and chairs (\$500); Donated by URS Corporation.
- Arboretum Groundwater Study (approximately \$10,000); Drilling and installation of 3
  monitoring wells for the purpose of developing curriculum for general hydrogeology. These
  wells are part of a larger project to interpret the hydrogeology of CSUF and the local area.

# PROFESSIONAL PUBLICATIONS, ABSTRACTS, PRESENTATIONS and POSTERS

# Peer-Reviewed Publications (Published, Accepted, Submitted)

- Dailey, D., Sauck, W., Sultan, M., Milewski, Laton, W.R., Foster, J., Ahmed, M., Schmidt, C., Eckhart, L., Garcia, A., Chouinard, K., 2014. Geophysical, geochemical, and remote sensing applications for a better understanding of the structural controls on groundwater flow in the Lucerne Valley, California. Journal of Hydrology: Regional Studies.
- Laton, W.R., 2006. Building Groundwater Monitoring Wells on Campus A Case Study and Primer. Journal of Geoscience Education (Vol. 54, No. 1), pgs 50-53.
- Laton, W.R., Whitley, R.J., and Hromadka II, T.V., 2006. A Methodology for Identifying the Potential Source of Groundwater Contamination in a Multiple Source Problem Using a New Mathematical Approach. Hydrogeology Journal. DOI 10.1007/s10040-006-0106-4
- Laton, W.R., Hromadka II, T.V. and Picciuto J.A., 2006. Estimating Runoff Quantities for Flow and Volume-based BMP Design. Hydrological Science and Technology, Volume 22, No.1-4.
- Laton, W.R., 2004. Seepage, Flow and Chemical Partitioning Between the City of Parchment Wellfield and the Kalamazoo River, Southern Michigan. Journal of Floodplain Management (Vol. 4, No. 1), pgs 11-32.
- 6. Foster, J.F., Laton, W.R., and Figueroa, O. Sudden Late Holocene closure of San Elijo Lagoon, northern San Diego County, California. Environmental and Engineering Geosciences (in review)
- 7. Velarde, J.C., Foster, J.F. and Laton, W.R., A profile of two springs in the vicinity of Pitzer Buttes/Silver Creek, Lucerne Valley, San Bernardino County California. (in review)

### Guidebooks, Full Paper Proceedings and Articles

- Laton, W.R. and Krstich, B., 2010. Zoom Zoom, Public works managers are now using Google Earth to track environmental and water resources. Public Works Online. (Public Works Manual 2010)
- Laton, W.R., 2005. The Cutting Edge "Teaching Hydrogeology in the 21st Century". NGWA-AGWSE News and Views. (article September 2005)
- Jenson, J. and Laton, W.R., 2005. Second Annual Groundwater Summit. NGWA-AGWSE News and Views. (article September 2005)
- Laton, W.R., 2004. Building Ground Water Monitoring Wells on Campus: A Case Study and Primer. NGWA-AGWSE News and Views. Vol. 1, Issue 1.
- D. Bausch, E. Gath, T. Gonzales, and R. Laton, 2000. GIS-Based Hazard Mapping and Loss Estimation in the Safety Element of the General Plan for Riverside County, California. California: EERI 6th International Conference on Seismic Zonation, Riverside County, California.
- Laton, W.R., Perez, R., and Bausch, D., 2000. New Hazard Maps for Riverside County, California. San Diego Association of Geologists annual field trip guidebook.
- Laton, W.R., 1992. Small-Scale Coastal Cells as Control Mechanisms on Sediment Movement; Identification and Mapping. OCEANS '92, Newport, Rhode Island.

#### PUBLIC REPORTS

- Laton, W.R., 2016. Phase I Groundwater Study Palmdale to Burbank Section of California High Speed Rail. California High Speed Rail Authority.
- 2. Laton, W.R., 2016. DTSC Aquifer Test Guidance. Reviewer for draft guidance document.
- Foster, J., Laton, W.R., et. al., 2008. Geologic Map Series of Mojave Region. (750, 500, 250, 24' and 15'). Mojave Water Agency. Revised series, Fall 2010.
- 4. Laton, W.R., Foster, J., et. al., 2007. Oeste Hydrologic Sub-Basin Report. Mojave Water Agency.
- Hromadka, II, T.V., Laton, W.R. and <sup>2</sup>Perez, R., 2006. Hydrologic Data Report October 17-21, 2004 Storms. Orange County Flood Control District.
- Laton, W.R., Foster, J., et. al., 2007. Groundwater Atlas of Oeste Hydrologic Sub-basin. Mojave Water Agency.
- Laton, W.R., Foster, J., <sup>2</sup>Ebbs, V., <sup>2</sup>Blazevic, M., and <sup>1</sup>Napoli, N., 2007. Harper Lake Hydrologic Sub-Basin Report. Mojave Water Agency.
- 8. Laton, W.R., Napoli, N., and Eckhart, L., 2006. Flow between Basins -Baja Hydrologic Sub-Basin to Afton Canyon Report. Mojave Water Agency.
- Laton, W.R., <sup>2</sup>Napoli, N., and Eckhart, L., 2006. Flow between Basins Este to Alto Hydrologic Sub-Basins Report. Mojave Water Agency.
- Laton, W.R., <sup>2</sup>Napoli, N., and Eckhart, L., 2006. Flow between Basins Oeste to Alto Hydrologic Sub-Basins Report. Mojave Water Agency.
- Laton, W.R., <sup>2</sup>Napoli, N., and Eckhart, L., 2006. Flow between Basins -Alto to Centro Hydrologic Sub-Basins Report. Mojave Water Agency.
- Laton, W.R., <sup>1</sup>Napoli, N., and Eckhart, L., 2006. Flow between Basins Centro to Baja Hydrologic Sub-Basins Report. Mojave Water Agency.
- Hromadka, II, T.V., Laton, W.R., and Picciuto, J.A., 2005. Estimating Runoff Quantities for Flow and Volume-based BMP Design. San Bernardino County Flood Control District.
- 14. Laton, W.R., Foster, J., et. al., 2004. Este Hydrologic Sub-Basin Report. Mojave Water Agency.
- 15. Laton, W.R., Foster, J., et. al., 2004. Groundwater Atlas of Este Hydrologic Sub-basin. Mojave Water Agency.

