Results of the Great Salt Lake Dust Plume Study

(2016-2018)

Final Report

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April 2019

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Table of Contents

List of Figures

List of Tables

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Executive Summary

The elevation of the Great Salt Lake (GSL) has recently reached historically low levels due to a combination of water diversion and drought. Due to the shallow nature of the GSL, more than 750 square miles of lakebed are now exposed. As a result, dust plumes originating from the exposed lakebed have become common. These dust plumes have a significant impact on local air quality and have been shown to reduce the snowpack in the adjacent mountains due to enhanced melt rates. With more than 2 million residents living in close proximity to the GSL, there is also a concern that the dust plumes might pose a health hazard. It is for these reasons that the Utah Department of Natural Resources (Division of Forestry, Fire, and State Lands) and the Utah Division of Facilities Construction and Management funded this study to learn more about the GSL dust plumes.

The specific goals of the Great Salt Lake Dust Plume Study were to:

- Identify the GSL dust source regions (i.e., "hot spots"),
- Determine how frequently strong wind events occur along the Wasatch Front,
- Determine if the PM_{10} dust from the GSL contains heavy metals which might pose a threat to human health,
- Estimate how fluctuating lake levels might impact future dust production from the GSL, and
- Determine whether the composition of the dust from the GSL has been altered by local anthropogenic sources.

A systematic survey of all 757 square miles of the exposed GSL lakebed was undertaken between June 2016 and August 2018 using Incremental Sampling Methodology (ISM). Following ISM protocols, the lakebed was divided into 10 Decision Units (DUs) comprised of 122 Sub Units (SUs). Surface crust observations and soil samples from the top 1-2 cm were collected at a total of 5246 locations. Due to the heterogeneous nature of the lakebed, the soil samples from each SU were composited into 122 soil samples which were then dried, sieved, resuspended, and analyzed to determine the elemental mass fractions of the respirable particles (i.e., particles with diameters < 10 μm – PM_{10}). A combination of Inductively-Coupled Plasma Mass Spectrometry (ICPMS) and Synchrotron X-ray Fluorescence (SXRF) provided mass fraction measurements for 53 different elements.

GSL dust plume "hot spots" were identified as locations that had visible fine particles which could be easily displaced, had little or no vegetation, and had either no surface crust or an erodible shallow crust. Dust "hot spots" matching these criteria were identified in all four quadrants of the GSL and comprised about 9% of the total lakebed. 73% of the lakebed is currently protected from wind erosion by shallow, moderate, or thick surface crusts while 15% of the lakebed is covered by some vegetation. If all of the protective crusts were destroyed by human activities or natural erosion, the dust "hot spots" would increase to a maximum of 22% of the exposed lakebed. On average, the GSL lakebed is composed of 95% sand and 5% silt and

clay. It is the areas of the lakebed which have higher silt and clay fractions which are most susceptible to wind erosion.

A review of 10 years of meteorological data from stations near the GSL revealed several weather patterns associated with high wind events. These weather patterns include: prefrontal southerly flow, postfrontal northwesterly flow, easterly downslope windstorms, and outflows from thunderstorms. On average, high wind events (i.e., ≥ 11 m s^{-1}) near the GSL occurred on 44 days every year totaling about 1.1% of all observations. This value should be viewed as an upper bound for exposure to GSL dust plumes (assuming that 11 m s^{-1} is an appropriate threshold wind velocity) because the creation of dust plumes requires both strong winds and dry soil conditions.

The PM_{10} soil from the GSL lakebed is highly enriched in elements associated with evaporite minerals (e.g., boron, calcium, chlorine, lithium, magnesium, sulfur, and strontium). Of the 53 elements measured using ICPMS and SXRF, only nine had some values which exceeded the Residential Regional Screening Levels (RSLs) established by the U.S. Environmental Protection Agency (EPA). These nine elements included antimony, arsenic, cobalt, copper, lanthanum, lithium, manganese, vanadium, and zirconium. Four of these elements (arsenic, lanthanum, lithium, and zirconium) also had some values which exceeded the Industrial RSLs established by the EPA. Elements which exceed the RSLs do not necessarily pose a health risk to adjacent populations because the exposure frequency used in the RSL calculations is extremely conservative. To determine the actual health risk, a site-specific exposure assessment for these nine elements should be performed. It should also be noted that this study did not investigate the impact of GSL dust plumes on the local PM_{10} or $PM_{2.5}$ concentrations. Exposure to these criteria air pollutants could pose a health risk independent of the individual particulate matter constituents if the ambient concentrations exceed the National Ambient Air Quality Standards (NAAQS) established by the EPA.

The locations of all the GSL dust “hot spots” were combined with a digital elevation model (DEM) derived from aircraft LiDAR measurements to determine how fluctuations in the lake elevation might impact dust production. It was determined that the number of dust “hot spots” varies linearly with lake elevation in all quadrants of the GSL. The number of dust “hot spots” in Farmington Bay will be reduced by 13.8% per foot for lake elevations above 4195 ft. The number of dust “hot spots” in Bear River Bay will be reduced by 12.8% per foot for lake elevations above 4200 ft. The number of dust “hot spots” in Gilbert Bay will be reduced by 11.7% per foot for lake elevations above 4196 ft. The number of dust “hot spots” in Gunnison Bay will be reduced by 7.3% per foot for lake elevations above 4197 ft. The GSL elevation is currently so low that further reductions are unlikely to increase the number of dust hot spots in Farmington, Bear River, or Gunnison Bays. However, the number of dust “hot spots” in Gilbert Bay will likely increase at a rate of 11.7% per foot of lake decline. It should be noted that the number of dust “hot spots” may increase over time independent of lake levels if the protective surface crusts are destroyed by human activity or erode naturally over time.

The spatial variability of the PM_{10} soil elemental mass fractions was used to infer the presence or absence of significant anthropogenic contamination of the GSL lakebed. The elements with the greatest spatial variability included copper, sulfur, silver, phosphorus, chlorine, molybdenum, zirconium, and lead. Four of these elements (e.g., copper, silver, molybdenum, and sulfur) peaked in the area immediately north of the Kennecott Utah Copper (KUC) tailings pile located on the south shore of the GSL. Elevated phosphorus concentrations in Bear River and Farmington Bays most likely result from fertilizer runoff. Live-fire activities at the Utah Test and Training Range (UTTR) on the western side of the GSL have elevated both the phosphorous and zirconium concentrations in the adjacent lakebed. Several elements including antimony, cadmium, chromium, lead, selenium, and zinc peaked in Farmington Bay. The elements with the most uniform concentrations included barium, magnesium, uranium, calcium, cobalt, selenium, arsenic, zinc, antimony, and lithium.

1. Introduction

1.1 Background

History has shown that the combination of climate change, drought, and water diversion can quickly reduce once thriving lake ecosystems to a fraction of their former sizes. Recent examples include the Aral Sea, Lake Chad, Lake Urmia, Lake Poopo, Owens Lake, and the Dead Sea. As these water bodies dried up, entire ecosystems were disrupted, industries were shuttered, economies were threatened, new pollution sources (i.e., dust plumes) were created, and local populations suffered.

Most of these lakes were unintentionally depleted in a similar pattern. Drought conditions and increasing local populations put additional pressure on existing water resources resulting in increased water diversion (often for agricultural purposes). This water diversion resulted in a significant, but reversible, decrease in lake levels. Unfortunately, local governments failed to take corrective action in time and the lake ecosystems were destroyed. Once a lake has dried up, the dependent species disappear and the local hydrological cycle is disrupted. Less precipitation in the watershed makes it very hard to reverse the trend and restore the lake to its previous water levels. Worse yet, the dependent species are likely to remain absent for decades even if the lake levels are restored.

Owens Lake, in California, is the only one of the aforementioned lakes which was intentionally desiccated. The City of Los Angeles, which owned the water rights, diverted all of the water on purpose to meet the needs of its growing population. As a result, Owens Lake dried up completely in 1926. Shortly thereafter, Owens "dry" Lake became the largest source of PM_{10} pollution in North America. As it turns out, the fine silt located on the exposed lakebed was easily erodible due to the dry conditions and strong winds that commonly occur on the lee side of the Sierra Nevada Mountains. To make matters worse, chemical composition measurements of the dust plumes originating from the exposed portions of the lakebed showed that the particulate matter contained very high concentrations of arsenic. This posed an unanticipated health hazard to downwind residents above and beyond those associated with PM_{10} concentrations that drastically exceeded the National Ambient Air Quality Standards (NAAQS) established by the U.S. Environmental Protection Agency (EPA) to protect human health. To date, the City of Los Angeles has spent more than $1.3 billion dollars on dust mitigation but has not yet managed to eliminate the problem.

With the Great Salt Lake (GSL) at historically low levels (Figs. 1.1 and 1.2) and additional water diversion projects under consideration (e.g., Bear River Development Project), residents along the Wasatch front are becoming increasingly concerned about the future of the lake ecosystem. The GSL provides crucial habitat for migratory birds, supports the brine shrimp and mineral extraction industries, and provides extensive recreation opportunities for boaters, bikers, birders, hikers, and hunters. Altogether, it is estimated that the GSL provides approximately $1.32 billion in economic benefits to the State of Utah annually. As the lake level continues to drop, it exposes more lakebed which increases the likelihood that residents along the Wasatch Front will be exposed to potentially unhealthy concentrations of PM_{10} and $PM_{2.5}$ originating from wind-blown dust.

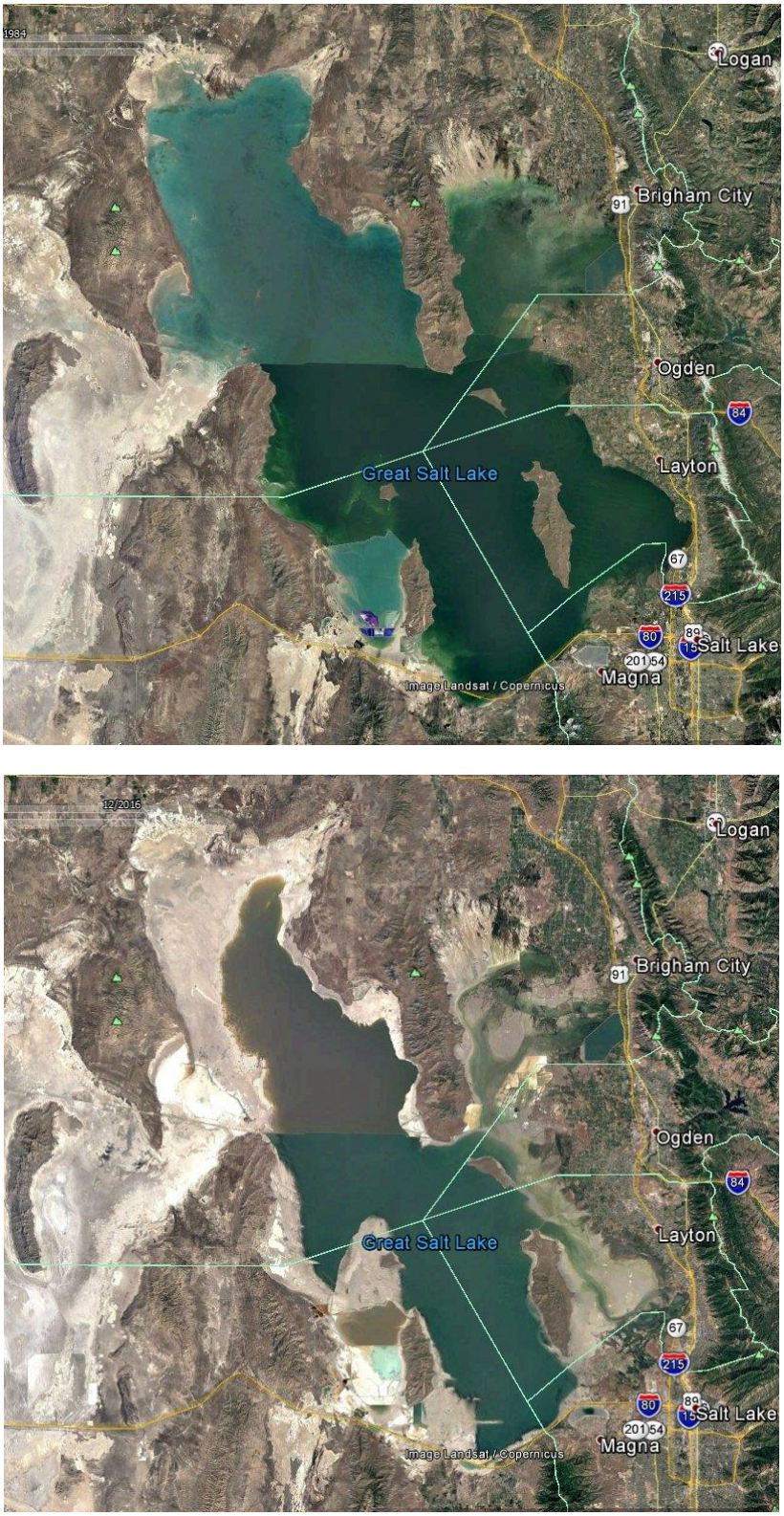

Figure 1.1 Satellite images of the Great Salt Lake from December 1984 (top) and December 2016 (bottom) showing the dramatic decrease in the surface area of the lake.

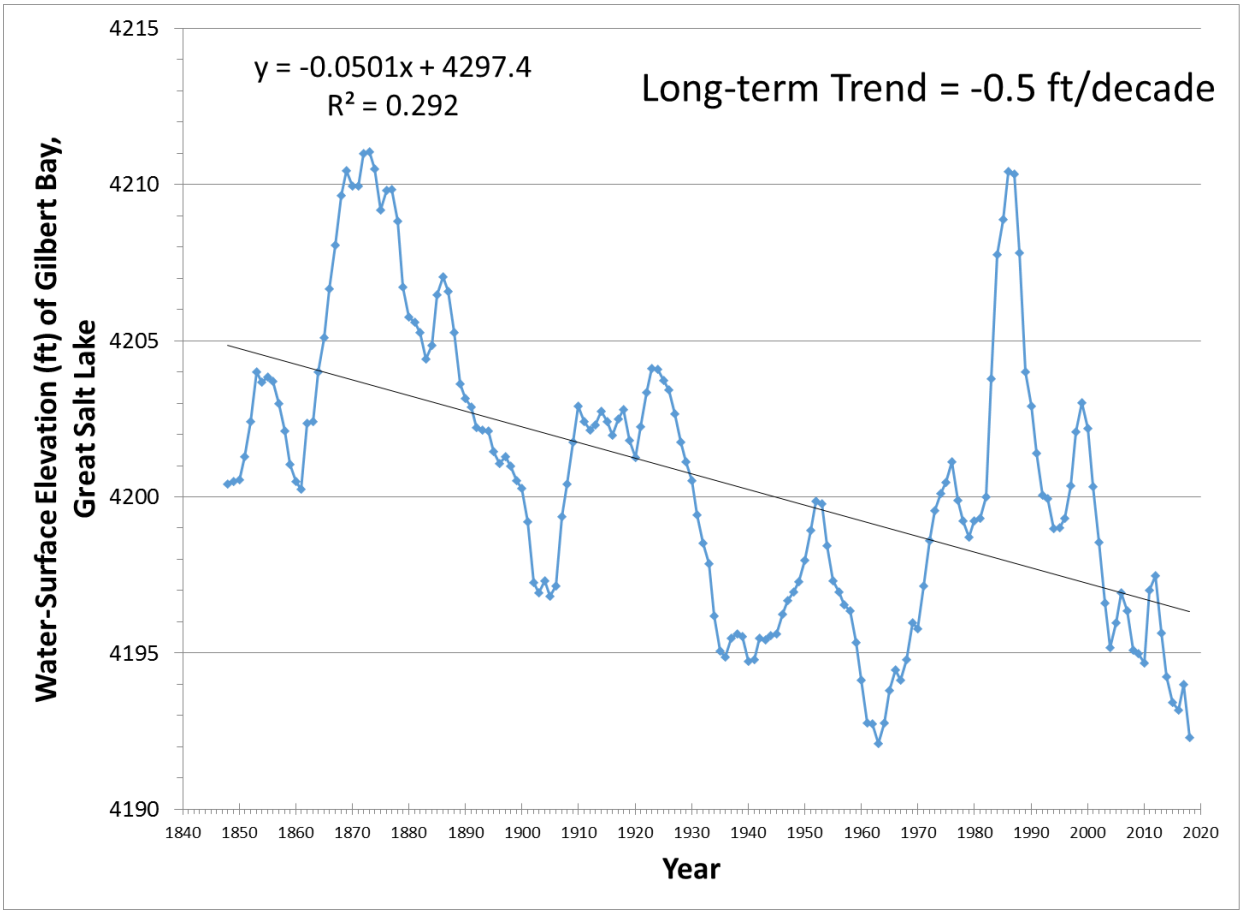

Figure 1.2 Fluctuation in water-surface elevation for Gilbert Bay (south part), Great Salt Lake, 1848 to 2018 (US Geological Survey: https://waterdata.usgs.gov/ut/nwis/annual?referred_module=sw&search_site_no=10010000&format=sites_selection_links).

The Great Salt Lake Basin includes much of Utah, parts of southeastern Idaho, southwestern Wyoming and eastern Nevada. The GSL, which drains approximately 55,000 km^2 (21,445 mi^2), is the largest terminal lake within the Great Salt Lake Basin. The elevation of the GSL is controlled by the ratio of the inflow to the outflow (Fig. 1.3). The primary inflows are from the Bear, Weber and Jordan rivers. Together, these rivers provide an average of 2 million acre-feet of water annually to the GSL. Additional inflow pathways include direct precipitation and groundwater discharge. As a terminal lake, there are no stream outlets for the GSL and the primary outflow is through evaporation. Additional outflow pathways include groundwater recharge and pumping for mineral extraction. Figure 1.2 shows that the long-term trend (1850-present) in GSL elevation is -0.5 ft per decade.