- 16. Laton, W.R., et. al., 2004. San Gabriel River Watershed Atlas. Friends of the San Gabriel River.
- Laton, W.R., et. al., 2004. San Gabriel River Watershed QAPP and Sampling Manual. Friends of the San Gabriel River.
- 18. Laton, W.R, <sup>2</sup>Kendall, D. and <sup>2</sup>Lizzy, A., 2004. *Drilling Methods and Materials*. On-line course material for NGWA.
- 19. Blazevic, M. and Laton, W.R., 2004. Mojave River Stream Gauging. Mojave Water Agency
- Laton, W.R., 2002. Taylor Yard and Los Angeles River Preliminary Groundwater and Surface Water Study, Groundwater Model of Taylor Yard and Vicinity, Los Angeles, California. California Coastal Conservancy.
- 21. Laton, W.R. and Foster, J., 2001. Sediment Quality and Depositional Environment of San Elijo Lagoon, San Diego County, California. San Elijo Nature Conservancy and Fish and Wildlife Service.
- Laton, W.R. and Foster, J., 2001. Santa Clara River Watershed Inventory. Los Angeles Regional Water Quality Control Board.
- Laton, W.R. and Foster, J., 2000. The San Gabriel River Watershed GPS and Observational Report on the San Gabriel River from the Whittier Narrows region to Seal Beach. Los Angeles Regional Water Quality Control Board.
- 24. Straw, W.T., <sup>2</sup>Hascall, A.P., <sup>2</sup>Laton, W.R., and <sup>1</sup>Dalman, M., 1997. Groundwater Surface Water Interaction Study in Ross Township. City of Kalamazoo, Michigan.
- Straw, W.T. and <sup>2</sup>Laton, W.R., 1993. WMU Austin Lake Aeration Feasibility Study Evaluation. City of Portage, Portage, Michigan.
- Straw, W.T., <sup>2</sup>Wardwell, D.A. and <sup>2</sup>Laton, W.R., 1992. An Evaluation of Undercurrent Stabilization Anchor System Installation at Douglas and Tawas City, Michigan. Michigan Department of Natural Resources.

<sup>1</sup>Undergraduate Student <sup>2</sup>Graduate Student

#### Abstracts, Presentations and Posters

- Laton, W.R., 2018. 20-Years of CSUF Research From Mojave to the Ocean. California Groundwater Resources Association, Southern Branch (Invited).
- Laton, W.R., 2018. Groundwater The Water beneath Our Feet. CSUF Fullerton Arboretum (Invited).
- 3. \*Perez, R. and \*Laton, W.R., 2018. The Use of UAVs for Groundwater Research. California State University, San Bernardino (Invited).
- \*Perez, R. and Laton, W.R., 2017. UAV's for Use in Groundwater Resources. NGWA Expo, Nashville, TN.
- 5. Laton, W.R., 2017. Introduction to Borehole Geophysics. NGWA Expo, Nashville, TN.
- Laton, W.R., 2017. Malibu California, Wastewater and Politics. Southern California Chapter of AEG (Invited)
- 7. Laton, W.R., 2017. Low Altitude Photography Utilizing UAVs Geologic and Hydrologic Applications. Los Angeles Basin Geological Society (Invited)
- 8. Laton, W.R., 2016. Preparing for the Field, What to Take? NGWA Expo, Las Vegas, NV.
- Laton, W.R., 2016. Wastewater, Politics and Science. South Coast Geological Society (Invited presentation).
- 10. Laton, W.R., 2016. *Malibu, California; A Story of Wastewater, Politics and Science*. Western Michigan University. (Invited presentation)
- 11. Laton, W.R., 2016. Holding Back the Ocean and Recharging Aquifers with Treated Wastewater. Minnesota Groundwater Association, Annual Meeting. (Invited presentation).
- 12. Laton, W.R., 2016. UAV Mapping and Business Opportunities. Ground Water Institute. Tucson, AZ. (Invited Presentation)

- 13. Laton, W.R., 2016. *Malibu, California; A Story of Wastewater, Politics and Science*. GSA Section meeting, Ontario, CA. (abstract/presentation)
- 14. \*Perez, R., Laton, W.R., Cruikshank, M. and Hugh, C., 2016. UAV Imagery and Mapping: What are the Capabilities and Limitations? SAGEEP 2016, Denver, CO. (abstract/presentation)
- 15. Laton, W.R., 2015. Sounder Selection Show and Tell. NGWA Expo, Las Vegas, NV.
- 16. Laton, W.R., 2015. Preparing for the Field What to Take? NGWA Expo, Las Vegas, NV.
- 17. Laton, W.R., 2015. Using Sand Tank Models to Explain Groundwater Flow. NGWA Expo, Las Vegas, NV.
- 18. Laton, W.R., 2015. When does it make Sense to Learn from a Person vs. Learn from a Device? NGWA Expo, Las Vegas, NV.
- 19. Laton, W.R. and Perez, R., 2015. Low Altitude Photography Utilizing UAV's. Long Beach State University GIS Day Mixer. (Invited presentation)
- 20. \*Laton, W.R., \*Perez, R. and \*Cruikshank, M., 2015. Low Altitude Photography utilizing UAV's Geologic and Hydrologic Applications. IGS, Riverside, CA. (Invited presentation)
- Laton, W.R. 2015. Boring Logs What's Important and What's Not: A Scientific Viewpoint and Drones for Use in Water Resources. Mountain States Groundwater Expo, Laughlin, NV. (Invited – presentation)
- 22. Laton, W.R. 2015. Backyard Soils. Natural OC, Santa Ana, CA. (Invited presentation)
- 23. Laton, W.R. 2014. Using Google Earth for Hydrogeological Problem Solving. NGWA Expo, Las Vegas, NV. (workshop)
- Laton, W.R. and Perez, R., 2013. Got Geological Problems-How to Use Innovative Multimedia Applications to Identify and Analyze Them. NGWA Expo, Nashville, TN. (workshop)
- 25. Laton, W.R., 2013. Hydrogeology 101. NGWA Expo, Nashville, TN. (lecture)
- 26. Laton, W.R., 2012. Hydrogeology 101. NGWA Expo, Las Vegas, NV. (lecture)
- Laton, W.R., 2012. Using Sand Tank Models to Teach about Groundwater. NGWA Expo, Las Vegas, NV. (workshop)
- Laton, W.R., 2012. Geothermal Forum: Business Success Through Excellent Performance Hydrogeology (Really) Does Matter. NGWA Expo, Las Vegas, NV (lecture)
- Laton, W.R., 2011. Using Sand Tank Models to Teach about Groundwater. NGWA Expo, Las Vegas, NV. (workshop)
- 30. \*2Dailey, D.R., Sauck, W.A., Sultan, M., Milewski, A., Laton, W.R. and Foster, J.H., 2011. Geophysical and Remote Sensing Applications for better understanding of the Structural (Faults/Basement Uplifts) Controls on Groundwater Flow in the Lucerne Valley, California. GSA Annual Meeting. (abstract/presentation)
- Laton, W.R., 2011. Implications of Surface Water/Groundwater Interaction or Groundwater and the Impacts on Surface Water Delivery. Declining Groundwater Levels: Measuring, Monitoring, and Mitigation. NGWA Virtual Conference.
- 32. Laton, W.R., 2011. *Hydrogeology 101*. Santa Susana Field Laboratory seminar series. (workshop)
- 33. \*2Barker, S., Laton, W.R. and Foster, J.H., 2010. An investigation of potential surficial recharge in the Lucerne Valley groundwater basin, Mojave Desert, CA. Anaheim, CA. GSA Abstract with Programs. Vol. 42, No. 4, p. 97, Paper No. 45-2.
- 34. Laton, W.R., 2010. Boring Logs What's Important and What's Not: A Scientific Viewpoint. GRA Webinar.
- 35. Laton, W.R., 2010. Using Google Earth in Water Resources Research. NGWA Webinar.
- Laton, W.R., 2010. Hydrogeology 101. NGWA National McEllhiney Lecture 2010, Sponsored by the NGWAREF (Invited 7 presentations throughout the U.S.)
- Laton, Richard, \*2Al Harbi, Talal, Sauck, William A., Foster, John, Sultan, Mohamed, Milewski, Adam, Marsala, Peter, Balekai, Rajesh, and Salim, Hassan, 2009. Use of Geophysical and

- Remote Sensing Data for a Better Understanding of the Hydrologic Role of Faults in the Mojave Desert. GSA Annual Meeting, (abstract/poster)
- 38. Laton, W.R., 2009. Using Google Earth. NGWA Expo, New Orleans, LA. (workshop)
- 39. Laton, W.R., 2009. Hydrogeology 101. NGWA Expo, New Orleans, LA. (workshop)
- Laton, W.R., 2009. Boring Logs What's Important and What's Not: A Scientific Viewpoint. NGWA National McEllhiney Lecture 2009, Sponsored by NGWAREF. (Invited 30+presentations throughout North America)
- 41. Foster, J.H. and Laton, W.R., 2008. Groundwater Resources Sustainability in the Victorville Area: Results from the Oro Grande Wash Recharge Pilot Study. Association of Engineering Geologist. (abstract/presentation)
- 42. \*Dailey, D., Laton, W.R., and Foster, J.H., 2008. New Detailed Model for El Mirage Subsurface Geology, El Mirage, CA. GRA Annual Meeting. (abstract/poster)
- 43. \*IVelarde, J.C., Foster, J.H., and Laton, W.R., 2008. The Geology of Spring Systems in the Vicinity of White Mountain/Silver Creek, Lucerne Valley, San Bernardino County California. GRA Annual Meeting, (abstract/poster)
- 44. \*2Monzon, E. and Laton, W.R., 2008. Estimating Applied Irrigation for Urban Landscapes in South Coast California, using Theoretical and Conventional Means. GRA Annual Meeting. (abstract/poster)
- 45. Lizzi, A., Laton, W.R., Foster, J.H., 2008. Evaluation of the Potential Groundwater Resources of A Confined Aquifer, San Diego County, California. NGWA Groundwater Summit (abstract/presentation)
- Laton, W.R., 2006. Surface Water and Ground Water: How the Two Interact. NGWA National Meeting. (Invited - presentation)
- 47. \*1Cruikshank, M.J., Foster, J.H. and Laton W.R., 2006. Presence of Deep High-Quality Ground Water in El Mirage Valley, San Bernardino County, California. NGWA Groundwater Summit (abstract/poster) (Outstanding Research Award)
- 48. \*2Surko, T., Armstrong, P.A. and Laton, W.R., 2006. Gravity Survey of Lucerne Valley Ground Water Basin, Mojave Desert, Southern California: Implications for Basin Geometry and Structure. NGWA Groundwater Summit (abstract/presentation)
- 49. \*2Barthel, P.S. and Laton, W.R., 2006. Desert Studies Center: A Hydrogeologic Model and Water Budget. NGWA Groundwater Summit (abstract/presentation)
- Laton, W.R., 2005. Methods to Determine Basin Yield. GRA Groundwater Resources Series Basin Yield and Overdraft: Scientific and Legal Perspective. (Invited – presentation)
- Laton, W.R., 2005. Borehole Logging from Sample Collection to Borehole Geophysics. Presented at NSF Workshop on "Teaching Hydrogeology in the 21st Century". (presentation/lab write-up)
- 52. Laton, W.R., 2005. Water Budget Analysis A Story of Two Arid Region Groundwater Basins. CEA-Crest Symposium on Arid Hydrology. (abstract/presentation)
- \*Laton, W.R., Hromadka, T., Yeager, M., Picciuto, J. and Whitely, B., 2005. A New Method for Estimating Runoff Quantities for Flow and Volume-based BMP Design. CASQA Conference. (abstract/presentation)
- 54. <sup>62</sup>Lizzi, A.L., Laton, W.R. and Foster, J., 2005. Evaluation of the Potential Groundwater Resources of the Golem Well West Rancho Bernardo, San Diego County, California. NGWA 2005 Groundwater Summit. (abstract/poster)
- 55. \*2Boeke, B., Laton, W.R. and Foster, J., 2005. Groundwater Potential for Harper Dry Lake: Implications for Ground Water Availability in Harper Valley, San Bernardino County, California. NGWA 2005 Groundwater Summit. (abstract/poster)
- \*2Kolstad, K. and Laton, W.R., 2005. Hydrocarbon Soil Vapor: Actual vs Predicted. NGWA 2005 Groundwater Summit. (abstract/poster)

57. \*1 Napoli, N. and Laton, W.R., 2005. Hydrogeologic Evaluation of a Desert Groundwater Basin; Lucerne Valley, California. NGWA 2005 Groundwater Summit. (abstract/poster)

58. \*2Perez, R. Foster, J. and Laton, W.R., 2005. The Redefining of a Groundwater Basin, Alto Sub Basin, Southwestern Mojave Desert, California. NGWA 2005 Groundwater Summit. (abstract/poster)

\*2Surko, T.L., Armstrong, P. and Laton, W.R., 2005. Gravity Survey of Lucerne Valley Groundwater Basin, Mojave Desert, Southern California: implications for basin geometry and

structure. NGWA 2005 Groundwater Summit. (abstract/poster)

60. \*Blazevic, M., 1Napoli, N., Foster, J. and Laton, W.R., 2004. Subsurface Geologic Investigation of a closed Alluvial Basin: Lucerne Valley, San Bernardino County, California. Groundwater Resources Association of California Annual Meeting. (abstract/poster)

61. \*1 Napoli, N., Blazevic, M., Laton, W.R. and Foster, J., 2004. Hydrogeologic Evaluation of a Desert Groundwater Basin; Lucerne Valley, California. Groundwater Resources Association of

California Annual Meeting. (abstract/poster)

62. \*2Perez, R., Foster, J. and Laton, W.R., 2004. Just how deep is it? Alto Deep Well and its impacts to Alto Groundwater Sub-Basin Geology. Groundwater Resources Association of California Annual Meeting. (abstract/poster)

63. Hunt, S. and \*Laton, W.R., 2004. Update on Geochemical Analysis of the Central Basin, Los Angeles County, California. Groundwater Resources Association of California Annual Meeting.