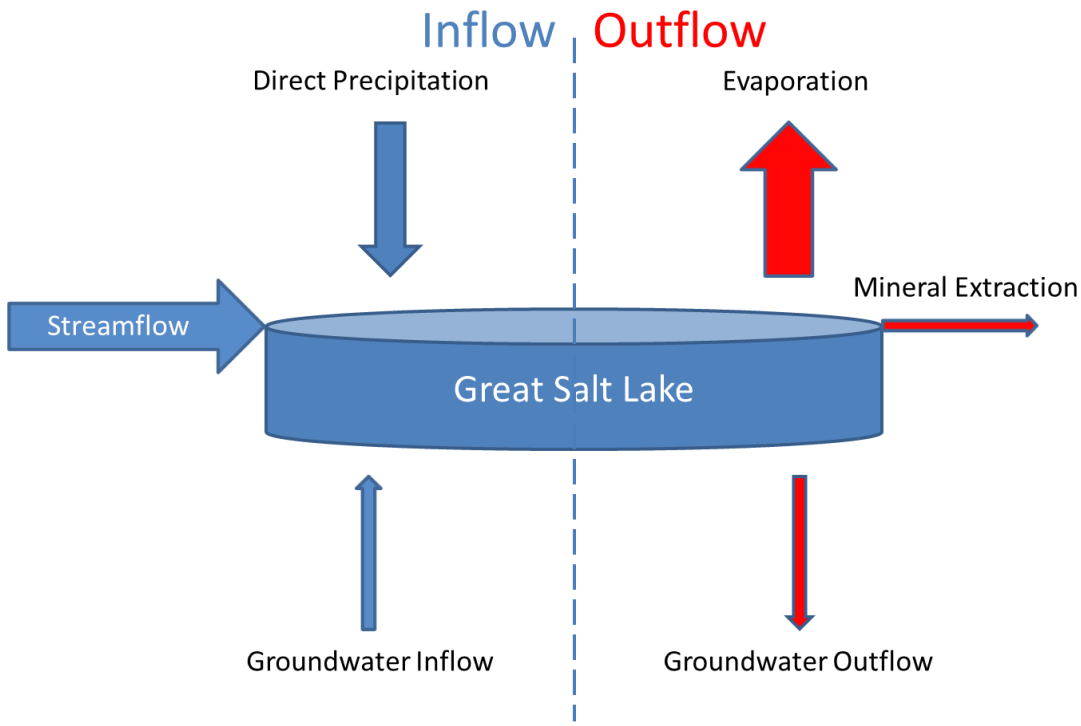

Figure 1.3 Diagram showing the major inflows and outflows of water to the Great Salt Lake. When Inflow > Outflow the lake level will rise. When Inflow < Outflow the lake level will decrease.

A common misperception is that the long-term reduction in the GSL elevation is due to changes in precipitation patterns. A study completed by researchers at Utah State University (*Wurtsbaugh et al.,* 2017) examined the mean stream flow of the Bear river and one of its main tributaries using a combination of tree-ring estimates and direct stream-gauge measurements. Their analysis indicated that there has been no long-term (i.e., 1850 – present) stream flow decreases in the Bear river drainage at locations above existing water diversion structures (Fig. 1.4a). Thus, the long-term decreasing trend in the GSL elevation (Fig. 1.2) cannot be explained by precipitation decreases in the Bear River drainage basin. *Wurtsbaugh et al* (2017) also estimated the consumptive use of water for agriculture, salt ponds, wetlands and cities (Fig. 1.4b) to determine the net impact of water diversions on the GSL elevation (Fig. 1.4c). Their analysis revealed that, in the absence of water diversion, there would be no long-term decrease in the GSL elevation and that the mean natural elevation of the GSL is 4207 ft. They concluded that consumptive water uses have lowered the lake by 11 ft and decreased its volume by 48% relative to the mean natural elevation. Table 1.1 shows how each type of water diversion contributed to the GSL elevation decrease. The current GSL elevation (~4192 ft as of December 2018) is 15 ft lower than the mean natural elevation of 4207 ft. Thus, the *Wurtsbaugh et al.* (2017) analysis attributes almost ~75% of this decrease to water diversion with the remaining ~25% due to short-term precipitation fluctuations. *Wurtsbaugh et al.* (2017) goes on to conclude that water diversions must decrease by 24-29% in order to stabilize the GSL elevation and stop the long-term downward trend shown in Figure 1.2.

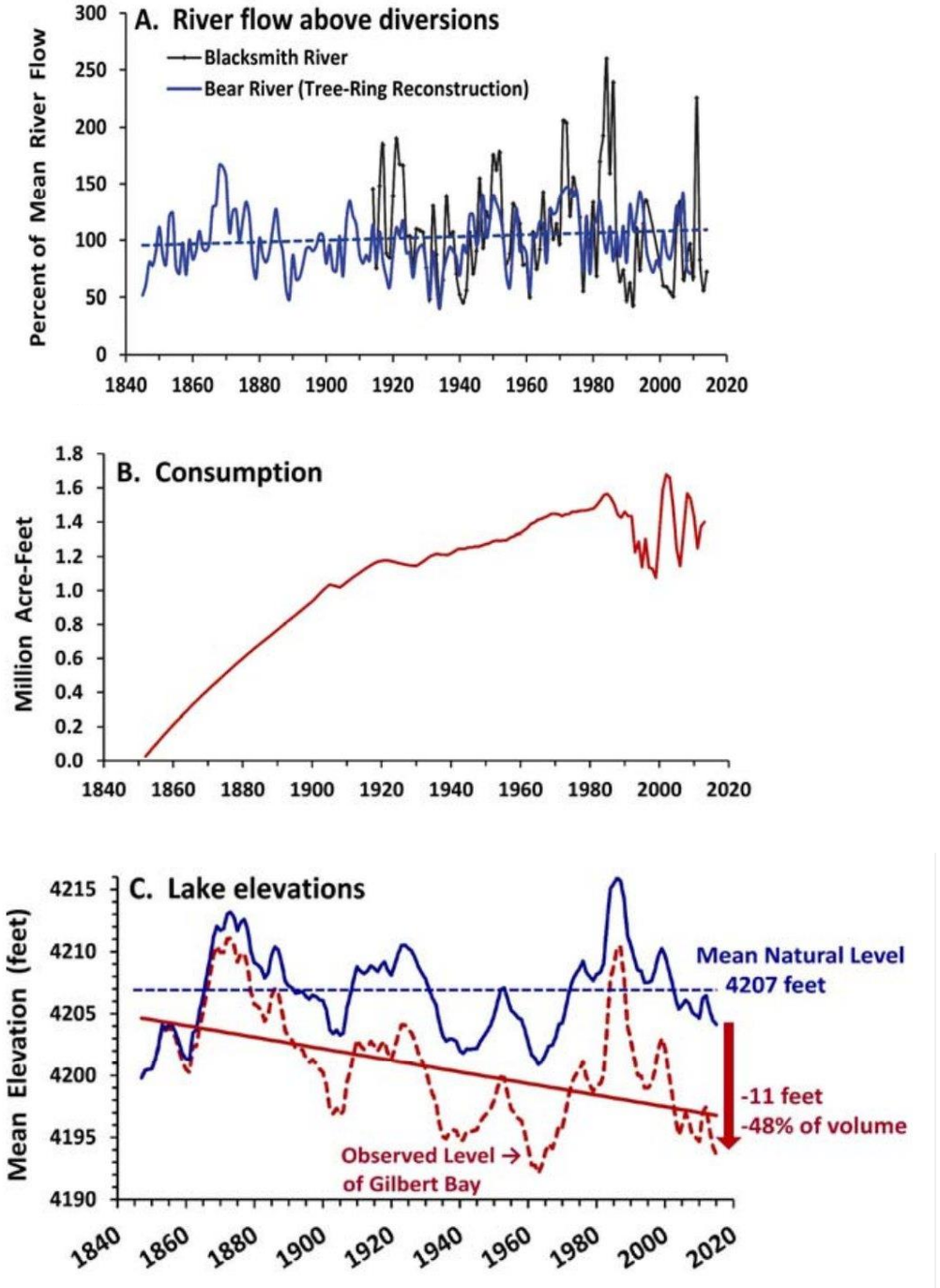

Figure 1.4 Temporal changes in water inputs, water use, and elevation of the Great Salt Lake. a) water flow in GSL headwater streams above diversions, b) estimated consumptive use of water for agriculture, salt ponds, wetlands, and cities, and c) observed level of the GSL (red line) with the modelled lake elevation in the absence of consumptive water (blue line) **[Source: Wurtsbaugh et al., 2017]**

Table 1.1 Impact of Water Diversions on GSL Elevation (*Wurtsbaugh et al.*, 2016).

Water Diversion Purpose	Percent Water Diversion	Estimated Effect on Lake Level
Agriculture	63%	-7.0 ft
Mineral Extraction	13%	-1.4 ft
Municipal & Industrial	11%	-1.3 ft
Impounded Wetlands	10%	-1.1 ft
Reservoir Evaporation	3%	-0.3 ft

1.2 Motivation

Dust plumes originating from the exposed lakebed (i.e. playa) of the GSL have increased in frequency and severity over the last decade as the lake has receded. These dust events are most commonly initiated by strong winds associated with the passage of a cold front (Fig. 1.5), but can also result from thunderstorm downdrafts (Fig. 1.6). Smaller amounts of dust can be lofted by whirlwinds known as dust devils which are common during hot and dry conditions. The images shown in Figure 1.5 demonstrate how severely the air quality in Salt Lake City can be impacted by GSL dust plumes associated with a cold frontal passage. In this example, which took place during the afternoon of November 16, 2016, visibility was reduced to less than 4 miles at the Salt Lake City International airport. In addition, the 24-hr averaged PM_{10} concentration measured at the Utah Division of Air Quality (DAQ) site at Hawthorne Elementary School in Salt Lake City was 66 $\mu g\ m^{-3}$ even though the dust event only lasted a few hours.

Even though the exposed lakebed of the GSL is recognized as a potentially significant local/regional dust source, little research has been conducted to quantify the air quality impacts or to characterize the specific meteorological conditions and threshold wind velocities capable of lofting the dust. In addition, the specific source regions within the expansive playa have not yet been identified through a systematic survey of the soil surface characteristics and particle size distributions. Without these types of information, it is extremely difficult to accurately model past dust episodes or to predict the occurrence of future dust plumes. More disturbing is the fact that we do not know the chemical composition of the dust that is currently being lofted from the GSL playa. Without chemical composition and accurate PM_{10} measurements of the GSL dust sources, estimating the potential health impacts is impossible. Managers of the GSL need the types of information described above to make informed decisions which balance the needs of the stakeholders and the health of the two million people living adjacent to the lake.

1.3 Scope of Study

The Great Salt Lake Dust Plume Study was jointly funded by the Utah Department of Natural Resources (DNR) and the Utah Division of Facilities Construction and Management (DFCM). However, the two state agencies had very different motivations. The DNR was seeking information about the dust sources which could be used for informed management decisions. The DNR was also curious whether the mineral dust from the GSL contained heavy metals at concentrations which could be potentially harmful to adjacent populations. On the other hand, the DFCM wanted to know if dust from the GSL transported to the new Utah State Correction Facility site (on the south shore of the GSL west of the SLC airport) posed a hazard unique to the site.

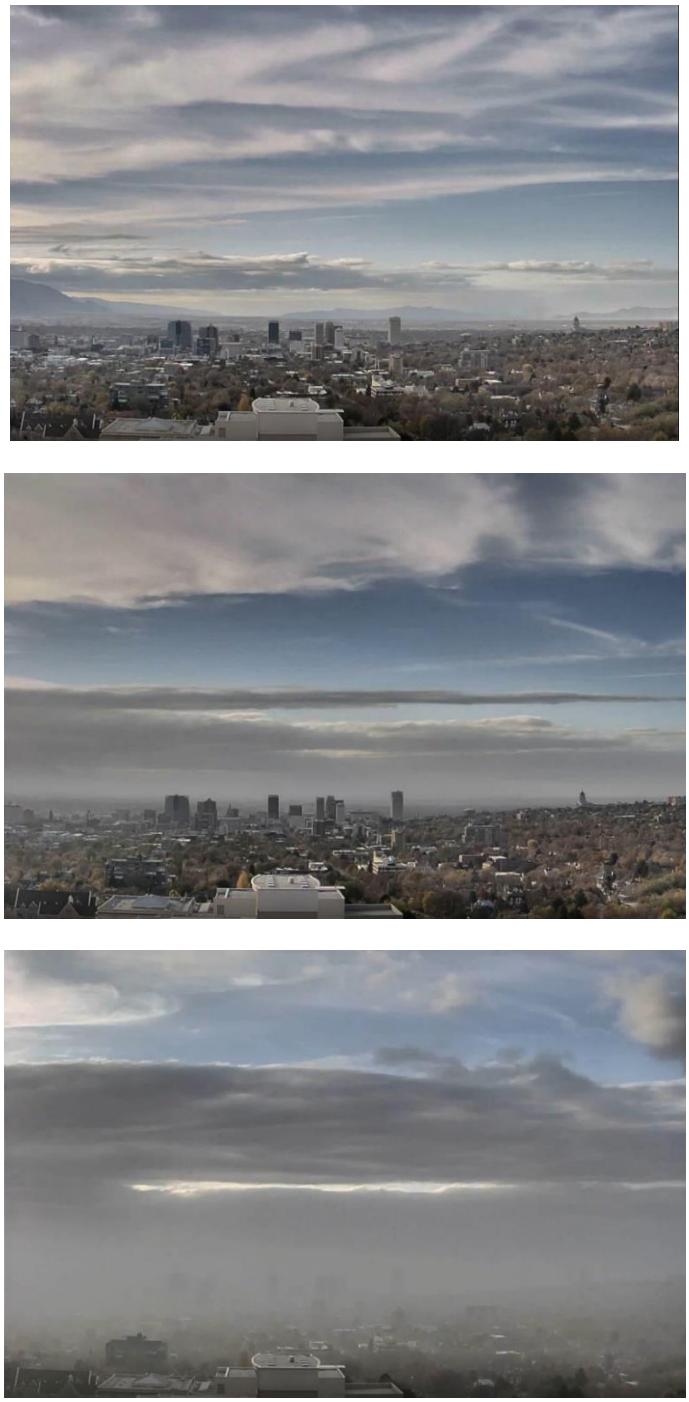

Figure 1.5 Example of a dust plume from the Great Salt Lake impacting the air quality in downtown Salt Lake City on November 16, 2016. These images were captured from a webcam mounted on the roof of the William Browning Building on the University of Utah campus looking west. The Great Salt Lake is on the right side of the image and the wind was blowing from the north (i.e., right to left) after the passage of a cold front. The images were captured at 15:17:40 MDT (top) 15:48:00 MDT (center), and 16:20:18 MDT (bottom), respectively.

Figure 1.6 Example of a dust plume from the Great Salt Lake playa generated by a thunderstorm downdraft. Photo taken on July 30, 2017 on the northern portion of Gunnison Bay directly south of the Locomotive Springs Waterfowl Management Area. View is to the west.

1.4 Goals

The specific goals of the Great Salt Lake Dust Plume Study included:

- Identifying the GSL dust source regions (i.e., "hot spots"),
- Determining how frequently strong wind events occur along the Wasatch Front,
- Determining if the PM_{10} dust from the GSL contains heavy metals which might pose a threat to human health,
- Estimating how fluctuating lake levels might impact future dust production from the GSL, and
- Determining whether the composition of the dust from the GSL has been altered by local anthropogenic sources.

2. Where Do Great Salt Lake Dust Plumes Originate?

2.1 Methodology

To determine the dust source regions, a systematic survey of the entire exposed GSL lakebed was undertaken using Incremental Sampling Methodology (ISM).

> *"ISM is a structured composite sampling and processing protocol that reduces data variability and provides a reasonably unbiased estimate of mean contaminant concentrations in a volume of soil targeted for sampling. ISM provides representative samples of specific soil volumes defined as decision units (DUs) by collecting numerous increments of soil (typically 30–100 increments) that are combined, processed, and subsampled according to specific protocols."* (*Interstate Technology & Regulatory Council*, 2012)

The total surface area of the exposed portions of the GSL lakebed is very sensitive to the lake elevation but was ~750 mi^2 at the conclusion of this study when the lake elevation was 4192 ft. Due to the extremely large size of the survey area, the GSL was divided into 10 Decision Units (DUs) (Fig. 2.1). Each of these DUs were further subdivided into Sub Units (SUs) with an average size of ~6 mi^2 (Appendix A). A total of 122 SUs were sampled for this study (Table 2.1)

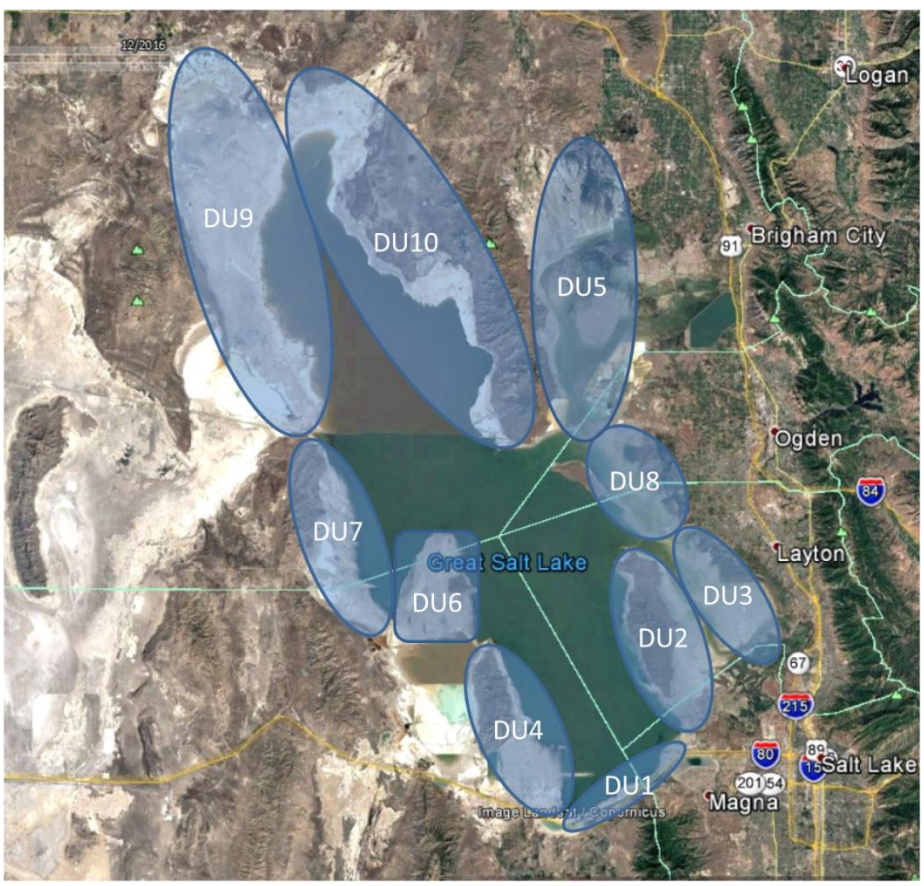

Figure 2.1 Map showing how the Great Salt Lake was divided into 10 Decision Units (DUs) for this study.

Table 2.1 Summary of Incremental Sampling Methodology (ISM) Decision Units (DUs).

Decision Unit	# of Sub Units	Surface Area (mi^2)	# Samples	Grid Spacing (meters)	# Samples per mi^2	Average # Samples per Sub Unit
1	7	15.2	390	250	25.7	56
2	14	56.2	585	500	10.4	42
3	10	43.9	376	500	8.6	38
4	13	54.9	497	500	9.1	38
5	14	87.6	557	500	6.4	43
6	11	63.1	522	500	8.3	47
7	9	66.1	335	500	5.1	37
8	6	28.5	225	500	7.9	38
9	23	257.1	1037	750	4.0	45
10	15	85.0	722	500	8.5	48
Total =	**122**	**757.6**	**5246**			

ISM dictates that each SU be divided into a grid with 30-100 samples per SU. The grid spacing for each DU was chosen to ensure that the minimum number of 30 samples were collected, on average, in each SU. Most of the DUs were sampled with a grid spacing of 500m. However, the grid spacing in the smallest and largest DUs (i.e., DU1 and DU9) had to be adjusted to 250m and 750m, respectively to maintain consistency in the average number of samples per SU. Using a predetermined grid to identify the GPS coordinates of each soil sample prior to collection minimized selection bias. Information bias was minimized by having one individual (Dr. Kevin Perry) collect all of the soil samples and surface crust observations for this study.