(abstract/poster)

- 64. \*2 Haj-Manouchehri, D. And Laton, W.R., 2003. Water Quality in Relation to Watershed Management in the Lower San Gabriel River, Southern California. WRI conference (abstract/poster)
- 65. Laton, W.R., 2003. Lessons Learned; Groundwater Flow Model Taylor Yard, Los Angeles. South Coast Geological Society. October 6, 2003. (Invited - presentation)
- 66. \*Laton, W.R. and Dolmat, J., 2003. Deep Multiport Research Monitoring Well, CSF-1. Fullerton, CA: Stratigraphy, Lithology and Geologic Setting. National Ground Water Conference. (abstract/TIPS)
- 67. Figueroa, O. and \*Laton, W.R., 2003. Ground Water Modeling of a Coastal Aquifer Malibu, California. National Ground Water Conference. (abstract/TIPS)
- 68. \*2Williams, S. and Laton, W.R., 2003. Hydrogeologic Investigation of a Shallow Aquifer System Using Long Term Aquifer Tests and Water Level Monitoring, Lower Borrego Canyon Wash, Irvine CA. National Ground Water Conference. (abstract/TIPS)
- 69. \*2 Hasegawa, S. and Laton, W.R., 2003. Risk Assessment of Point and Non-Point Source Pollution on Water Resources along the Santa Ana River. California Groundwater Conference. (abstract/poster)
- 70. \*Dolmat, J. and Laton, W.R., 2003. Deep Multiport Research Monitoring Well, CSF-1, Fullerton, CA: Stratigraphy, Lithology and Geologic Setting. California Groundwater Conference. (abstract/poster)
- 71. \*2 Williams, S. and Laton, W.R., 2003. Hydrogeologic Investigation of a Shallow Aquifer System Using Long Term Aquifer Tests and Precipitation Induced Recharge Data Lower Borrego Canyon Wash, Orange County California. California Groundwater Conference. (abstract/poster)

72. Hunt, S. and \*Laton, W.R., 2003. Geochemical Analysis of the Central Basin, Los Angeles

County, California. California Groundwater Conference. (abstract/poster)

73. Laton, W.R., 2002. Taylor Yard and Los Angeles River, Preliminary Groundwater and Surface Water Study Groundwater Model of Taylor Yard and Vicinity Los Angeles, California. NGWA National Meeting. (abstract/poster)

74. Otto Figueroa and \*Laton, W.R., 2002. Hydrogeologic Characterization and Assessment of Impacts of Wastewater Discharge for Proposed Construction, Trancas Canyon, Malibu, California. NGWA National Meeting. (abstract/poster)

- \*Laton, W.R., <sup>2</sup>Sean Hunt, and Foster, J., 2002. The Impact of Groundwater Surface Water Interaction on Contaminant Distribution, San Elijo Lagoon, California. NGWA National Meeting. (abstract/poster)
- Laton, W.R., 2002. Taylor Yard and Los Angeles River Preliminary Groundwater and Surface Water Study, Groundwater Model of Taylor Yard and Vicinity, Los Angeles, California. California Coastal Conservancy. (Invited - presentation)
- 77. Laton, W.R., 2001. Distance Calibration of Earth Images To design and develop a Web delivered lesson showing an Advance in Information Technology that can be used in a Science Learning Environment for In-service Teachers (online lesson plan).
- 78. Laton, W.R., 2001. The Role of Groundwater in Geologic Hazards. California Science Academy (CEA-Crest). (abstract/presentation)
- 79. Laton, W.R., 2001. Natural Hazards Mapping, Thailand. Thailand Geological Survey. (presentation)
- 80. Laton, W.R., 2001. Subsidence evaluation and assessment, Bangkok, Thailand. Thailand Geological Survey. (presentation)
- \*Laton, W.R., \*¹Perez, R., and \*¹Figueroa, O., 2000. Natural Hazard Mapping A GIS Approach. CSUF Geology Department.
- 82. Laton, W.R., 2000. Natural Hazards Assessment of Temecula, California. San Diego Association of Geologists annual field trip. (presentation)
- 83. \*Sauck, W. A., Laton, W.R., <sup>2</sup>Seng, D.L., and <sup>2</sup>Vandereide, M.A., 2000. Ground-penetrating radar investigations of nearshore sediments of eastern Lake Michigan. IAGLR 2000.
- 84. Laton, W.R., 1999. Watershed Management and Sampling Protocol. Korean Ministry of Environment and Environmental Management Corporation short course. (Invited presentation)
- 85. Laton, W.R., 1999. Environmental Sampling what, when and why. Port of Los Angeles, Environmental Group. (Invited presentation)
- 86. Laton, W.R., 1998. Single Point Pneumatic Slug Test, Soil Vapor Extraction (SVE) Testing During Initial Site Investigation. Hazardous Waste Section, SMARTech '98, Raleigh, NC. (abstract/presentation)
- 87. Laton, W.R., 1998. SimulProbe® Environmental Core Barrel. EPA National Site Assessment Conference. Denver, CO. (Invited presentation)
- 88. \*Marcus, D.L., <sup>2</sup>Bonds, C.L. and Laton, W.R., 1997. Rapid Screening using the SimulProbe Multimedia Sampler Case Histories and Future Directions. New England Environmental Exposition. (abstract/presentation)
- \*2Laton, W.R., 2Hascall, A.P., 2Atekewana, E.A., Hampton, D.R., 1996. Seepage Meter Spatial and Temporal Variability in the Study of Groundwater Interaction with Surface Water Features. American Geophysical Union, San Francisco, CA. (abstract/presentation)
- 90. <sup>2</sup>Laton, W.R., 1996. Well Grouting Research. Michigan Environmental Health Association, Ground Water Conference, Thompsonville, MI. (Invited presentation)
- 91. <sup>2</sup>Laton, W.R., 1996. SimulProbe Sampling in Contaminated Areas. University of Michigan Summer Hydrogeology Field Course, Wortsmith Research Center, MI. (demonstration/presentation)
- 92. \*Barnes, D.A., <sup>2</sup>Kovacich, M.S., <sup>2</sup>Limez, S., and <sup>2</sup>Laton, W.R., 1995. Error Analysis in Great Lakes Beach Profile Surveying Techniques. Canadian Coastal Conference, Dartmoth, Nova Scotia. (abstract/presentation)
- <sup>2</sup>Laton, W.R., 1995. Environmental Uses of Low-Altitude Aerial Photography. Colloquium on Environmental Earth Science, Western Michigan University, Kalamazoo, MI. (presentation)
- <sup>2</sup>Laton, W.R., 1995. Environmental Uses of Low-Altitude Aerial Photography. Hi-Shots International Conference, Saint Louis, Missouri. (Invited – presentation)