To minimize the disturbance of the surface crust, all but one of the SUs were sampled using a bicycle/trailer system (Fig. 2.2). The only exception was the portion of the GSL lakebed within the boundaries of the Utah Test and Training Range (UTTR). The UTTR is a military training facility for air-to-air combat, air-to-ground inert and live practice bombing, and gunnery training by Department of Defense aircrews. The possibility of encountering unexploded ordinance necessitated a military escort and sample collection using an all-terrain vehicle (ATV). Figure 2.2 clearly shows that ATV travel on the playa leaves much more noticeable tracks than the bicycle/trailer system. This figure also shows an example of the significant damage done to the playa in the process of extracting a stuck military ATV. Other advantages of the bicycle/trailer system included its lower cost, a reduced likelihood of getting stuck, and a more nuanced feel for subtle differences in surface crust characteristics. The major disadvantages of the bicycle/trailer system were that it was slow, physically challenging, and required at least five, rain-free days prior to sampling.

The fieldwork for the Great Salt Lake Dust Study commenced on June 16, 2016 and concluded on August 8, 2018. The study required 122 trips to the GSL and 2,300 miles on the bicycle. Approximately 10% of the lakebed (i.e., 230 miles) was not rideable and required pushing the bicycle/trailer through extremely soft and/or muddy conditions. Figure 2.3 shows that the GSL

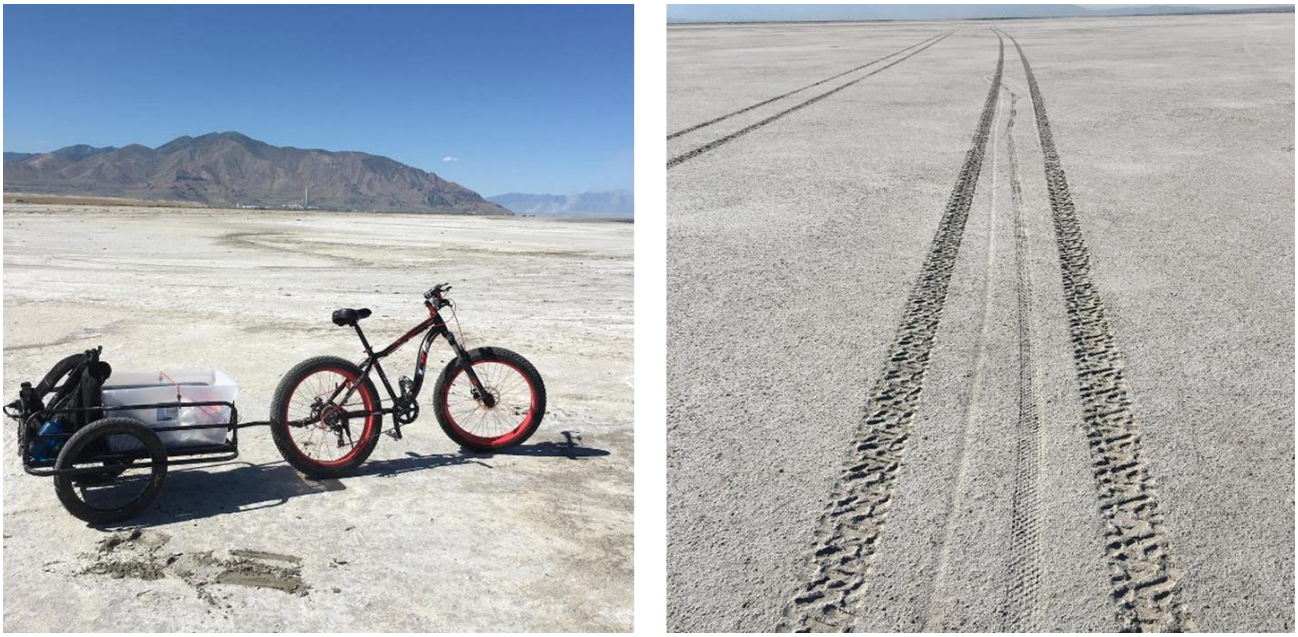

Figure 2.2 The University of Utah "Dust Devil" bicycle/trailer used in this study (top left). Comparison of the tracks left by an all-terrain vehicle (ATV) and the bicycle/trailer (top right). Damage done to the playa extracting an ATV which had become stuck (bottom).

elevation in the northern and southern portions of the lake varied by approximately 5.25 feet and 3.25 feet, respectively during the 26-month sampling period. The GSL is physically divided into two halves by the railroad causeway which transects the entire lake from east to west. Although there are breaks in the causeway designed to permit water exchange, the influx of water from the tributary streams (i.e., Bear River, Weber River, and Jordan River) ensures that the elevation in the southern arm of the GSL is always greater than in the northern arm. However, by late 2016 the lake levels had dropped so low that the existing causeway breaks no longer permitted water exchange. Connectivity was reestablished on December 1, 2016 with the construction of a new causeway break causing a rapid increase in the elevation of the northern arm prior to the normal spring run-off.

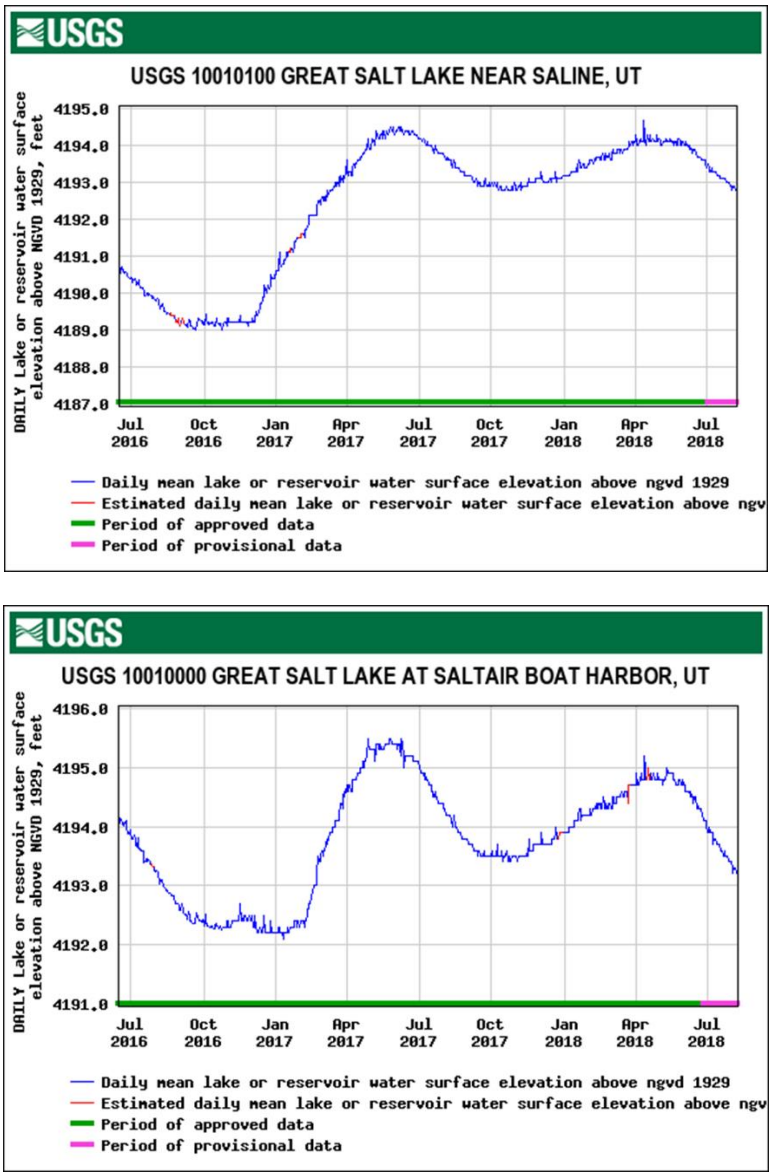

Figure 2.3 Lake elevations measured in the northern (top) and southern (bottom) arms of the GSL during the Great Salt Lake Dust Study. (Source: US Geological Survey)

Three soil samples were collected at each ISM survey location. Two samples of the surface crust (top 2cm or less) were collected within 1m of each other. These were designated as Samples A and B and represent the surface crust, if present. A third, subsurface sample, designated as Sub, was collected from a depth of 2-4 cm. The subsurface samples, which were not analyzed as part of this study, represent the soil that would be exposed to the atmosphere for possible wind erosion if the current surface material/crust is deflated. The A, B, and Sub soil samples from each ISM survey location within a SU were composited into separate 2.5-gallon, Ziplock bags. The three, composited soil samples from each SU were then returned to the lab at the University of Utah where they were prepped for analysis. Each sample was dried in an oven at 105°C (for a period of at least 24 hours), manually disaggregated using a pestle, and sieved in ~1kg increments for a period of 1 hour using the following standard mesh sizes: #4, #10, #20, #40, #60, #100, #140, and #200. The soil particle size distribution was then determined by weighing each of the sieved size fractions. The particle size distributions for the A and B samples were remarkably similar with a slope, intercept, and correlation coefficient (R^2) of 0.96, 0.46, and 0.95, respectively (Fig. 2.4). The good correlation between the A and B samples indicates that the particle size distributions were relatively homogeneous at the 1m scale and that the ISM soil collection and analytical procedures did not introduce any biases into the resultant particle size distributions.

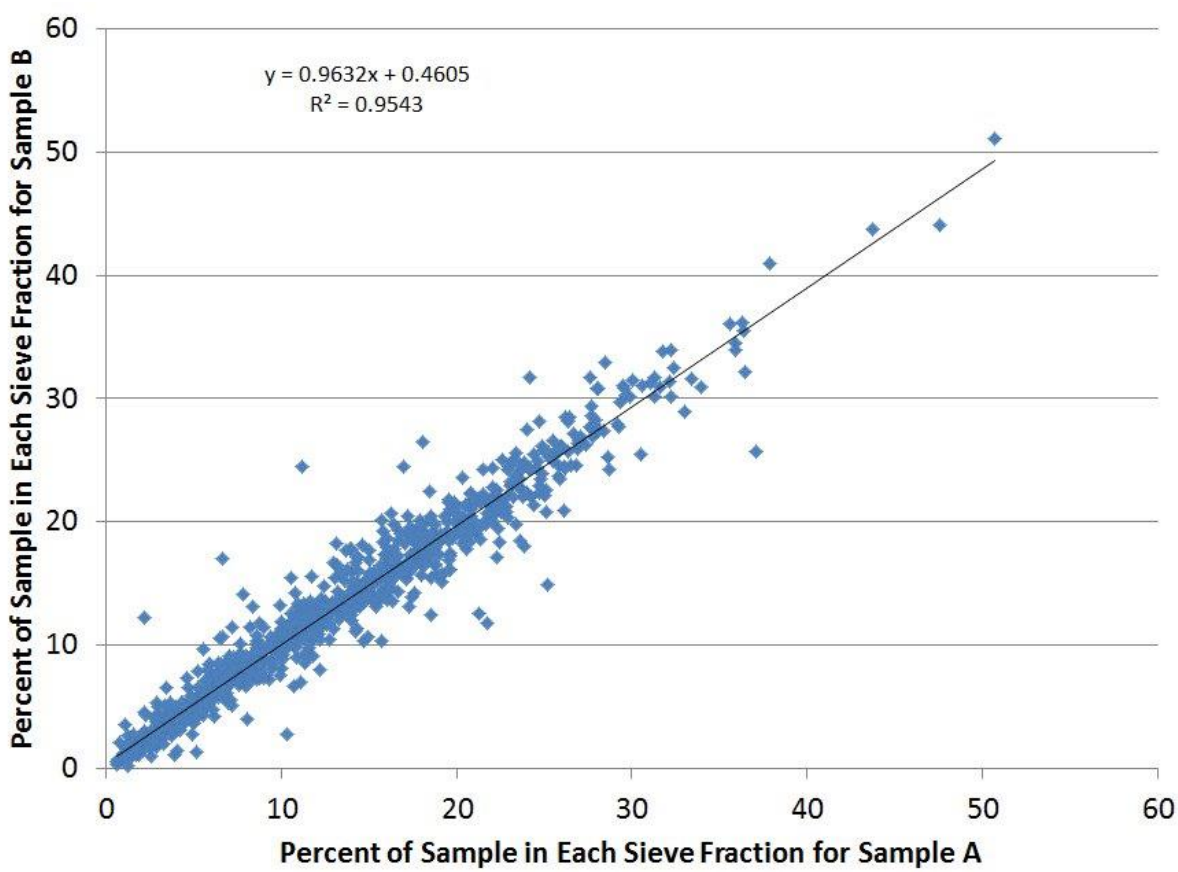

Figure 2.4 Comparison of the percent of soil in each sieve fraction for all of the A and B (surface crust) samples.

2.2 Soil Texture Analysis

Soil with a high fraction of silt and clay is generally more susceptible to wind erosion than soils primarily composed of sand. The reason for this is that even very fine sand is quickly removed from the atmosphere via gravitational settling. In contrast, silt and clay can be transported long distances because the particles are smaller and gravitational settling velocities are insufficient to quickly remove these particles from the atmosphere. *Wentworth* (1922) defined sand as particles with diameters between 2 mm and 62 μm, silt as particles with diameters between 62 and 4 μm, and clay as particles with diameters < 4 μm. Particles larger than sand are referred to as pebbles, cobbles, or boulders. Table 2.2 shows how the sieves used in this study correlate with the *Wentworth* (1922) classification system. The largest sieve (#4) captured the boulders, cobbles, and most of the pebbles. Sieve (#10) captured the very fine pebbles (i.e., granules). The rest of the sieves captured various size classifications of sand. Silt and clay particles are those that were small enough to pass through sieve #200. The fraction of silt and clay (excluding boulders, cobbles, and coarse pebbles) for each SU was determined by dividing the mass of particles passing through sieve #200 by the sum of the mass of the particles collected on sieves #10 through #200. The results from the A and B samples were then averaged to get the final estimates of the fine (i.e., silt and clay) fraction of the soil.

Table 2.2 Soil Classification System Used in this Study [Based on *Wentworth* (1922)].

ASTM Sieve Size Number (U.S. Standard)	Lowest Diameter Size Ranges	Classification
4	4.76 mm	Boulders + Cobbles + Pebbles
10	2.00 mm	Very Fine Pebbles (granules)
20	840 μm	Very Coarse Sand
40	420 μm	Coarse Sand
60	250 μm	Medium Sand
100	149 μm	Fine Sand
140	105 μm	Fine Sand
200	74 μm	Very Fine Sand
> 200	< 74 μm	Silt + Clay

The results of the particle size analysis revealed that, on average, the GSL lakebed soil samples have a very low silt and clay content (Fig. 2.5). This means that the GSL playa is primarily composed of various size fractions of sand and is, therefore, less prone to wind erosion than many other regional dust sources. The median silt and clay fraction of 3.8% indicates that 50% of the soil samples were composed of more than 96.2% sand. There are, however, several areas of the lakebed with substantial fine material available for dust generation (Figs. 2.6 and 2.7). The highest silt and clay percentages were observed in DU3 (on the eastern side of Farmington Bay in the SE quadrant of the lake), in DU5 (Bear River Bay in the NE quadrant of the lake), and in DU8 (Ogden Bay on the eastern side of the lake). Each of these DUs are located near the mouth of a river (e.g., DU3 = Jordan River, DU5 = Bear River, and DU8 = Weber River). The southern portion of DU2 (south of Antelope Island) also has higher than average amounts of

fine material due to its proximity to the mouth of the Jordan River. Fig. 2.7 also shows that most bayheads have higher percentages of fine material than the remainder of the DU. This is most evident in DU9 (i.e., the extreme NW quadrant of the lake) and to a lesser extent in DU4, DU7, and DU10. There is also an isolated pocket of fine material at the mouth of Goggin Drain (a Jordan River surplus canal) in DU1-SU7.

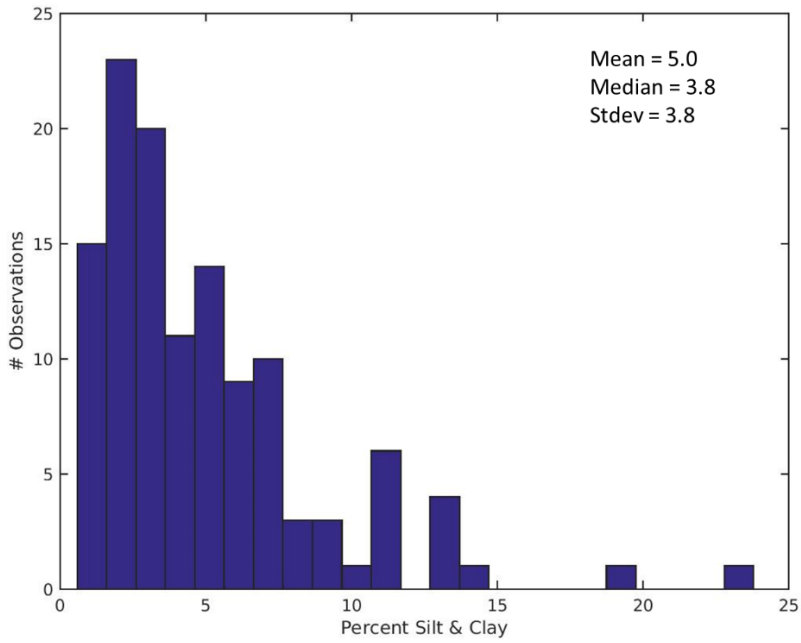

Figure 2.5 Histogram of the silt and clay percentages for the entire GSL lakebed.

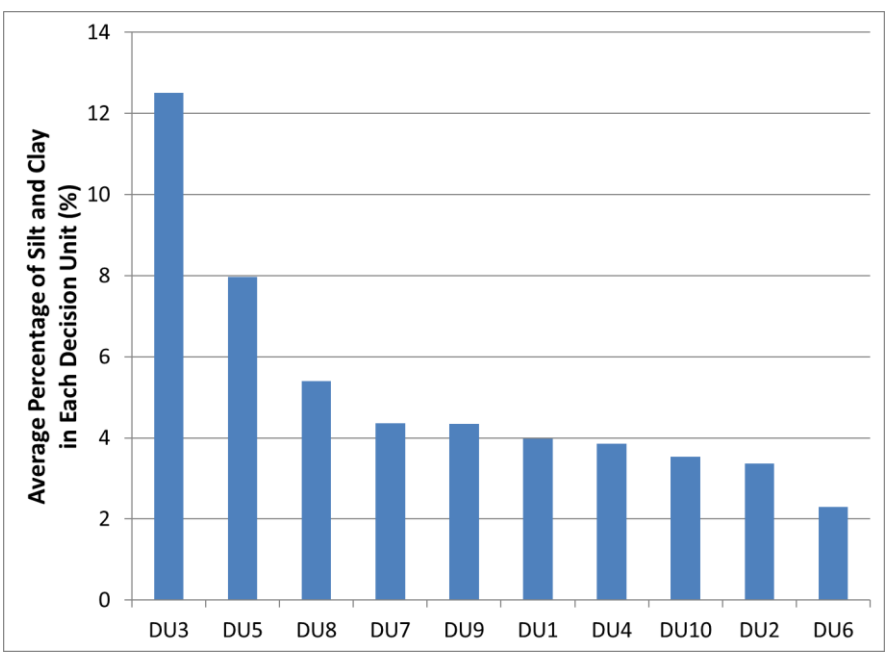

Figure 2.6 Average percentage of fine material (i.e., silt and clay) in each Decision Unit.

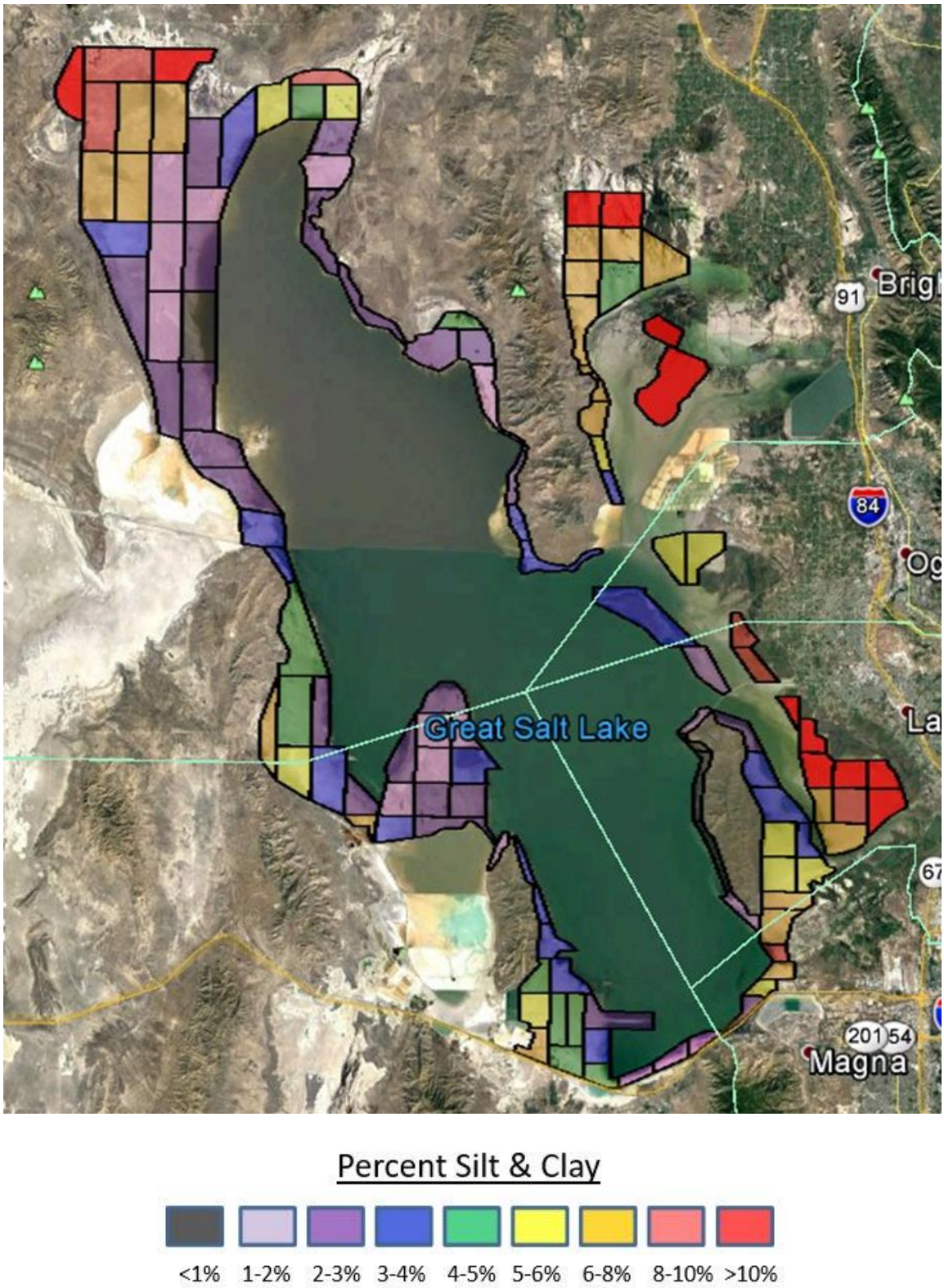

Figure 2.7 Map showing what fraction of the GSL lakebed soil is composed of silt and clay. Actual values for each SU are included in Appendix B. This same color scale is used for the maps contained in Appendix A.

2.3 Surface Crust Types

While the fraction of fine material in the parent soil is important when assessing the potential of an area to act as a dust source, the presence of surface crusts and/or vegetation can dramatically reduce the amount of dust generation. Certain types of surface crusts and vegetative cover can even eliminate dust production altogether. It is for this reason that the surface conditions were recorded for each of the 5246 ISM soil sample locations. The surface conditions were categorized with respect to vegetation, surface crust, and special features (Table 2.3). Examples of thick crust, erodible moderate crust, shallow crust, and no crust are shown in Figures 2.8-2.11. The surface condition data for all soil sample locations are included in Appendix C.

Table 2.3 Summary of the Surface Condition Categories Used in this Study.

Parameter	Code	Description	Criteria
Vegetation	V	Vegetated	> 80% Coverage
	SV	Some Vegetation	5% - 80% Coverage
	NV	No Vegetation	0% Coverage
Crust	TC	Thick Crust	Thickness > 1 cm
	MC	Moderate Crust	0.5 cm < Thickness < 1 cm
	SC	Shallow Crust	Thickness < 0.5 cm
	NC	No Crust	No Crust
	ETC	Erodible Thick Crust	Thickness > 1 cm + Eroding Surface
	EMC	Erodible Moderate Crust	0.5 cm < Thickness < 1 cm + Eroding Surface
	ESC	Erodible Shallow Crust	Thickness < 0.5 cm + Eroding Surface
Features	VF	Visible Fine Particulate Matter	Dust Plume Visible Upon Disturbance
	COL	Cobbles	Rock Diameter > 64 mm
	COM	Pebbles	4 mm < Rock Diameter < 64 mm
	COS	Granules	Rock Diameter < 4 mm
	SA	Salt	Visible Salt Crystals
	B	Organic (Black) Soil	Dark Black Soil
	SND	Sand Dune	Elevated Sand Structure with No Crust
	BM	Biomat	Surface Crust Composed of Organic Material
	EBM	Erodible Biomat	Eroding Surface Crust Composed of Organic Material
	BH	Bioherm	Unlayered, Mound-Shaped Rock Structure
	HAL	Halite	Salt Crust with a Thickness > 1 cm
	GYP	Gypsum (Selenite)	Selenite Crystals on Surface
	HEX	Polygon Structures	Dried Mud Polygons
	CIR	Circular Structures	Round Features with Diameter > 2 m
	MR	Moving Rocks	Rocks that Moved and Left Trails in the Playa

Figure 2.8 Examples of thick crust (top and center) and erodible thick crust (bottom).

Figure 2.9 Examples of erodible moderate crust.

Figure 2.10 Examples of shallow crust. (Top) Granules on the shallow crust with blowing dust in the background. (Center) Cross-sectional view of the shallow crust. (Bottom) Erodible shallow crust.

Figure 2.11 Examples of no crust (top), no crust with a sand dune (center), and no crust due to disturbance by ATVs (bottom).

The surface crust survey revealed that 67.6% of the GSL lakebed is protected by a shallow crust (SC) (Fig. 2.12). Intact thick (TC) and moderate (MC) crusts protect an additional 5.7% of the lakebed. The remaining 26.6% either has no crust (NC) or an erodible crust of variable thickness (e.g., ETC, EMC, or ESC). The percentage of thick, moderate, shallow, and no surface crust conditions for each DU are summarized in Figures 2.13 – 2.16, respectively. The highest percentages of thick crust (32.9% and 21.3%, respectively) were found on the eastern side of the GSL in DU5 and DU3 (Fig. 2.13). However, DU5 had a much larger fraction of erodible thick crust than DU3. The smallest percentage of thick crust was observed in DU1 on the south shore of the GSL (Fig. 2.13). The highest percentages of moderate crust (22.3% and 11.3%, respectively) were observed in DU5 and DU9 (Fig. 2.14). More than 50% of the moderate crust was observed to be erodible in both of these DUs. The smallest percentages of moderate crust were observed in DU1 and DU6. All of the lakebed, with the exception of DU5, had at least 70% shallow crust coverage (Fig. 2.15). The highest fractions of erodible shallow crusts were observed in DU3 and DU5. The highest percentages of no crust (26.4% and 17.0%, respectively) were observed on the western side of the GSL in DU6 and DU7 (Fig. 2.16). The smallest percentages of no crust were observed in DU3, DU5, and DU9.

Although slightly more than one quarter of the lakebed currently has surface crust conditions conducive to dust production (Fig. 2.12), some of these locations are partially vegetated and some had so little fine material in the soil that no dust plume was generated when the surface was disturbed. Thus, the actual percent of the lakebed which will serve as dust source regions (i.e., "hot spots") will be less than this value.

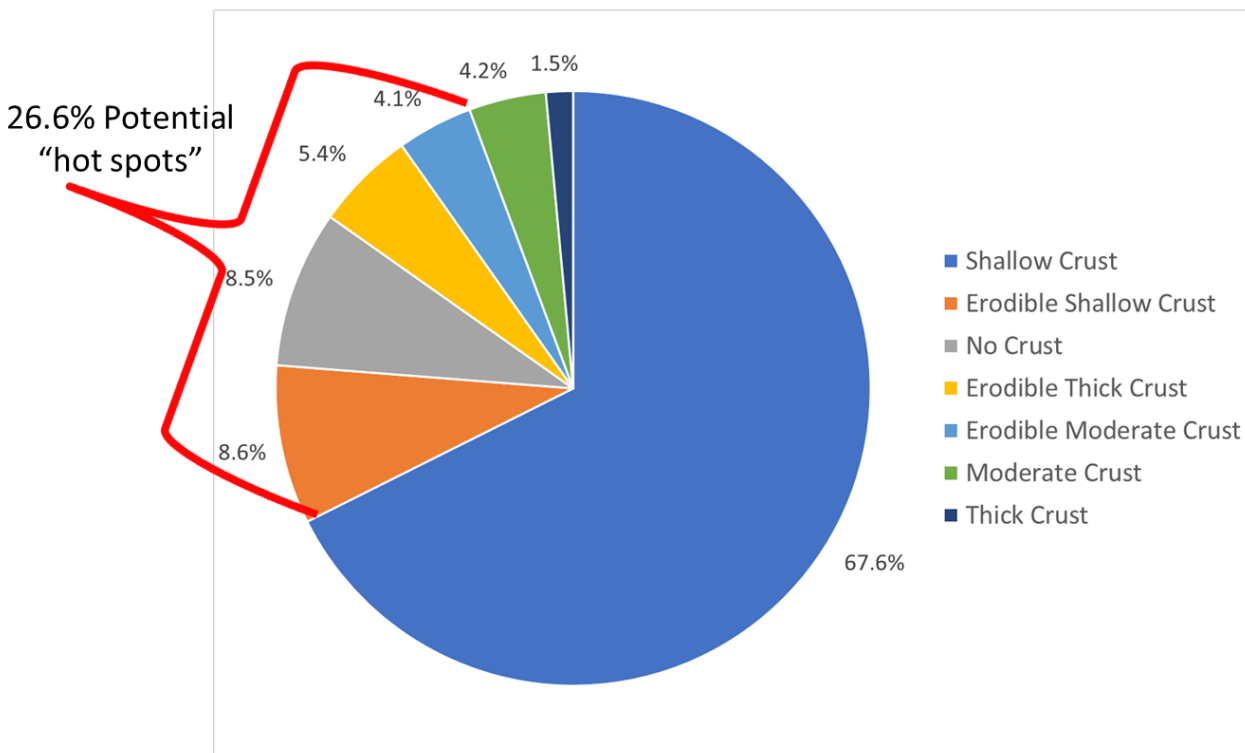

Figure 2.12 Summary of surface crust characteristics for the entire GSL lakebed.

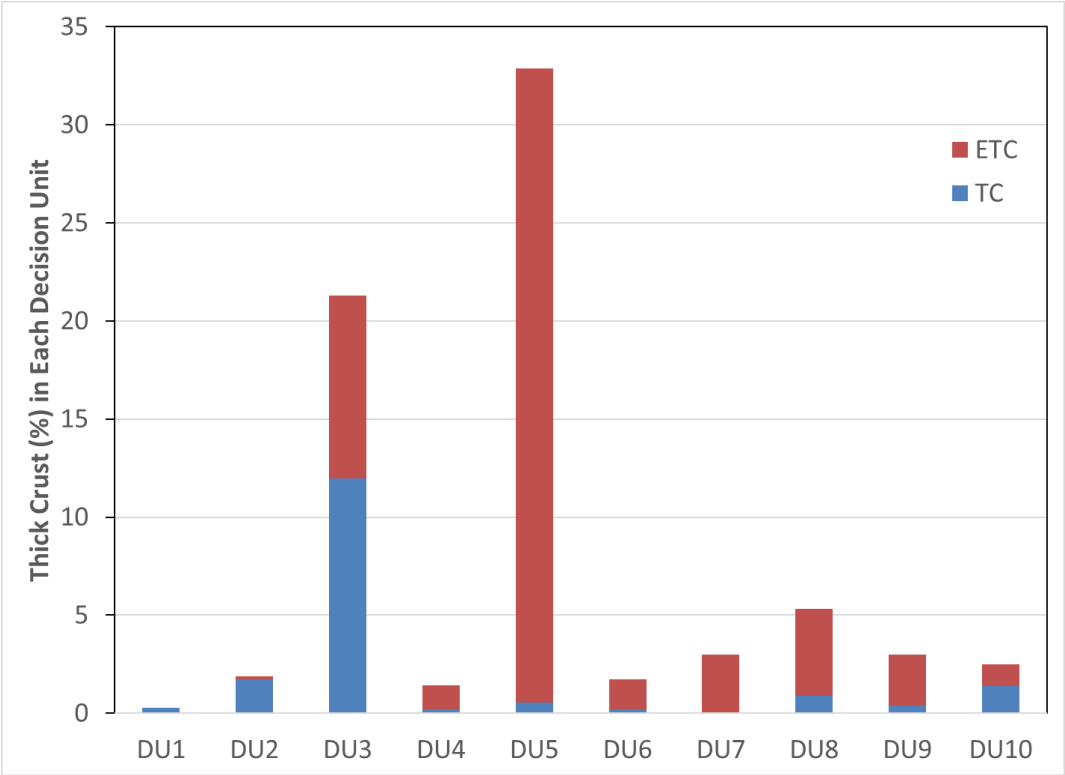

Figure 2.13 Thick crust (TC) and erodible thick crust (ETC) percentages for each DU.

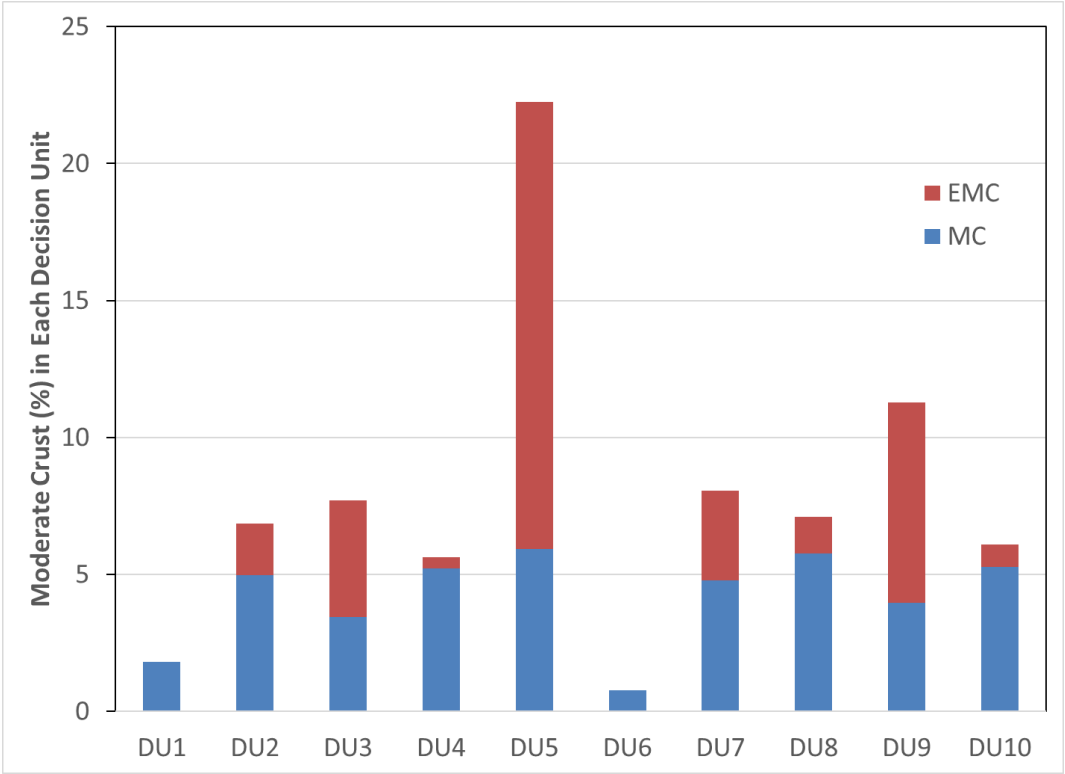

Figure 2.14 Moderate crust (MC) and erodible moderate crust (EMC) percentages for each DU.