95. \*Mackey, S.D., Guy, D.E., <sup>2</sup>Laton, W.R., and <sup>2</sup>Kovacich, M., 1994. Geologic Framework of an Eroded Lake Erie Coastal Marsh – Metzger Marsh, Ohio. North-Central Geological Society of America, Kalamazoo, Michigan. (abstract/presentation)

96. \*Vincent, R.K., <sup>2</sup>Laton, W.R. and <sup>2</sup>Sattler, J., 1993. Detailed Modeling of Solid Waste Landfill Surface Water Run-off from High Resolution Elevation Data Automatically extracted From Stereo Photos Taken by a Camera on a Tethered Balloon Platform. Association of Engineering Geologists, San Antonio, Texas. (abstract/presentation)

97. <sup>2</sup>Laton, W.R., 1993. Site Characterization and Mapping Utilizing a Tethered Balloon System. HI-SHOTS International Convention, Saint Louis, Missouri. (Invited – presentation)

98. <sup>2</sup>Laton, W.R., 1992. Coastal Processes and Use of a Blimp. Shoreline Erosion and Coastal Processes in Berrien County, Lake Michigan College Environmental Center, St. Joseph, Michigan. (abstract/presentation)

 \*2Laton, W.R. and Straw, W.T., 1992. Small-Scale Coastal Cells; Identification and Mapping. First Thematic Conference, Remote Sensing for Marine and Coastal Environments, New Orleans, Louisiana. (abstract/poster)

100. <sup>2</sup>Laton, W.R., 1991. Undercurrent Stabilization Anchor Systems at Tawas on Lake Huron and Douglas on Lake Michigan – A One-Year Study. Michigan Academy of Science, Ypsilanti, Michigan. (abstract/presentation)

<sup>1</sup>Undergraduate Student; <sup>2</sup>Graduate Student; \* Presenter

# SUPERVISED COMPLETED THESES

Student Name	Year	Degree	Thesis Title
Cragg, Byron	2018	BS	Designing Scientific Payloads for Use on Extra-Planetary Rovers
Vanderwal, Joshua	2018	BS	Safety Element for Cal State University Fullerton – Understanding of Hazards Surrounding the Campus
Escobar, Adrian	2018	BS	Ground Source Heat Pump Potential Characterization for California State University, Fullerton
Meadows, Adam	2018	BS	Investigation and Monitoring the Spread of Water Contaminates Using an Open-Source Database in the Orange County Area
Alonzo, Terrinda	2018	BS	13-Year Analysis of Water Pressure and Chemical Changes from Well CSF-1, Fullerton, CA
Ibarra, Nancy	2016	BS	Drilling Methodology: A Field Guide and its Use for the Drilling Industry
Masters, John Paul	2015	BS	Subsurface Analysis of fluvial sediments from the Holocene- Pleistocene Epochs at California State University, Fullerton, California
Natividad, Anthony	2015	BS	A Hydrogeological Survey of a Mountainous Region; The Significance of Monitoring a Water Budget at a Localized Source
Law, Natalie	2014	BA	Byolution and Growth of a Mitigation Wetland A Case Study in Norco, California
Cortez, Lucy	2014	BS	Wetlands Delineation using Dendrochronology and Historical Rainfall Data to Crossdate the Climatic Stress Regimes in the Prado Dam Basin Located in Corona, Riverside County, Californ
Irani, Fabian	2013	BS	The Use of Groundwater Fluctuations in a Tidal Zone for the Determination of Aquifer Properties
Dubberke, Kirk	2013	BS	Malibu Creek Watershed - Aquifer Testing Analysis
Cadaret, Erik	2012	BS	Hydrogeologic Investigation and Geochemistry Analysis of the Sheep Creek Fans Regional Aquifer, San Bernardino County, CA
Dotzer, Alec	2012	BS	Lithologic Analysis of a Soil Layer at Various Points via a Biosparge Pilot Test at a Contaminant Impacted Site in Coachella Valley, Riverside County, CA
Daley, Dale	2008	BS	Subsurface Mapping of the El Mirage Groundwater Barrier, San Bernardino County, California
Cruikshank, Michael	2006	BS	Hydrogeological Investigation of an Open Alluvial Basin: Oeste Hydrologic Sub-basin, San Bernardino County, California
Dolmat, Joan	2006	BS	Deep Multiport Research Monitoring Well, CSF-1, Fullerton, CA Stratigraphy, Lithology and Geologic Setting
Blazevic, Mike	2005	BS	Hydrogeological Investigation of a Closed Alluvial Basin: Lucer Valley, San Bernardino County, California
Napoli, Nick	2005	BS	Change in Groundwater Storage in the Lucerne Valley Groundwater Sub-Basin — 1954 To 2002, Lucerne Valley, California

Student Name	Year	Degree	Thesis Title
Brendle, Christine	2004	BS	Remediation of Soil and Groundwater at a Former Service Station
Evans, Rachel	2003	BS	Water Quality Analysis - Yellowstone National Park
Thomas, Sean	2003	BS	Dewatering Plan for the El Toro Area
Wiles, Steffy	2002	BS	Angels Camp - Gamma Ray Logging Examination and Correlation
Figueroa, Otto	2002	BS	Hydrogeologic Characterization and Assessment of Impacts of Wastewater Discharge for Proposed Construction, Trancas Canyon, Malibu, California
Brand, Randy	2002	BS	Hydrogeologic and Geologic Considerations for Selected sites nea the Santa Margarita, Upper Ysidora, and Lower Ysidora Groundwater Basins in Southern California
Vortis, Kevin	2001	BS	Geologic History of San Elijo Lagoon San Diego County, California
Rashidi-Fard, Shaghayegh	2001	BS	Water Quality Testing and Monitoring Program at the Santa Rosa Ecological Reserve
Fields, David	2001	BS	Orange County Groundwater Contour Maps for 2000