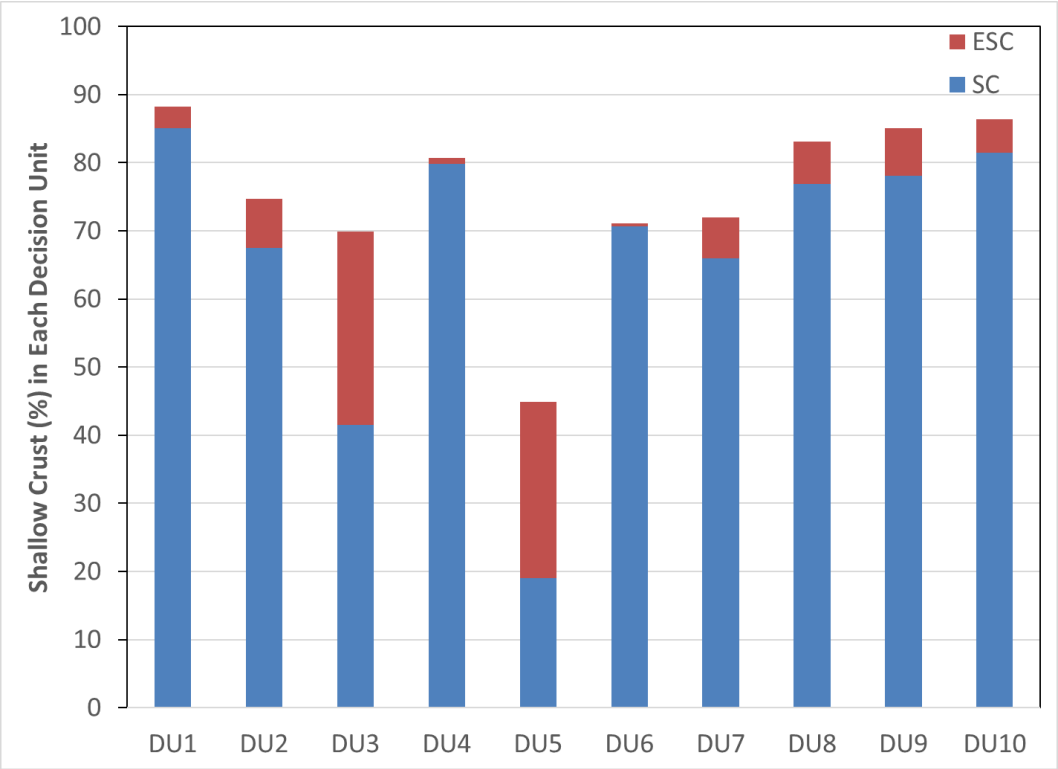

Figure 2.15 Shallow crust (SC) and erodible shallow crust (ESC) percentages for each DU.

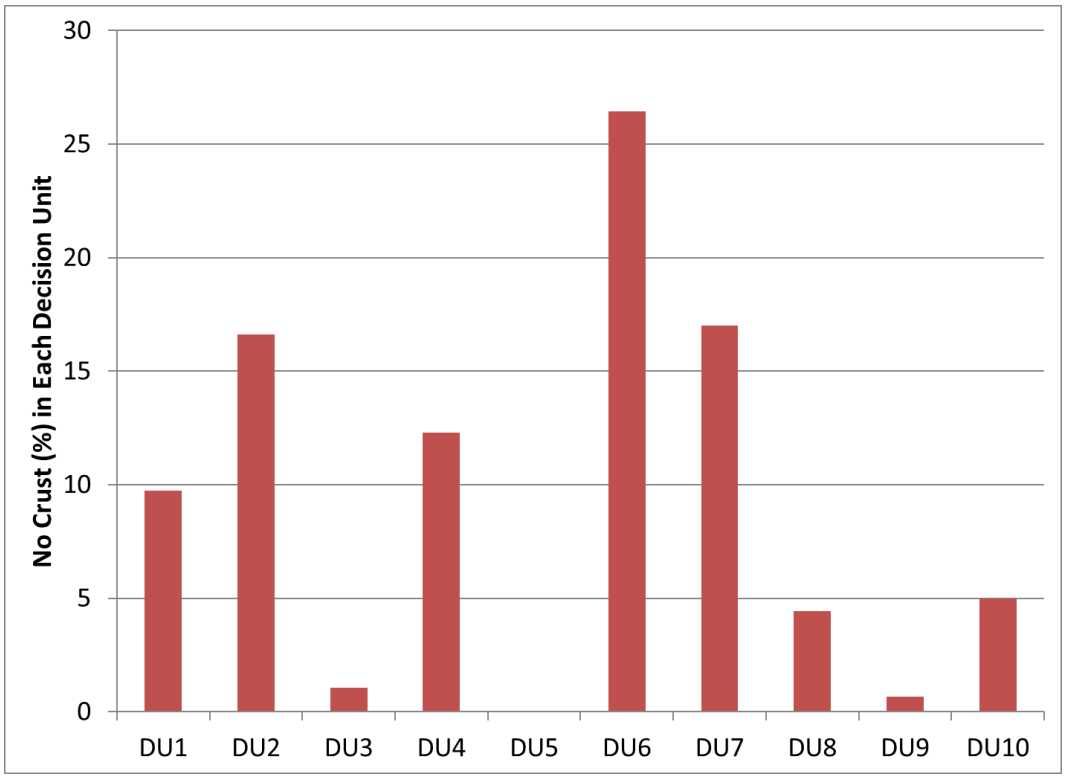

Figure 2.16 No crust (NC) percentages for each DU.

2.4 Testing for Dust Plumes by Manually Disturbing the Surface

One thing that all dust source regions on the lakebed have in common is that they will generate a visible dust plume if the surface is disturbed. A boot test, which involves kicking the surface several times, was completed at each of the 5246 ISM soil sample locations to determine which locations are susceptible to wind erosion. Locations which failed to produce visible dust plumes using this drastic testing method are unlikely to generate dust through wind erosion alone. Locations which did generate dust plumes using this methodology should be considered as potential dust source regions. The 1153 locations which passed the boot test and generated visible dust plumes are shown in Figure 2.17. Detailed maps for each DU are contained in Appendix D. These locations represent 21.9% of the entire lakebed. It should be noted, however, that some of these locations are partially vegetated or are covered by a non-eroding crust (i.e., TC, MC, or SC). Thus, the actual percent of the lakebed which will serve as dust source regions (i.e., "hot spots") will be less than this value.

2.5 Vegetation

The presence of vegetation on the lakebed suppresses dust production by stabilizing the soil and reducing the velocity of the wind near the surface through increased friction. All of the vegetation currently on the lakebed is relatively young (i.e., < 30 years old) because the peak lake level occurred in 1986. The surface crust survey revealed that 15.2% of the GSL lakebed supports some vegetation. However, the variation among the different DUs was quite large (Fig. 2.18). The maximum vegetative coverage was observed in DU3, DU5, and DU8 along the eastern side of the GSL where the fractions of fine particles (i.e., silt and clay) were highest. Figure 2.19 shows that there is a moderately strong correlation between the amount of vegetative cover and the fraction of fine particles in the soil. The salt content of the soil and the length of time that an area has been exposed are likely additional controlling factors of the vegetation spatial variations. A map summarizing the vegetative coverage of the GSL lakebed is shown in Figure 2.20. Detailed maps of the vegetative coverage in each DU are provided in Appendix E.

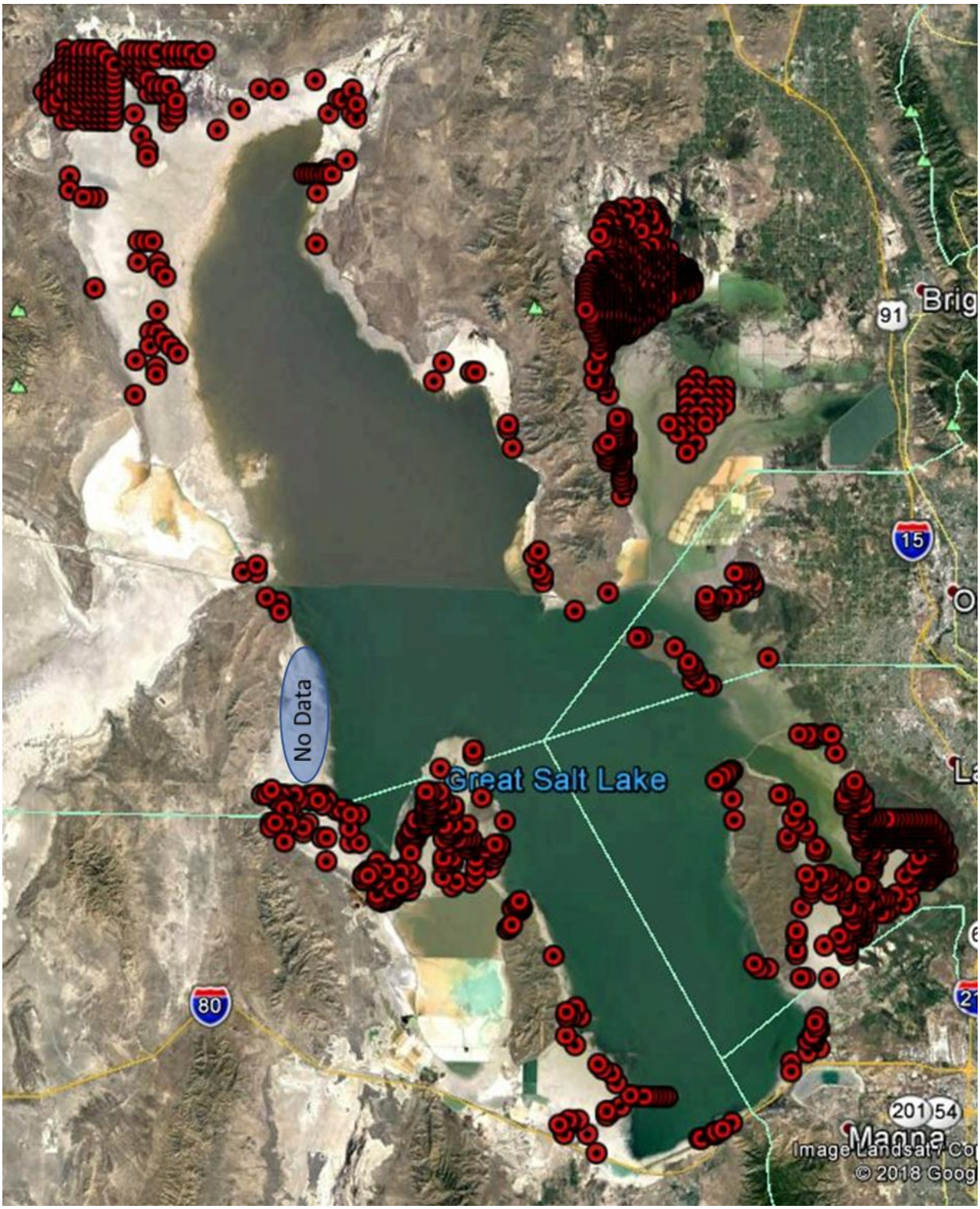

Figure 2.17 Map showing the locations which passed the boot test and generated visible dust plumes when disturbed. Detailed maps of each DU are contained in Appendix D.

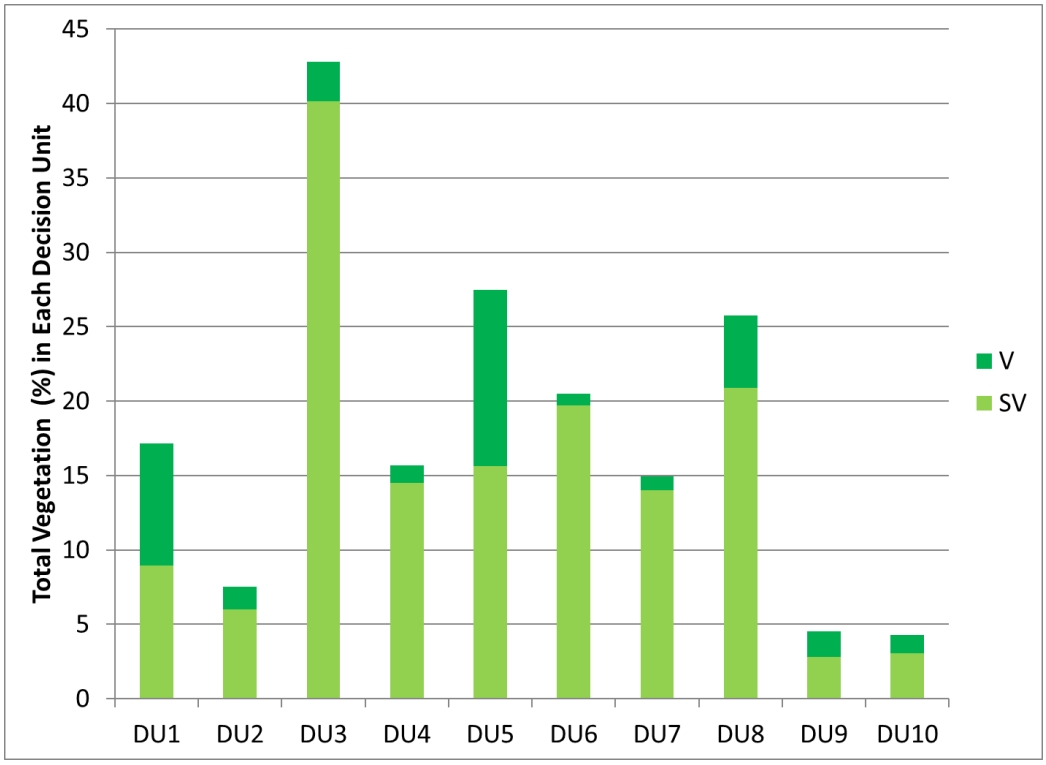

Figure 2.18 Average total (V) and partial (SV) vegetative cover for each DU.

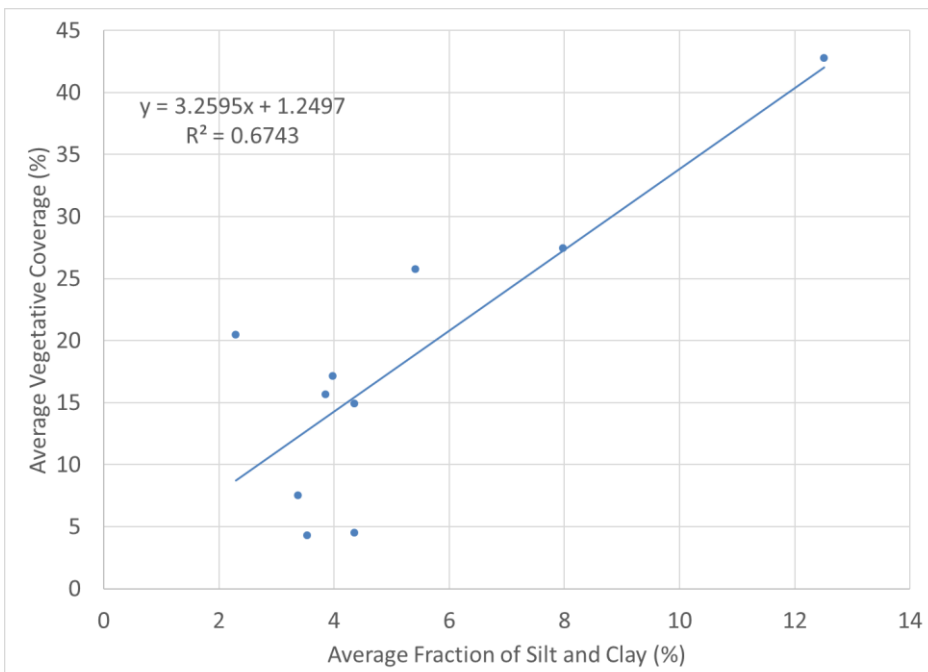

Figure 2.19 Relationship between the vegetative cover and the fraction of fine particles (i.e., silt and clay) in the soil.

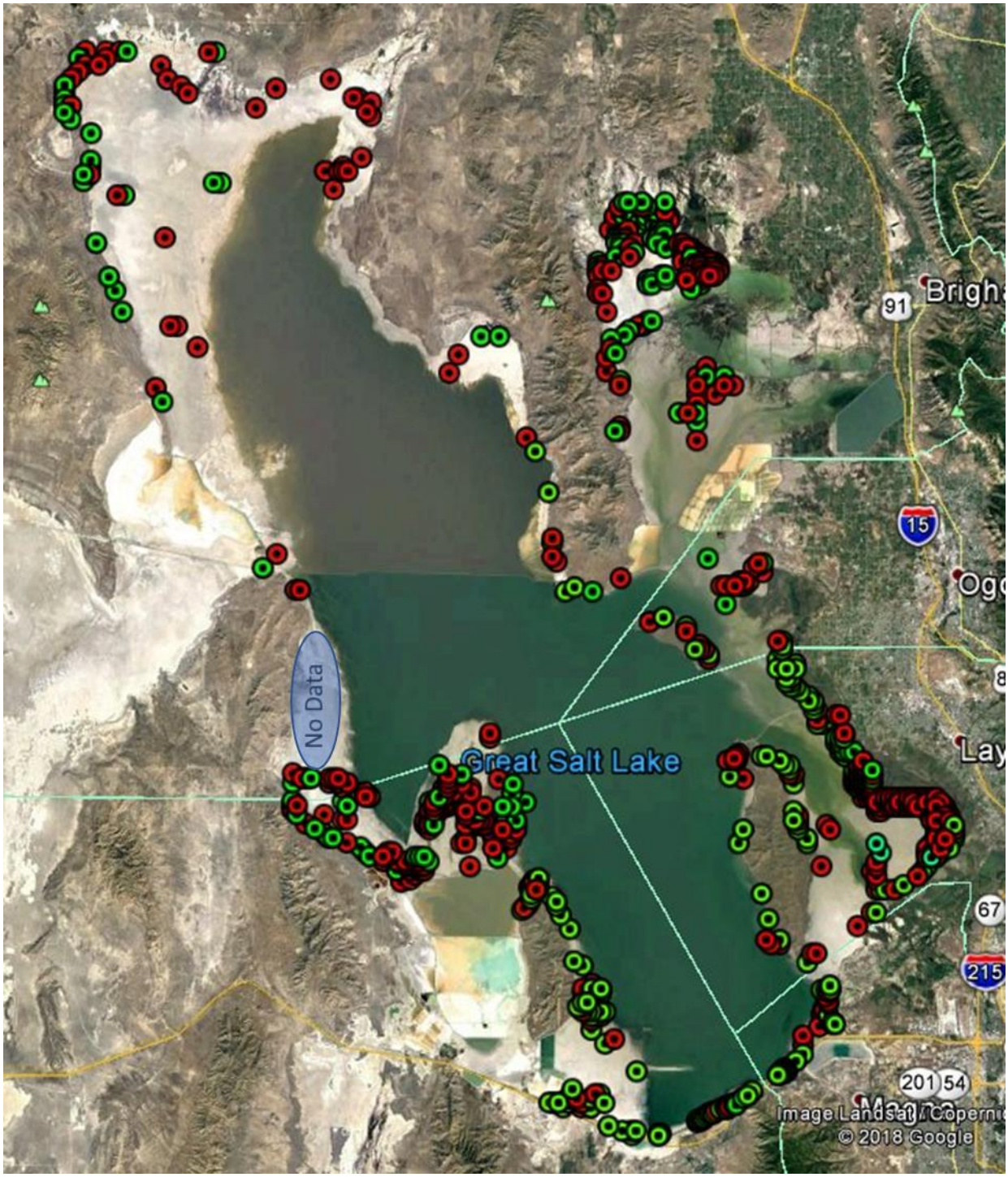

Figure 2.20 Map showing the locations where vegetation was observed on the GSL lakebed. Red markers indicate that the vegetation occurred in an area where the boot test generated dust plumes from the surface. Detailed maps showing the locations of vegetation in each DU are provided in Appendix E.