Student Name	Year	Degree	Thesis Title
Emilio, Chelsea	2018	MS-Enst	Urban Firework Fallout
Case, Aaron	2018	MS-Enst	Perchlorate in Urban and Industrial Environments
Offner, Erica	2018	MS-Enst	Carbon Dioxide Levels in Water Vapor
Lopez, Daniel	2018	MS-Enst	Should California Price Water as a Commodity to Increase Conservation?
Masters, John Paul	2017	MS-Enst	Subsurface Analysis of Orange County Water District's La Palma Groundwater Recharge Basin in Anaheim, California
Kennedy, Taylor	2017	MS-Enst	Investigation of the Laguna Cell Beaches Using Lidar and Erosional Examination
Grajeda, Remington	2017	MS-Enst	Shaping Environmental Attitudes in Students: An Inquiry-based Approach
Pham, Christine	2016	MS-Enst	Efficacy of Capsaicin-based epoxy coating for preventing attachmen of Quagga mussels (Dresissena Bugensis)
Battig, Lisa	2015	MS-Enst	An Educational Kit Elucidating the Connections Between Sanitation Hygiene and Waterborne Disease
Morlan, Randall	2014	MS	The Effects of Agricultural Activities on the Migration of the Hinkle Chromium Plume, San Bernardino County, California
Carreon, Rosangela	2014	MS-Enst	Remote Sensing Climatic Impact on Snow Cover for the San Gabriel Mountains in Southern California
Vavricka, Emily	2013	MS-Enst	A Forensic Evaluation of Dry Cleaners: A Case Study in Santa Ana, California
Lockhart, Benjamin	2013	MS-Enst	Colonial Nesting Seabirds in Burris Basin: Forage Prey Availability Assessment and Habitat Enhancement Suggestions
Maine, Lindsay	2013	MS-Enst	Media Blending: Which Combination is Best for Stormwater Discharge from Scrap Metal Recycling Operations?
Martin, Allen	2012	MS-Enst	Lower Owens River Project, Recovery: A longitudinal imagery analysis of near river vegetation change along the Owens River, Owens Valley, Inyo County, California
Hoffman, Michael	2012	MS	Hydraulic Tomographic Modeling of the Yorba Linda Water Well Field, Yorba Linda, California
Sickler, Heidi	2012	MS-Enst	Environmental Change in the Wetland Ecosystem of Fish Slough in Bishop, California Derived from Wetland Delineation Methods and Aerial Photography
Xayarath, Van	2012	MS-Enst	Orange County's Water Supply: A preliminary research to convert storm channels to natural bottom streams for basin recharge
Rimbenieks, Mikaila	2011	MS-Enst	Quantifying Forest Natural Background and Road Sediment Yield in Big Bear Lake, California
Evans, Patrick James	2011	MS-Enst	Desalination in Southern California: The Inevitable wave of the future!
Barker, Shelby	2010	MS	An Investigation of the Potential for Surficial Recharge in the Lucern Valley Groundwater Basin, Mojave Desert, CA
Luedy, Justin	2009	MS-Enst	Testing the Relationship of Dissolved Metals in Stormwater, Newpor Beach, California

Student Name	Year	Degree	Thesis Title
Monzon, Eric	2008	MS-Enst	Estimating Applied Irrigation for Urban Landscapes in South Coast Southern California, Using Theoretical and Conventional Means
Barthel, Peggy	2008	MS	Water Budget and Hydrogeologic Model of Spring Flow at Limestone Hill, Zzyzx Desert Studies Center
Ebbs, Veva	2007	MS-Enst	Groundwater flow into Harper Lake, California
Kolstad, Kenneth	2007	MS	Analysis of a Steady-State Model: Prediction of Trichloroethylene Vapor Concentration, Using Known Dissolved Phase Concentration
Lizzi, Anthony	2007	MS	Evaluation of the Potential Groundwater Resources of the Golem Well West Rancho Bernardo, San Diego County, California
Patschull, Eric	2007	MS	Evidence of a North Projecting Ancient Boulder Thalweg in Latest Quaternary Deposits of the Santa Ana River, Orange County, California
Hunt, Sean	2006	MS	Artificial Recharge as Possible Causes of Observed Long —Term Change in Transmissivity for the Aquifers of the San Pedro Formation in the Central Basin of the Greater Los Angeles Basin, California
Williams, Steve	2006	MS	Hydrogeologic Investigation of a Shallow Aquifer System with Emphasis on Precipitation Induced Groundwater
Nguyen, Chinh	2005	MS-Enst	Application of Convex Hull in Identifying Pollution Sources in the Central and West Coast Basins, Los Angeles County, California
McCurdy, Jim	2004	MS-Enst	Water Chemistry and Groundwater Flow for the San Bernardino Mountains
Versluis, Patrick	2004	MS-Enst	The Fate of Perchlorate; A Look at Perchlorate Entering Orange County's Groundwater
Hajmanouchehri, Daneh	2004	MS-Enst	Water Quality in Relation to Watershed Management in The Lower San Gabriel River, Southern California
Yuen, Pansy	2004	MS-Enst	Performance Assessment on Water Quality and Biological Effects of Urban Stormwater Runoff, Norco Hills Wetland, Riverside County, California
Figueroa, Otto	2003	MS	Groundwater Flow Model of a Coastal Aquifer, Malibu, California
Hasegawa, Shuichi	2003	MS-Enst	Environmental Hazard Risk Assessment on Water Resources along the Santa Ana River
Kerza-Kwiatecki, Paul	2003	MS-Enst	Monitoring the Rocky Inter-Tidal Zone of Crystal Cove State Park; Creation of an interactive GIS bio-database
Springer, Ben	2003	MS-Enst	The Importance of Wetland Monitoring: A Case Study of a Restored Wetland in Norco, California
Rosales, Tom	2002	MS-Enst	An examination of the benefits and costs to implement the Municipal Storm Water Permit for Orange County – similarities and differences between coastal and inland cities
Schmucker, Kelly	2002	MS-Enst	Water Quality of a Wetland A Case Study in Norco, CA
Eckhart, Lance	2001	MS-Enst	Vertical Gradient Investigation of a Southern California Landfill

## SELECTED SHORT-COURSES, WORKSHOPS ATTENDED

- Johnson Screens Groundwater and Wells
- IGSHPA Train the Trainer Course
- NGWA Keeping the Pump Primed; Aquifer Sustainability
- AAPG Environmental Regulatory Course
- Advanced Technologies for Accelerated Natural Attenuation
- Applied Microbiology Understanding Bacterial Augmentation, Montreal, Canada
- Baroid Industrial Drilling Products Drilling and Boring Fluids (Workshop)
- CWEA How to Start, Perform and Complete a Successful Public Works Water/Wastewater Project
- EPA Bioremediation of Hazardous Wastes: Research, Development, and Field Evaluations
- EPA Natural Attenuation; EPA Statistical Analysis of Ground Water Data (GRITSTAT)
- EPO/GRA Aquifer Remediation: Bioremediation and Oxidation Technologies
- · FEMA Advanced HAZUS Training for GIS Professionals
- Managing Toxics in Michigan Air, Waste and Remediation (Workshop)
- MGWA & MDPH Ground Water & Wells Fundamentals
- · Michigan Citizens Conference/Workshop on Great Lakes Areas of Concern
- NGWA Remediation of Ground Water Contamination
- NSF The Cutting Edge "Teaching Hydrogeology in the 21st Century"
- Protecting Water Quality through Land Use Planning & Zoning (Workshop)
- Reducing Risk in High Seismic Hazard Zones
- · Seismic Reflection/Refraction Interpretation (Workshop)

#### AFFILIATIONS

- California Groundwater Association
- California Hydrological Society
- Groundwater Resources Association of California
- International Association of Hydrogeology
- National Ground Water Association
- International Ground Source Heat Pump Association

#### VOLUNTEER WORK

- Santiago Middle School Taught Plate Tectonics and Science (2018)
- CSUF Alumni Fall Dinner (2013-present)
- CSUF Geology Research Day (2017-present)
- Science Olympiad Assistant (2013- present)
- · Elementary School presentations annually: "The Water Cycle"
- Little League: Coaching assistant, score keeper (2010 present)
- CSUF Gerontology Seminar Series (2005)
- Boy Scouts of America Troop, Identification of Rocks (2000 2008)
- NGWA Developed on-line Well Construction and Development Course (2004)
- El Dorado Nature Center Provided expertise for a variety of activities.
- National Sanitary Foundation Worked on task force to rewrite standards for water well materials.

1 DIANA J. CARLONI (SBN 100460) Attorney at Law 16195 Siskiyou Rd., Suite 130 Apple Valley, CA 92307 Telephone: (760) 946-9910 Facsimile: (760) 946-9920 2 OCT 0 1 2018 3 D. Williams 4 5 Attorney for Plaintiff, NEWBERRY SPRINGS RECREATIONAL LAKES ASSOCIATION 6 7 8 9 SUPERIOR COURT OF THE STATE OF CALIFORNIA 10 COUNTY OF RIVERSIDE 11 CITY OF BARSTOW, et al. CASE NO: CIV 208568 12 Plaintiffs, PROOF OF SERVICE 13 VS. 14 CITY OF ADELANTO, et al. 15 Hearing Information: Defendants, Date: October 12 2018 16 Time: 1:30 PM AND RELATED CROSS-ACTIONS Dept: 17 Before the Hon, Craig G. Riemer, Judge 18 19 I, JACKIE J, GRAY, DECLARE: 20 21 22 23 24 25 26 27 111 28

PROOF OF SERVICE

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## STATE OF CALIFORNIA, COUNTY OF SAN BERNARDINO

PROOF OF SERVICE

3

I am employed in the County of San Bernardino, State of California, I am over the age of 18 and not a party to the within action. My business address is 16195 Siskiyou Rd., Suite 130, Apple Valley, CA 92307.

By email or electronic transmission to the Watermaster and its counsel at the e-mail addresses listed

Services, a professional messenger service for service; A Declaration of Messenger will subsequently be filed; and Via, Watermaster to all parties to the action, pursuant to the Judgment of this case and the Mojave, Basin Area Watermaster's Rules and Regulations paragraph 8.B which provides that service to

obligation is satisfied upon delivery of a copy of the conformed documents as filed with the Court. As of today, the Watermaster has not set a service fee. Per the Watermaster's request, I will cause a check to

BY MAIL. I caused such envelope, as indicated on the addresses noted above and/or the attached service list, with postage thereon fully prepaid to be placed in the United States mail at San Bernardino, California. I am readily familiar with the firm's business practice for collection

and processing of correspondence for mailing with the United States Postal Service and that the foregoing document was placed for collection and mailing in accordance with ordinary business

below, and I did not receive, within a reasonable time after the transmission, any electronic message or

By messenger service to the Watermaster; I served the documents by emailing them Bosco Legal

be the responsibility of the Watermaster and paragraph 10.D, which provides that a party's service

be delivered to Watermaster upon being notified of the Watermaster's service costs.

practices pursuant to Code of Civil Procedure, Section 1013a.

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On October 1, 2018, I served the within documents described as NEWBERRY SPRINGS RECREATIONAL LAKES ASSOCIATION BRIEF IN RESPONSE TO THE STATUS CONFERENCE ORDER OF JULY 9, 2018; DECLARATION OF DR. W. RICHARD LATON, PG, Chg; DECLARATION OF DIANA J. CARLONI RE: STANDING AND THE RIGHT OF NEWBERRY SPRINGS RECREATIONAL LAKES ASSOCIATION TO APPEAR AND RESPOND TO THE STATUS CONFERENCE ORDER OF JULY 9, 2018; DECLARATION OF DR. W. RICHARD

LATON, PG, Chg - SUPPLEMENTING THE RESPONSE OF NEWBERRY SPRINGS RECREATIONAL LAKES ASSOCIATION TO THE STATUS CONFERENCE ORDER OF JULY 9.

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17 Watermaster Services Manager 13846 Conference Center Drive Apple Valley, CA 92307-4377

watermaster@mojavewater.org

[x]

Mojave Basin Area Watermaster

William J. Burnick Leland P. McElhaney

Brunick, McElhanev & Kennedy PLC

San Bernardino, CA 92408-3303 bbrunick@bmblawoffice.com

1839 Commercenter West

c/o Valerie L. Wiegenstein,

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[X](State) I declare under penalty of perjury pursuant to the laws of the State of California that the above is true and correct.

Executed on October 1, 2018, at Apple Valley, California.

2018, on the interested parties in this action, as follows:

other indication that the transmission was unsuccessful;

Jackie J. Gray

1

By:

## **PROOF OF SERVICE**

## STATE OF CALIFORNIA } COUNTY OF SAN BERNARDINO}

I am employed in the County of the San Bernardino, State of California. I am over the age of 18 and not a party to the within action; my business address is 13846 Conference Center Drive, Apple Valley, California 92307.

On October 1, 2018, the document(s) described below were served pursuant to the Mojave Basin Area Watermaster's Rules and Regulations paragraph 8.B.2 which provides for service by electronic mail upon election by the Party or paragraph 10.D, which provides that Watermaster shall mail a postcard describing each document being served, to each Party or its designee according to the official service list, a copy of which is attached hereto, and which shall be maintained by the Mojave Basin Area Watermaster pursuant to Paragraph 37 of the Judgment. Served documents will be posted to and maintained on the Mojave Water Agency's internet website for printing and/or download by Parties wishing to do so.