2.6 Dust "Hot Spots"

The most likely regions of the GSL lakebed to act as dust sources are those that have visible fines (VF) (i.e., pass the boot dust plume test), have no vegetation (NV), and have either no crust (NC) or an erodible shallow crust (ESC). This concept is shown in a Venn diagram (Fig. 2.21). There were 4450 NV observations, 1153 VF observations, and 903 NC/ESC observations. The union of these data sets yielded 446 locations which are now identified as dust "hot spots". These "hot spots" represent 8.5% of the GSL lakebed. The locations of these "hot spots" are shown in Figure 2.22 with detailed "hot spot" maps for each DU included in Appendix F.

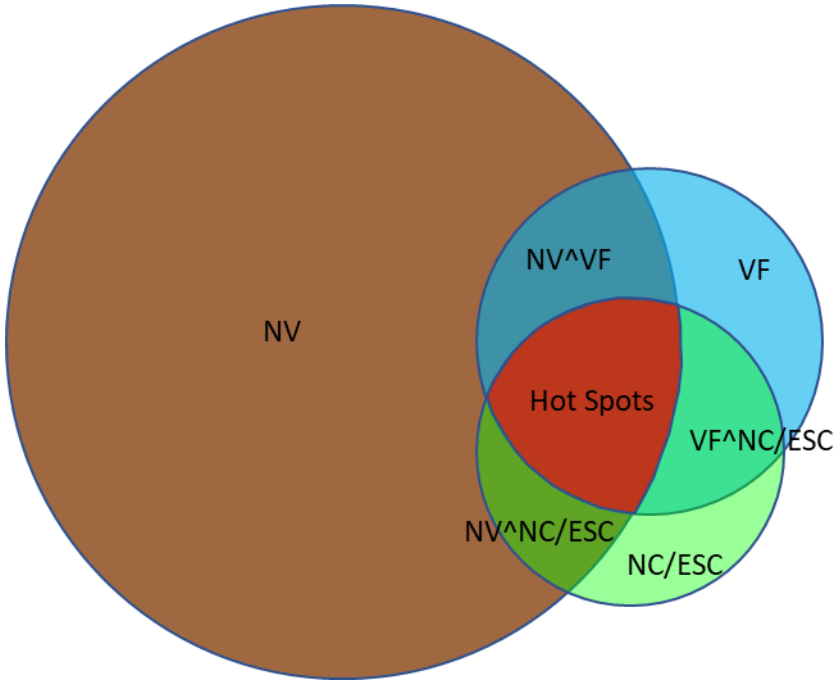

Figure 2.21 Venn diagram identifying dust "hot spots" as the union of NV, VF, and NC/ESC.

2.7 Key Findings/Uncertainties

Key Findings

- Dust "hot spots" were identified in all four quadrants of the GSL (i.e., Farmington Bay, Bay River Bay, northwestern Gunnison Bay, and the southern portion of Carrington Bay).
- Dust "hot spots" are rare in most of Gunnison Bay (NW Quadrant) and Gilbert Bay (SW Quadrant).
- Approximately 9% of the GSL lakebed currently produces dust plumes under appropriate meteorological conditions.
- 22% of the lakebed generates dust plumes when manually disturbed and could act as dust sources if the protective vegetative cover is reduced or if existing surface crusts are physically destroyed or eroded.

- Approximately 15% of the lakebed is currently covered by some vegetation.

- Approximately 73% of the lakebed is protected by shallow, moderate, or thick surface crusts. The remaining 27% of the lakebed either has no crust or an eroding crust of various thicknesses.

- On average, the GSL lakebed is composed of 95% sand and 5% silt and clay. Since it is the silt and clay fractions which are prone to wind erosion, the GSL is less effective at producing dust plumes than many other regional dust sources.

- Access to the two dust source regions on the eastern side of the GSL (i.e., Farmington and Bear River Bays) is severely limited by a combination of private property, vegetative barriers (e.g., phragmites) and fencing. As a result, the fragile surface crusts in these areas are fairly-well protected from disturbance.

- Access to the two dust source regions on the western side of the GSL (i.e., NW Gunnison and Carrington Bays) is not physically restricted by vegetative barriers or fencing. As a result, the fragile surface crusts in these regions are vulnerable to disturbance.

- A total of 757 mi^2 of exposed lakebed was sampled during this study.

Uncertainties

- The field work was conducted over a period of 26 months and does not represent a snapshot of the surface crust conditions. As a result, seasonal and shorter time-scale weather variations may have resulted in an underestimate of the number of dust "hot spots" and the fraction of the lakebed capable of generating dust plumes if manually disturbed.

- The GSL elevation varied by more than 3 feet in the southern arm and 5 feet in the northern arm during this study. As a result, some areas which were sampled in late 2016 are now under water and some areas which were exposed in late 2016 were covered by water before they could be sampled.

- The number of dust "hot spots" does not necessarily correlate with the amount of dust produced in a given area due to a variety of other contributing factors (e.g., soil particle size distribution, soil moisture, surface crust type, etc.). Further research is required to determine which of the four primary GSL dust source regions generates the highest concentrations of airborne particulate matter.

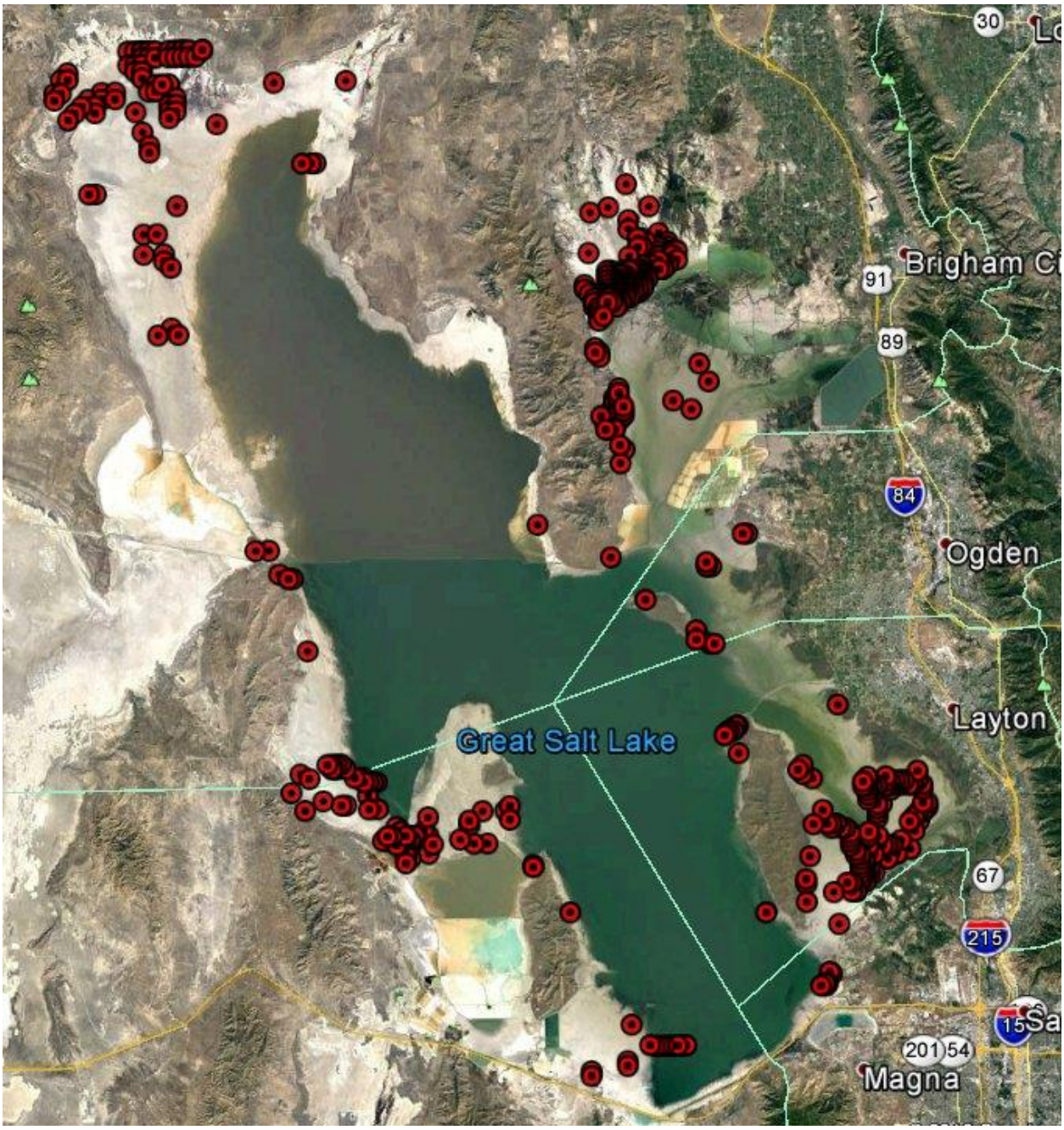

Figure 2.22 Map showing the locations of the Great Salt Lake dust "hot spots" (i.e., no vegetation, no crust or an erodible shallow crust). Detailed "hot spot" maps for each DU are provided in Appendix F.

3. How Common are Strong Wind Events?

3.1 Available Data

To investigate the strong wind events capable of generating local dust plumes, data from several weather stations and Utah Division of Air Quality (UDAQ) monitoring sites were analyzed over a 10-year period (i.e., 2006-2015). The four main sites include the Salt Lake City International Airport (KSLC, from the Automated Surface Observing System, ASOS) and the UDAQ monitoring stations at Hawthorne Elementary (Salt Lake City, HW), Bountiful (BV), and Lindon (LN)). These data are all available at 1-min resolution. Auxiliary datasets in the vicinity of the new Utah State Correctional Facility include two stations operated near the Kennecott Utah Copper tailings ponds, named Dike (KCC05) and Center Tailings (KCC13), and an additional UDAQ monitoring station, Saltair (QSA). For these additional sites, hourly data was retrieved from mesowest (http://mesowest.utah.edu/, *Horel et al.* 2002). See Table 3.1 for station details and Fig. 3.1 for a map of the wind observation locations.

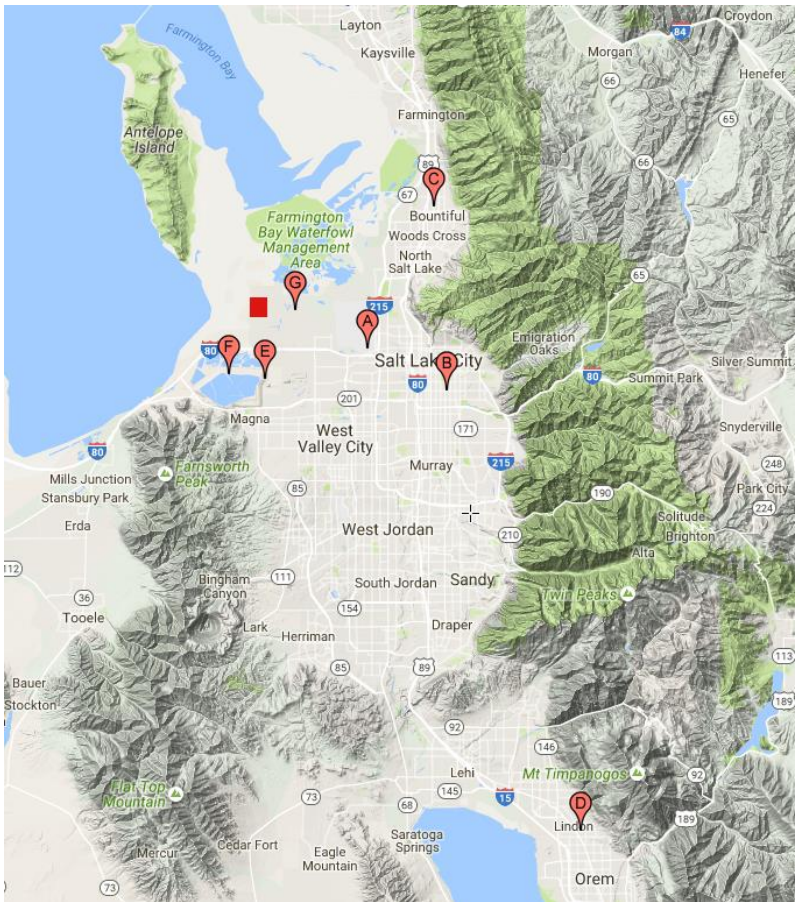

Figure 3.1. Map showing locations of wind observations. A: Salt Lake City International Airport (KSLC), B: Hawthorne Elementary (HW), C: Bountiful (BV), D: Lindon (LN), E: Kennecott Dike (KCC05), F: Kennecott Center Tailings (KCC13), G: Saltair (QSA). The location of the new Utah State Correction Facility is shown as a red square. [Source: mapper.acme.com.]

Table 3.1 Meteorological Measurement Locations, Time Intervals, and Data Coverage.

Site	Latitude Longitude Elevation	Data interval	Data Coverage	Measurement Height (above ground level)
Salt Lake City International Airport (KSLC)	40.7707°N -111.9650°E 1288 m	1 min	90.77% (67.21%)*	10 m
Hawthorne Elementary (HW)	40.7335°N -111.8717°E 1312 m	1 min	86.45% (67.21%)*	10 m
Bountiful (BV)	40.8980°N -111.8855°E 1316 m	1 min	99.42% (67.21%)*	10 m
Lindon (LN)	40.3388°N -111.7133°E 1442 m	1 min	88.55% (67.21%)*	10 m
Kennecott Dike (KCC05)	40.7439°N -112.0858°E 1338 m	1 hour	47.85%	***unknown***
Kennecott Center Tailings (KCC13)	40.7488°N -112.1281°E 1353 m	1 hour	47.80%	***unknown***
Saltair (QSA)	40.8060°N -112.0498°E 1282 m	1 hour	34.28%	10 m

* The number in parenthesis represents the data coverage in which all weather stations had simultaneous 1-minute data (i.e. the homogenized data set)

3.2 Previous Research

Although particles smaller than ~75 micrometers in diameter are susceptible to lofting by winds (*Nickling*, 1988), considerable uncertainty exists regarding the 'threshold' wind speed needed for various surface and soil types for the onset of saltation and resulting wind erosion and dust emission. The Western Regional Air Partnership made an assumption of a 20 mph (9 m s^{-1}) threshold wind velocity for dust lofting (*Countess Environmental*, 2006). *Pelletier* (2006) modeled dust transport under a range of soil moistures for the soda (dry) lake playa in California, and found that the threshold wind velocity for onset of saltation ranged between 8 and 14 m s^{-1}. *Steenburgh et al.* (2012) found that the mean sustained hourly mean wind speed

during dust reports at the Salt Lake City airport was 11.6 m s^{-1}. Because of the uncertainty in the threshold wind velocity for the GSL, we perform the following meteorological analyses for both the best estimate (11 m s^{-1}) and more conservative (9 m s^{-1}) threshold wind velocities.

Two previous studies have looked at the climatology of dust episodes in the Salt Lake City area (*Steenburgh et al*., 2012 and *Hahnenberger and Nicoll*, 2012). The focus of these studies was the long-distance transport of dust from Nevada and southern Utah into the Great Salt Lake basin. Because of this, we would expect their findings on dust storm frequency to impact all portions of the Wasatch Front relatively similarly. These studies did not take into account the recent and historic periods when the Great Salt Lake playa surfaces were exposed as potential dust sources due to water diversions and drought. The key findings of the *Steenburgh et al.* (2012) and *Hahnenberger and Nicoll* (2012) studies are:

- The frequency distribution of wind directions during dust events is bimodal (southerly or northerly).
- Southerly wind episodes are more likely to be associated with dust than northerly wind episodes (note, however, the climatology was conducted mostly during higher GSL level years when no dust source would have been available on the GSL playa).
- Widespread (i.e., regional) dust episodes over northern Utah occur 4-5 times per year on average, and are most common in the spring.
- High winds and dust reports are most common between noon and 6 pm local time.
- Most dust reports happen within 2 hours of a cold frontal passage.
- Most dust episodes (66%) are associated with synoptic weather patterns (e.g., trough or ahead of or during a cold frontal passage), while a lesser portion of episodes are associated with thunderstorms and convection (33%).

3.3 Climatology of Strong Wind Events Along the Wasatch Front

3.3.1 Wind Rose Analysis

A windrose analysis was performed for both general conditions (excluding calm winds < 1 m s^{-1}) and for high wind conditions with wind speeds > 11 m s^{-1}. Windroses for general conditions at all sites are shown in Figure 3.2 (main sites) and Figure 3.3 (auxiliary sites). For the analysis of the main sites (KSLC, HW, BV), the data was homogenized. This means that only data is included from times when all four locations were reporting. This avoids potential biases due to equipment outages. Data coverage for the homogenized dataset is 67.21%. The analysis of the three auxiliary sites (KCC05, KCC13, QSA) includes all available data.

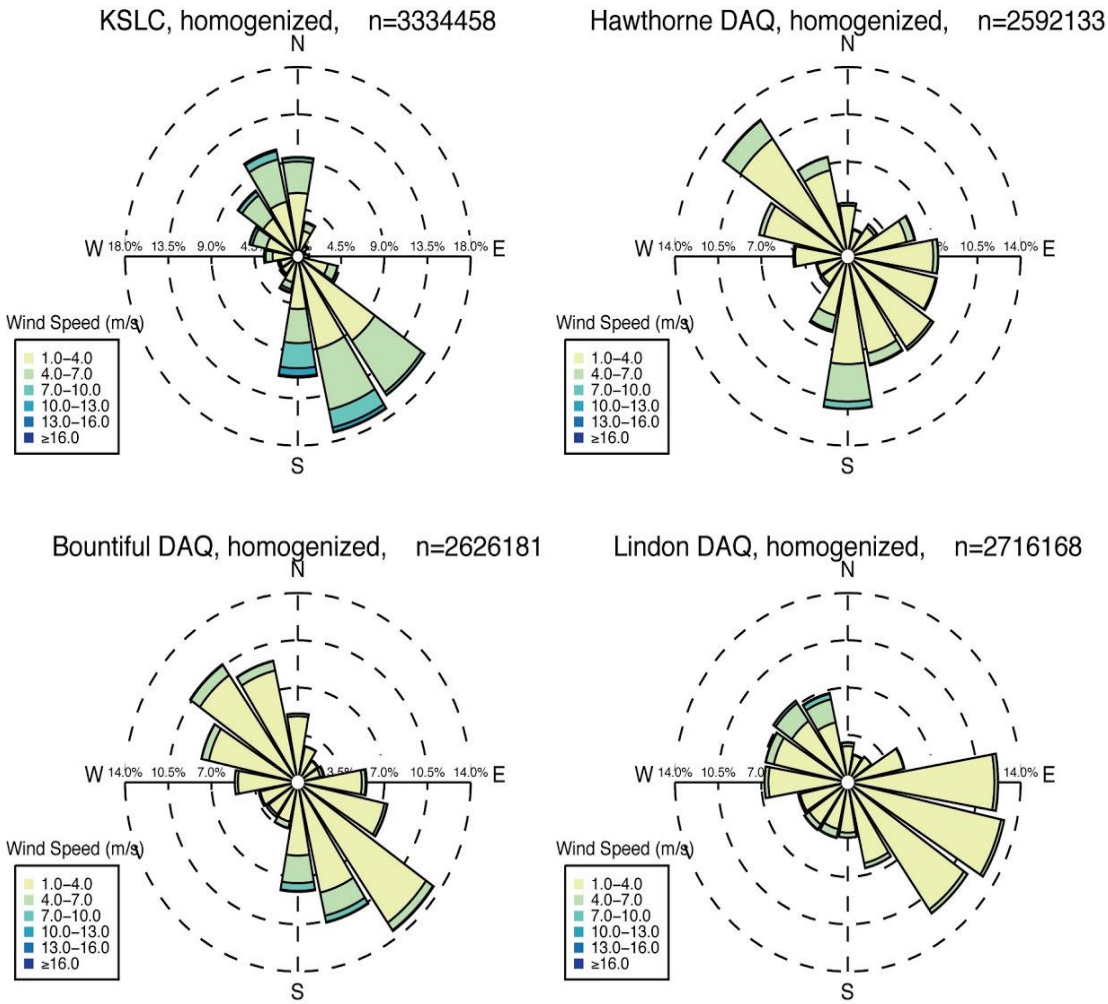

Figure 3.2 Windrose plots for KSLC, HW, BV and LN. Only data is included when all stations were reporting. Winds below 1 m s^{-1} are excluded from wind statistics. Value n gives the number of 1-minute data points where winds exceed 1 m s^{-1}.

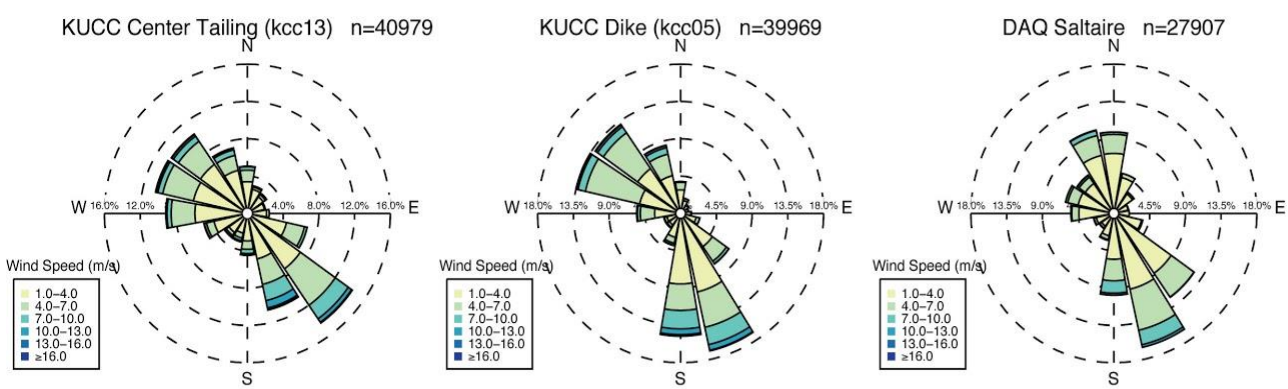

Figure 3.3 Windrose plots for KCC13, KCC05 and QSA. All available data is included. Value n gives the number of hourly data points where winds exceed 1 m s^{-1}.

The wind field at the study locations reflects the orientation of the key geographic features of the Salt Lake City basin. The main wind directions at the Salt Lake City International Airport (KSLC) are S-SE and NNW-N (Fig. 3.2). Wind speeds are generally higher at KSLC than at the other three main sites. The main wind directions at Hawthorne (HW) and Bountiful (BV) are WNW-NNW and E-S (Fig. 3.2) with the strongest wind speeds from the SSE-SSW and NW-NNW directions. The wind field in Lindon (LN) is dominated by generally weak E to ESE flow or flows from the northwesterly quadrant.

Windrose plots for high wind conditions (i.e., ≥ 11 m s^{-1}) are shown in Figures 3.4 and 3.5 for the four main sites and the three auxiliary locations. High wind conditions are defined here as times when the wind speed exceeds a threshold value of 11 m s^{-1}. Under these conditions, the lofting of particulate matter is likely to occur, and particulates are suspended into the flow field (*Steenburgh et al*., 2012; *Pelletier*, 2006). The strong winds are generally associated with either southerly or northwesterly flows. In addition, the weak signature of strong easterly downslope winds ("Wasatch Winds") can be seen in the windroses for Bountiful and to some extent, Hawthorne.

3.3.2 Strong Wind Conditions

High wind conditions are more likely to occur at KSLC than in the urbanized areas around HW, BV and LN. The 10-year record at KSLC contains 443 days when winds were > 11 m s^{-1} for more than 15 minutes, corresponding to 13% of all days when data was reported. In contrast, only 12 (27, 41) days meet these criteria at HW (LN, BV) (Table 3.2). When lowering the wind speed threshold to 9 m s^{-1}, a conservative reference value used for threshold velocities in some other studies, the frequency of days experiencing such winds for at least 15 minutes, rises to 26% at KSLC and 3-4% at HW, LN and BV. This clearly illustrates that high winds are much more likely to occur near the new Utah State Correction Facility site than at the current UDAQ monitoring stations.

The auxiliary sites on the Kennecott Utah Copper tailings operations report only hourly and have a reduced period of record (Table 3.2). The high frequency of above-threshold winds (Table 3.2) is most likely due to the exposure of the sites to the flow field on the elevated terrain of the high tailing piles (65 m and 50 m above the height of KSLC). Under high wind conditions, the flow is most frequently from a southerly direction. Southerly wind directions constitute 78% of the high-wind observations at KSLC, 71 % at HW, 91% at LN, and 81% at BV (Table 3.2).

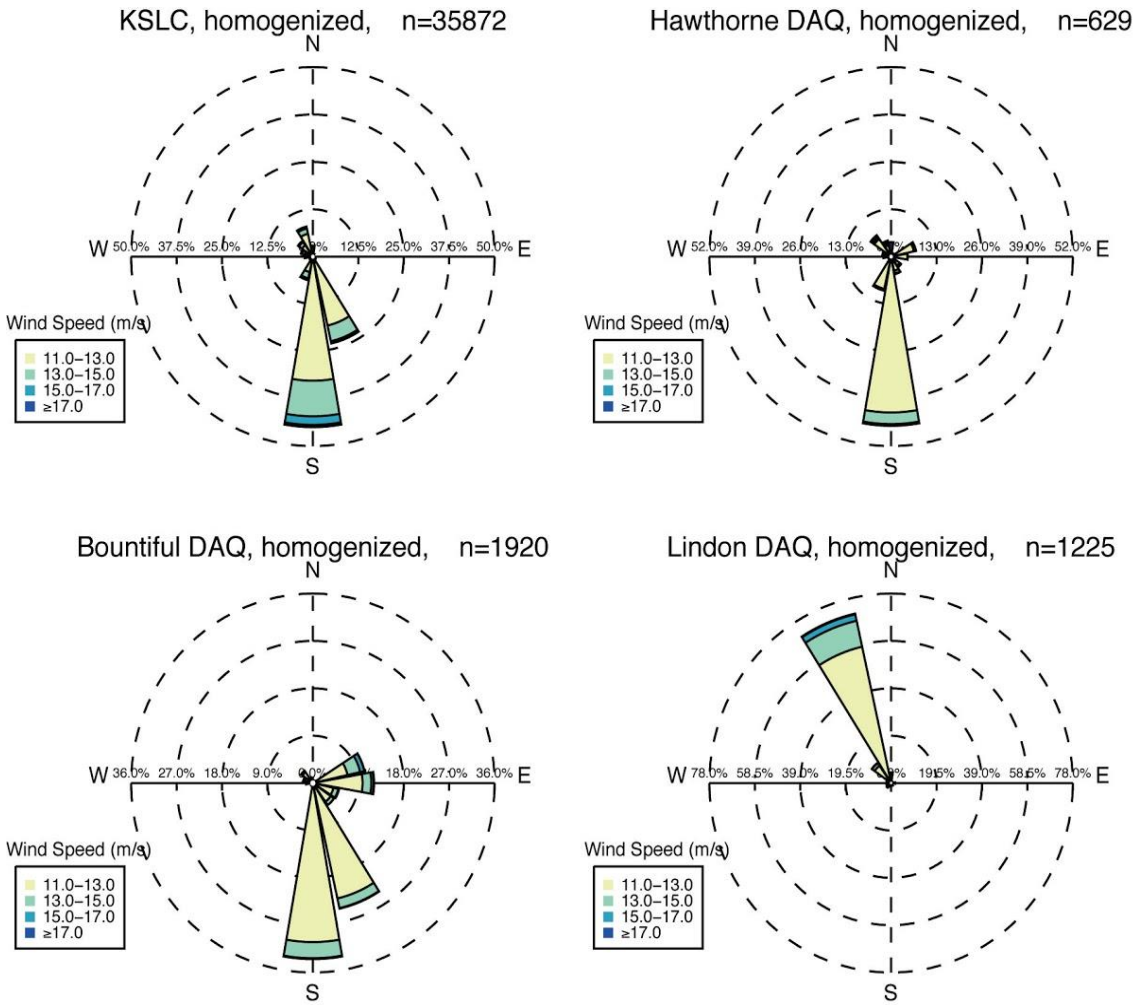

Figure 3.4 Windrose plots of high wind conditions for KSLC, HW, BV and LN. Data is included only when all stations were reporting. Winds < 11 m s^{-1} are excluded from the wind statistics. The n value gives the number of 1-minute data points when winds exceed 11 m s^{-1}.

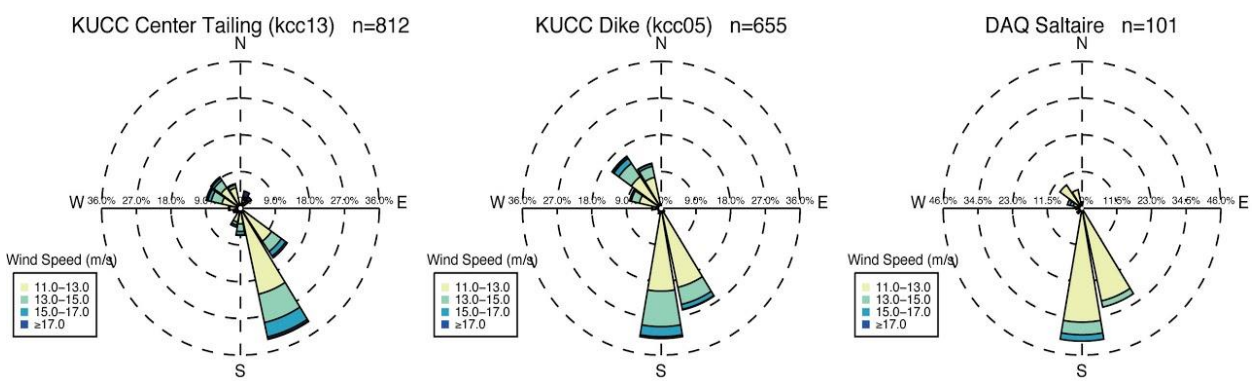

Figure 3.5 Windrose plots of high wind conditions for KCC13, KCC05 and QSA. All available data is included. The n value gives the number of hourly data points when winds exceed 11 m s^{-1}.

Table 3.2 **Summary of high-wind conditions at the selected study locations, illustrating the higher frequency of strong (≥ 11m s^{-1}; ≥ 9 m s^{-1}) winds near the new Utah State Correction Facility site, and the dominating southerly winds direction during high-wind events.**

Site	High wind ≥ 11m s^{-1} occurrence based on all available data	# days in record with ≥ 11m s^{-1} wind readings for more than 15 min	% of ≥ 11 m s^{-1} winds with a **southerly** wind component	% of ≥ 11m s^{-1} winds with a **northerly** wind component
Salt Lake City International Airport (KSLC)	1.01% *(3.25%)**	443 of 3461 (13%) *(917; 26%)**	78%	22%
Hawthorne Elementary (HW)	0.02% *(0.13%)**	12 of 3172 (0.4%) *(87; 2.7%)**	71%	29%
Bountiful (BV)	0.05% *(0.24%)**	41 of 3639 (1.1%) *(147; 4%)**	81%	19%
Lindon (LN)	0.03% *(0.14%)**	27 of 3245 (0.8%) *(125; 3.9%)**	91%	9%
KUC Center Tailings (KCC13)	1.94% *(4.71%)**	n.a.	63%	37%
KUC Dike (KCC05)	1.56% *(4.43%)**	n.a.	62%	38%
Saltair (QSA)	0.34% *(1.61%)**	n.a.	76%	24%

* Statistics for *≥ 9 m s^{-1}* in parentheses.

3.3.3 Meteorological Drivers of Observed Wind Regimes

Several weather patterns are associated with high wind events and are directly related to the wind direction of the strong winds. These weather patterns are:

- prefrontal southerly flow,
- postfrontal northwesterly flow,
- easterly downslope windstorms ("Wasatch Winds"), and
- outflows from thunderstorms.

Southerly wind directions are the most common, as shown in the wind climatology (Figs. 3.4 & 3.5 and Table 3.2). These strong southerly winds are driven primarily by approaching weather systems, and they typically persist for several hours but can blow for several days. Strong northwesterly winds are observed most frequently along and behind a cold front and typically persist for 1-4 hours. The Wasatch winds are strong easterly downslope windstorms that are confined to west-facing slopes and foothills. Signatures of these events are only seen at Bountiful, and to a lesser extent, at Hawthorne. Thunderstorm outflows occur during convective weather patterns and can cause strong winds from either a southerly or northwesterly direction during the April-October period.

3.4 Key Findings/Uncertainties

Key findings of the general wind climatology

- The Wasatch and Oquirrh mountains and the Great Salt Lake and other geographic features impact the wind speed and wind direction across the region.

- South-southeast and north-northwest wind directions are the most commonly observed wind directions at all locations.

- Wind speeds are higher at the sites located at and west of the Salt Lake City International Airport (KSLC, KCC05, KCC13, QSA) than at the urban sites on the eastern slope of the Wasatch Mountains (HW, BV, LN).

- The highest wind speeds (≥ 15 m s^{-1}) near the new Utah State Correction Facility site (KSLC, KCC13, KCC05, and QSA) occur most frequently during south-southeasterly wind episodes.

Key findings - high wind conditions

- High winds (≥ 11 m s^{-1}) occur at 1.1% of the time at KSLC.

- High winds (≥ 11 m s^{-1}, for more than 15 min) occurred on roughly 44 days every year at KSLC, but only about once every year at Hawthorne (HW)

- High wind conditions are more likely to occur near the new Utah State Correctional Facility site than at other locations in the basin. This is confirmed by the data from the Kennecott tailing sites.

- Near the new Utah State Correctional Facility site, high winds are predominantly southerly (62 to 78% of the time). They are otherwise from northwesterly directions.

Uncertainties

- Drastic declines in the GSL lake level result in a climatology for this study that is biased for a larger GSL surface area. The impact of the lower lake level on the wind speed and direction climatology and dust exposure, is unknown.

- We did not attempt to separate "dry" soil periods (when dust could be blown by the wind) from "wet" soil periods when winds would not loft dust, as there is insufficient soil moisture data to make such estimates.

- This study used several different instrument systems for wind measurements collected by the UDAQ, National Weather Service, and Kennecott Utah Copper. While the data passes gross quality control checks and appears of high quality, some uncertainty on the exact measurement height of the anemometers and the calibration of the instruments remains.

- Determining the actual threshold wind velocity necessary to generate dust plumes from the GSL is a complex function of the soil particle size distribution, surface crust characteristics, and soil moisture and was beyond the scope of this project. Thus, future research will need to be undertaken to determine the threshold wind velocities for the known GSL dust "hot spots".

4. Do Dust Plumes from the GSL Contain Harmful Heavy Metals?

4.1 Methodology

As described in Section 2.1, the soil samples from each SU were composited into a total of 122 samples. These soil samples were then dried in an oven at 105°C for a period of 24 hours, disaggregated, and sieved. The smallest sieve (#200) size yielded particles with diameters < 74 μm comprising silt and clay. These fine particles were then placed into a resuspension chamber where they were aerosolized using compressed air. The airborne soil particles were pulled through a URG Corporation PM_{10} inlet at a flow rate of 16.7 lpm to separate out the respirable, PM_{10}, particles. The PM_{10} particles were subsequently collected using two different methodologies. The first methodology was optimized for chemical analysis by Inductively-Coupled Plasma Mass Spectrometry (ICPMS) while the second methodology was optimized for chemical analysis by Synchrotron X-Ray Fluorescence (SXRF).

ICPMS requires a sample mass of > 10 mg to provide measurements which are reliably above the minimum detection limits. To collect the requisite PM_{10} mass, 30 to 90 g of the silt and clay particles (#200 sieve) were placed in a weigh boat and aerosolized inside a 0.5 m^3 resuspension chamber using compressed air. The PM_{10} particles which passed through the URG inlet were then collected onto pre-weighed, 25 mm, Teflon filters for a period of 15 minutes. The loaded Teflon filters were then reweighed to ensure that they met the 10 mg minimum mass requirement. Prior to the ICPMS analysis, the samples were completely digested in hydrofluoric acid. The sample preparation and ICPMS analysis were performed in the Metals Lab at the University of Utah (Department of Geology & Geophysics). The ICPMS system utilized an Agilent 7500ce, quadrupole mass-spectrometer with an octopole reaction system to preferentially remove polyatomic interferences. Calibration of the system was performed using a variety of NIST-traceable standards (Table 4.1).

SXRF requires much less sample mass than ICPMS. As a result, we were able to use an 8-stage rotating DRUM impactor to measure the size-resolved elemental composition of the resuspended PM_{10} soil. We placed 0.3 g of the silt and clay particles (#200 sieve) into a weigh boat and aerosolized it inside the resuspension chamber using compressed air. The PM_{10} particles which passed through the URG inlet at a flow rate of 16.7 lpm were then sampled by an 8-stage rotating DRUM impactor for a period of 15 minutes. The DRUM sampler impacted the particles onto a series of greased Mylar substrates. The DRUM separated the particles into the following size ranges based on their aerodynamic diameters: 10 – 5 μm, 5 – 2.5 μm, 2.5 – 1.1 μm, 1.1 – 0.75 μm, 0.75 – 0.56 μm, 0.56 – 0.34 μm, 0.34 – 0.24 μm, and 0.24 – 0.09 μm. The Mylar substrates were coated with a 1% Apiezon Type-L grease dissolved in toluene. The purpose of the grease was to minimize incorrect particle sizing due to particle bounce. The DRUM substrates were shipped to the Advanced Light Source at Lawrence Berkeley National Lab where we analyzed them using SXRF. Deconvolution of the raw X-ray spectra was performed using the Quantitative X-ray Analysis System (QXAS) X-ray peak-fitting software package which was developed by the IAEA Laboratories in Seibersdorf, Austria. Quantitative analysis was performed by calibrating the response of the system to a comprehensive set of 40

single- and multi-element NIST-traceable standards (Table 4.1). The SXRF analysis is completely non-destructive and did not require any additional sample preparation.