Document(s) filed with the court and served herein are described as follows:

NEWBERRY SPRINGS RECREATIONAL LAKES ASSOCIATION BRIEF IN RESPONSE TO THE STATUS CONFERENCE ORDER OF JULY 9, 2018; DECLARATION OF DR. W. RICHARD LATON, PG, Chg.

DECLARATION OF DR. W. RICHARD LATON, PG, Chg. SUPPLEMENTING THE RESPONSE OF NEWBERRY SPRINGS RECREATIONAL LAKES ASSOCIATION TO THE STATUS CONFERENCE ORDER OF JULY 9, 2018

DECLARATION OF DIANA J. CARLONI RE: STANDING AND THE RIGHT OF NEWBERRY SPRINGS RECREATIONAL LAKES ASSOCIATION TO APPEAR AND RESPOND TO THE STATUS CONFERENCE ORDER OF JULY 9, 2018

X (STATE) I declare under penalty of perjury under the laws of the State of California that the above is true and correct.

Executed on October 1, 2018 at Apple Valley, California.

Valerie Wiegenstein

35250 Yermo, LLC 11273 Palms Blvd., Ste. D. Los Angeles, CA 90066-2122

Attn: Roberto Munoz

Ades, John and Devon (via email) (DevonAdes@verizon.net)

Ahn Revocable Living Trust (via email) P. O. Box 45 Apple Valley, CA 92307-0001 Attn: Chun Soo and Wha Ja Ahn (chunsooahn@naver.com)

Ahn, Chun Soo and Wha Ja (via email) P. O. Box 45 Apple Valley, CA 92307-0001 Attn: Chun Soo Ahn (chunsooahn@naver.com)

Anderson, Ross C. and Betty J. 13853 Oakmont Dr. Victorville, CA 92395-4832

Apple Valley Unified School District 12555 Navajo Road Apple Valley, CA 92308-7256 Attn: Mathew Schulenberg

Aqua Capital Management, LP (via email) 7914 W. Dodge Rd., Ste. 482 Omaha, NE 68114-3417 Attn: David L. Penrice (dpenrice@acmwater.com)

Archibek, Eric 41717 Silver Valley Road Newberry Springs, CA 92365-9517

Atchison, Topeka, Santa Fe Railway Company (via email) 200 North Avenue H Barstow, CA 92311-2553 Attn: Dean Forshee (Dean.Forshee@bnsf.com)

Bar H Mutual Water Company (via email) P. O. Box 844 Lucerne Valley, CA 92356-0844 Attn: Daniel Shaw (barhwater@gmail.com) Abshire, David V. P. O. Box # 2059 Luceme Valley, CA 92356-2059 Attn: John McCallum

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Attn: Tom Stetson, P.E.

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## 1

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## STATE OF CALIFORNIA, COUNTY OF SAN BERNARDINO

PROOF OF SERVICE

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I am employed in the County of San Bernardino, State of California. I am over the age of 18 and not a party to the within action. My business address is 21001 N. Tatum Blvd., Suite 1630-455, Phoenix, AZ 85050.

On October 9, 2024, I served the within documents described as: Amended RESPONSE BY NEWBERRY SPRINGS RECREATIONAL LAKES ASSOCIATION TO GOLDEN STATE WATER COMPANY'S MOTION TO ENFORCE JUDGMENT; DECLARATION OF DR. W. RICHARD LATON, PG, CHG, SUPPORTING THE RESPONSE, on the interested parties in this action, as follows:

By email or electronic transmission to the Watermaster and its counsel at the e-mail addresses listed below, and I did not receive, within a reasonable time after the transmission, any electronic message or other indication that the transmission was unsuccessful; and

By messenger service to the Watermaster, the documents referred to hereinabove were personally delivered to the Watermaster by Rapid Attorney Service, a professional Service of Process/messenger service; A Declaration of Messenger will subsequently be filed; and Via, Watermaster to all parties to the action, pursuant to the Judgment of this case and the Mojave. Basin Area Watermaster's Rules and Regulations paragraph 8.B which provides that service to be the responsibility of the Watermaster and paragraph 10.D, which provides that a party's service obligation is satisfied upon delivery of a copy of the conformed documents as filed with the Court. As of today, the Watermaster has not set a service fee. Per the Watermaster's request, I will cause a check to be delivered to Watermaster upon being notified of the Watermaster's service costs.

Mojave Basin Area Watermaster c/o Valerie L. Wiegenstein, Watermaster Services Manager

13846 Conference Center Drive Apple Valley, CA 92307-4377 watermaster@mojavewater.org

vwiegenstein@MojaveWater.org iruesch@MojaveWater.org

William J. Brunick Leland P. McElhaney Brunick, McElhaney & Kennedy PLC

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(State) I declare under penalty of perjury pursuant to the laws of the State of California that the [X]above is true and correct.

Executed on October 9, 2024, at Hesperia, California.

By Jackie J. Gray

## PROOF OF SERVICE

# STATE OF CALIFORNIA } COUNTY OF SAN BERNARDINO}

I am employed in the County of the San Bernardino, State of California. I am over the age of 18 and not a party to the within action; my business address is 13846 Conference Center Drive, Apple Valley, California 92307.

On October 9, 2024, the document(s) described below were served pursuant to the Mojave Basin Area Watermaster's Rules and Regulations paragraph 8.B.2 which provides for service by electronic mail upon election by the Party or paragraph 10.D, which provides that Watermaster shall mail a postcard describing each document being served, to each Party or its designee according to the official service list, a copy of which is attached hereto, and which shall be maintained by the Mojave Basin Area Watermaster pursuant to Paragraph 37 of the Judgment. Served documents will be posted to and maintained on the Mojave Water Agency's internet website for printing and/or download by Parties wishing to do so.

Document(s) filed with the court and served herein are described as follows:

Amended RESPONSE BY NEWBERRY SPRINGS RECREATIONAL LAKES ASSOCIATION TO GOLDEN STATE WATER COMPANY'S MOTION TO ENFORCE JUDGEMENT; DECLARATION OF DR. W. RICHARD LAYTON, PG, CHG, SUPPORTING THE RESPONSE

X (STATE) I declare under penalty of perjury under the laws of the State of California that the above is true and correct.

Executed on October 9, 2024 at Apple Valley, California.

Mush

Jeffrey D. Ruesch

Attn: Roberto Munoz 35250 Yermo, LLC 11273 Palms Blvd., Ste. D. Los Angeles, CA 90066-2122 Attn: John McCallum Abshire, David V. PO Box # 2059 Lucerne Valley, CA 92356-2059 Attn: Jessie Florez Adelanto, City Of 11600 Air Expressway Adelanto, CA 92301-1914

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Attn: Ana Chavez

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Attn: Emely and Joe Saltmeris

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Attn: Remo E. Bastianon

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Bell, Charles H. Trust dated March 7, 2014

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