The SXRF analysis produces elemental areal density measurements in units of ng cm^{-2} while the ICPMS analysis produces elemental mass fractions in units of mg/kg (i.e., parts per million). To merge the two data sets it was necessary to normalize the SXRF data using Fe (i.e., iron). Iron was used to normalize the SXRF data set because it is the most abundant soil element measured by both techniques. It is also the element for which SXRF has the greatest sensitivity. To verify that the normalization procedure worked as expected, data from the two analytical techniques were compared for overlapping elements. The results for the major soil elements not associated with evaporite minerals (i.e., Al, Mn, and Ti) and one of the most abundant contaminants (Cu) are shown in Figure 4.1. The entire PM_{10} elemental mass fraction dataset is included as Appendix G.

Table 4.1 Summary of Analytical Techniques Used for this Study.

Atomic # - Element	Technique(s)	Uncertainty (%)		Atomic # - Element	Technique(s)	Uncertainty (%)
3 – Li	ICPMS	± 25%		38 - Sr	**ICPMS**/SXRF	± 25%/± 25%
4 – Be	ICPMS	± 10%		39 - Y	ICPMS	± 25%
5 – B	ICPMS	± 25%		40 - Zr	SXRF	± 25%/± 25%
11 - Na	ICPMS	± 10%		42 - Mo	ICPMS	± 10%
12 - Mg	**ICPMS**/SXRF	± 10%/± 25%		47 - Ag	ICPMS	± 10%
13 - Al	**ICPMS**/SXRF	± 10%/± 20%		48 - Cd	ICPMS	± 10%
14 - Si	SXRF	± 15%		51 - Sb	ICPMS	± 10%
15 – P	SXRF	± 15%		55 - Cs	ICPMS	± 25%
16 – S	SXRF	± 15%		56 - Ba	ICPMS	± 10%
17 - Cl	SXRF	± 15%		57 - La	ICPMS	± 25%
19 – K	**ICPMS**/SXRF	± 10%/± 15%		58 - Ce	ICPMS	± 25%
20 - Ca	**ICPMS**/SXRF	± 10%/± 15%		59 - Pr	ICPMS	± 25%
21 - Sc	ICPMS	± 25%		60 - Nd	ICPMS	± 25%
22 - Ti	ICPMS/**SXRF**	± 25%/± 15%		62 - Sm	ICPMS	± 25%
23 – V	**ICPMS**/SXRF	± 10%/± 15%		63 - Eu	ICPMS	± 25%
24 - Cr	**ICPMS**/SXRF	± 10%/± 15%		64 - Gd	ICPMS	± 25%
25 - Mn	**ICPMS**/SXRF	± 10%/± 15%		65 - Tb	ICPMS	± 25%
26 - Fe	**ICPMS**/SXRF	± 10%/± 15%		66 - Dy	ICPMS	± 25%
27 - Co	**ICPMS**/SXRF	± 10%/± 15%		67 - Ho	ICPMS	± 25%
28 - Ni	**ICPMS**/SXRF	± 10%/± 15%		68 - Er	ICPMS	± 25%
29 - Cu	**ICPMS**/SXRF	± 10%/± 15%		70 - Yb	ICPMS	± 25%
30 - Zn	**ICPMS**/SXRF	± 10%/± 15%		71 - Lu	ICPMS	± 25%
31 - Ga	SXRF	± 15%		81 - Tl	ICPMS	± 10%
33 - As	**ICPMS**/SXRF	± 10%/± 15%		82 - Pb	**ICPMS**/SXRF	± 10%/± 15%
34 - Se	**ICPMS**/SXRF	± 10%/± 15%		90 - Th	ICPMS	± 25%
35 - Br	SXRF	± 15%		92 - U	ICPMS	± 10%
37 - Rb	**ICPMS**/SXRF	± 25%/± 25%				

[Note: Bold indicates which analytic technique was chosen when both ICPMS and SXRF were available]

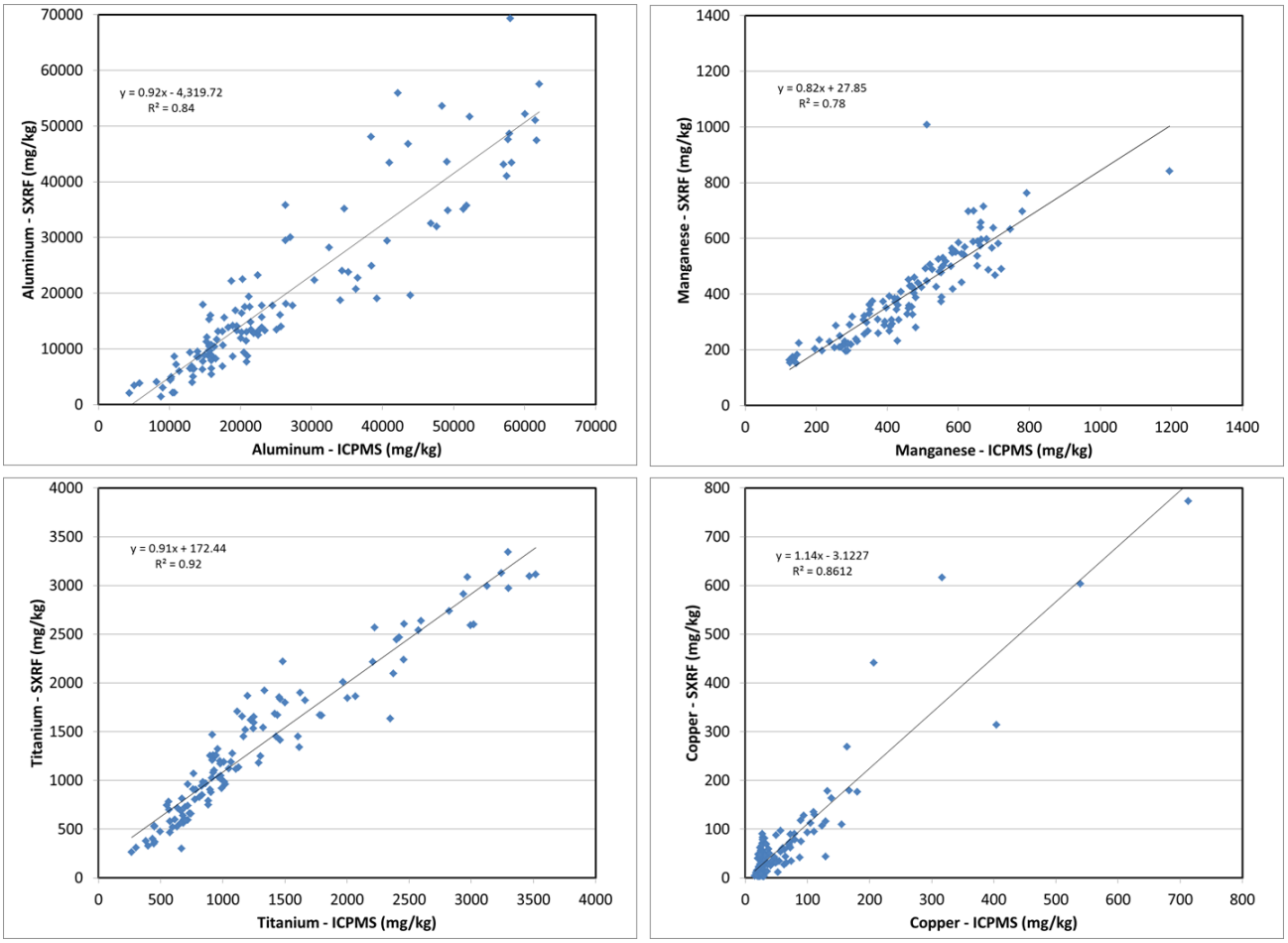

Figure 4.1 Bivariate correlation plots of the ICPMS and normalized SXRF data for the major soil elements not associated with evaporites (i.e., Al, Mn, and Ti) and one of the most abundant contaminants (Cu). The regression statistics for each bivariate correlation are shown in the upper left corner of the plots.

4.2 EPA Regional Screening Levels

The Environmental Protection Agency (EPA) is authorized by the Clean Air Act to establish air quality standards designed to protect human and ecological health. The actual risk to a given receptor depends upon the concentration of the contaminant, the exposure, and its inherent toxicity. Both the concentration and toxicity of a contaminant are relatively straightforward to measure. Exposure, on the other hand, is extremely difficult to quantify because it depends upon where the receptor is located, whether it moves, how much time is spent indoors versus outdoors, and the respiration rate. As a result, exposure assessments are typically time consuming and expensive and are only performed when necessary. To determine whether a site-specific exposure assessment is necessary, the EPA has established Regional Screening Levels (RSLs) for a large number of contaminants. The RSLs use conservative estimates for exposure to identify the ambient concentrations which would result in a target cancer risk of 1 in 1 million. Multiple RSLs exist for a given site depending on the degree of exposure (i.e., resident or industrial) and the exposure pathway (i.e., ingestion or inhalation). RSLs have been established for 808, 343, and 798 contaminants for soil, air, and tapwater, respectively. This

study will determine whether any of the species measured in the soil samples from the GSL playa exceed the RSLs established for residential or industrial exposures. Species which do not exceed the RSLs established by the EPA should not pose a health risk to the adjacent populations. Species with concentrations greater than the RSLs established by the EPA have the potential to adversely impact human health and should undergo a site-specific exposure assessment to determine the actual risk levels. The data presented in this section could also be used to assess ecological health risks. However, such an assessment is beyond the scope of this project.

4.3 PM_{10} Elemental Mass Fractions

Substantial effort was expended to dry, disaggregate, sieve, resuspend, and then collect the PM_{10} component of the GSL soil samples for subsequent elemental analysis. This effort was warranted because it is the PM_{10} particles which are considered to be respirable. Particles larger than 10 μm do no remain in the atmosphere for very long and are effectively removed from the airstream prior to entering the lungs. The ICPMS and SXRF analytical techniques were able to quantify a total of 53 elements in the resuspended soil samples (Table 4.1). 28 of these elements do not have health standards (i.e., RSLs). Data for these elements are included in section 4.3.1 for completeness and could be useful in the future if RSLs are established at a later date. Elements with mass fractions below both the Residential and Industrial RSLs are summarized in section 4.3.2. Elements with some values exceeding the Residential RSLs are summarized in section 4.3.3. Elements with some values exceeding the Industrial RSLs are summarized in section 4.3.4.

Most soils have a composition which closely matches the average abundance of elements in the Earth's crust (Table 4.2). However, the soil from the GSL lakebed is highly enriched in elements associated with evaporite minerals (e.g., Ca, Mg, S, Sr, Cl, Li, and B). Enrichment factors, which are defined as the measured mass fraction divided by the crustal mass fraction, are shown in Table 4.2 as well.

> *Typically, evaporite deposits occur in closed marine basins where evaporation exceeds inflow. The deposits often show a repeated sequence of minerals, indicating cyclic conditions with a mineralogy determined by solubility. The most important minerals and the sequence in which they form include calcite ($CaCO_3$), gypsum ($CaSO_4 \cdot 2H_2O$), anhydrite ($CaSO_4$), halite (NaCl), polyhalite ($K_2Ca_2Mg(SO_4)_4 \cdot 2H2O$), and lastly potassium and magnesium salts (e.g., KCl and $MgCl_2$). These sequences have been reproduced in laboratory experiments and, therefore, the physical and chemical conditions for evaporite formation are well known. In contrast to basin deposits, extensive thin-shelf deposits are known and are thought to be the result of shallow, ephemeral seas. Non-marine evaporites formed by streams flowing into closed depressions, especially in arid regions, give rise to deposits of borates, nitrates, and sodium carbonates. Such deposits occur in Utah and southern California in the United States.* (*Encyclopedia Britannica*, 2018)

Table 4.2 Comparison of the GSL PM_{10} Soil to the Average Abundance of Elements in the Earth's Crust (*Taylor and McLennan*, 1985).

Element	Avg Crustal Abundance (mg/kg)	Avg. GSL PM_{10} Soil Abundance (mg/kg)	Enrichment Factor		Element	Avg Crustal Abundance (mg/kg)	Avg. GSL PM_{10} Soil Abundance (mg/kg)	Enrichment Factor
Si	308000	69299	0.2		Pb	20	31	1.6
Al	80400	25508	0.3		Ga	17	29	1.7
Fe	35000	13294	0.4		B	15	315	**21.0**
Ca	30000	165099	**5.5**		Co	10	5.4	0.5
Na	28900	24322	0.8		Sc	11	4.7	0.4
K	28000	13480	0.5		Th	9.2	5.8	0.6
Mg	13300	59616	**4.5**		Pr	7.1	3.4	0.5
Ti	3000	1351	0.5		Sm	4.5	2.4	0.5
P	700	124	0.2		Gd	3.8	1.7	0.4
Mn	600	459	0.8		Cs	3.7	7.1	1.9
Ba	550	409	0.7		Dy	3.5	1.8	0.5
S	410	15720	**38.3**		Be	3.0	0.84	0.3
Sr	350	1681	**4.8**		U	2.8	5.8	**2.1**
Cl	279	41764	**150**		Er	2.3	1.0	0.4
Zr	190	4.4	<0.1		Yb	2.2	0.96	0.4
Rb	112	77	0.7		As	1.5	37	**24.7**
Zn	71	133	1.9		Mo	1.5	2.9	1.9
Ce	64	30	0.5		Cd	0.98	0.42	0.4
V	60	38	0.6		Eu	0.88	0.48	0.5
Se	50	0.65	<0.1		Ho	0.80	0.35	0.4
Cr	35	39	1.1		Tl	0.75	0.29	0.4
La	30	15	0.5		Tb	0.64	0.30	0.5
Nd	26	13	0.5		Lu	0.32	0.13	0.4
Cu	25	64	**2.6**		Sb	0.2	2.2	**11**
Y	22	11	0.5		Ag	0.05	0.22	**4.4**
Li	20	145	**7.3**		Br	NA	53	NA
Ni	20	20	1.0					

Strontium carbonate ($SrCO_3$) typically coprecipitates with gypsum (*Gogda et al.*, 2017) while lithium and boron are commonly found in concentrated brine solutions associated with terminal basin lakes (*Peiro et al.,* 2013). The fact that neither sodium nor potassium have enrichment factors >1 should not be interpreted as the absence of significant quantities of NaCl or KCl. Rather, the lower enrichment factors result from the fact that much of the normal soil has been displaced by evaporites. This contention is supported by the low enrichment factors for Si, Al, Fe, and Ti, which are all < 0.5.

The enrichment factor analysis also reveals that several heavy metals are significantly enhanced in the PM_{10} soil from the GSL relative to the average crustal abundance. The enrichment factors for As, Sb, Ag, Cu, and U were 24.7, 11, 4.4, 2.6, and 2.1, respectively. Although some of these values are quite high, they do not necessarily indicate the presence of industrial or municipal pollution. It is possible that the enhancements merely reflect regional geologic composition traits which differ from the globally-averaged values. Further analysis will be presented in Section 6 to determine whether these enhancements are due to natural or anthropogenic processes.

A summary of all the PM_{10} soil elemental mass fraction data is shown in Figure 4.2. The median for each element is identified by a round circle while the interquartile ranges (i.e., between the 25th and 75th percentiles) are indicated by the solid blue boxes. The solid lines indicate ±2.7σ (i.e., standard deviation). For a normally-distributed dataset, ±2.7σ would encompass 99.3% of the data. Outliers are shown as small red dots. The entire PM_{10} mass fraction data set for all DUs and SUs is included as Appendix G.

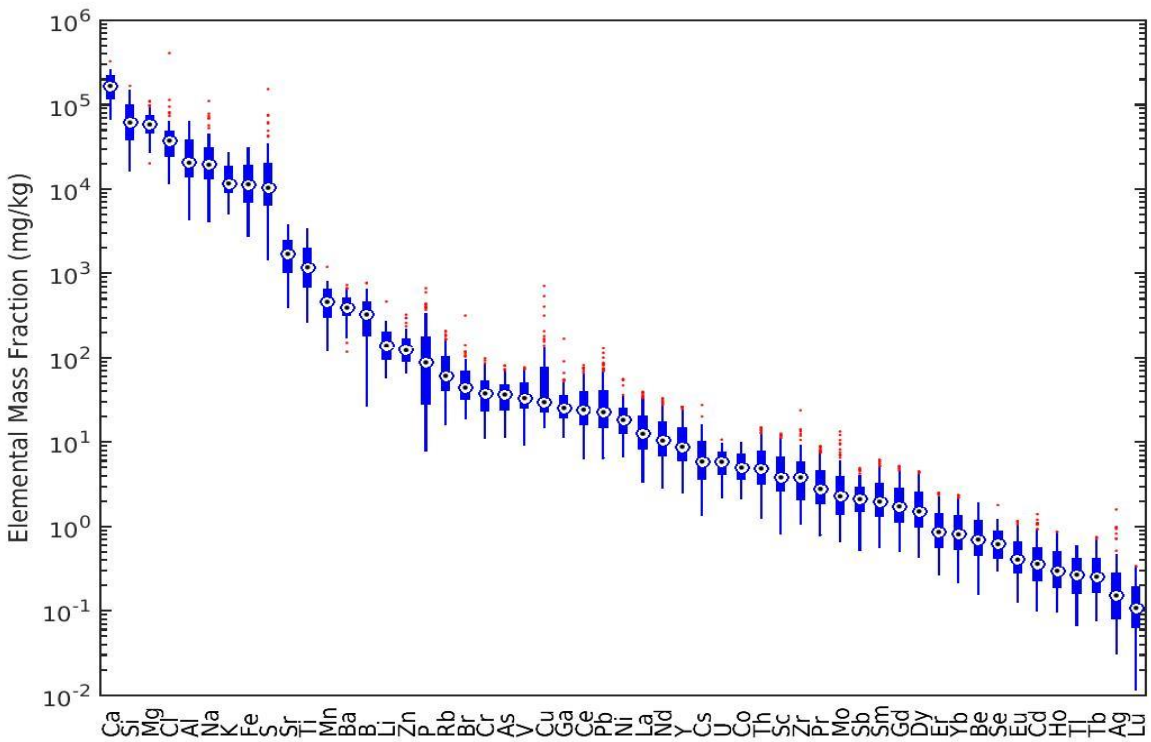

Figure 4.2 Elemental mass fractions for all of the PM_{10} soil samples collected from the exposed lakebed of the GSL. The median for each element is identified by a round circle while the interquartile ranges (i.e., between the 25th and 75th percentiles) are indicated by the solid blue boxes. The solid lines indicate ±2.7σ (i.e., standard deviation). For a normally-distributed dataset, ±2.7σ would encompass 99.3% of the data. Outliers are shown as small red dots.

4.3.1 Elements Without Health Standards

None of the elements shown in Figures 4.3 through 4.7 are in the EPA RSL database indicating that no known health hazards currently exist.

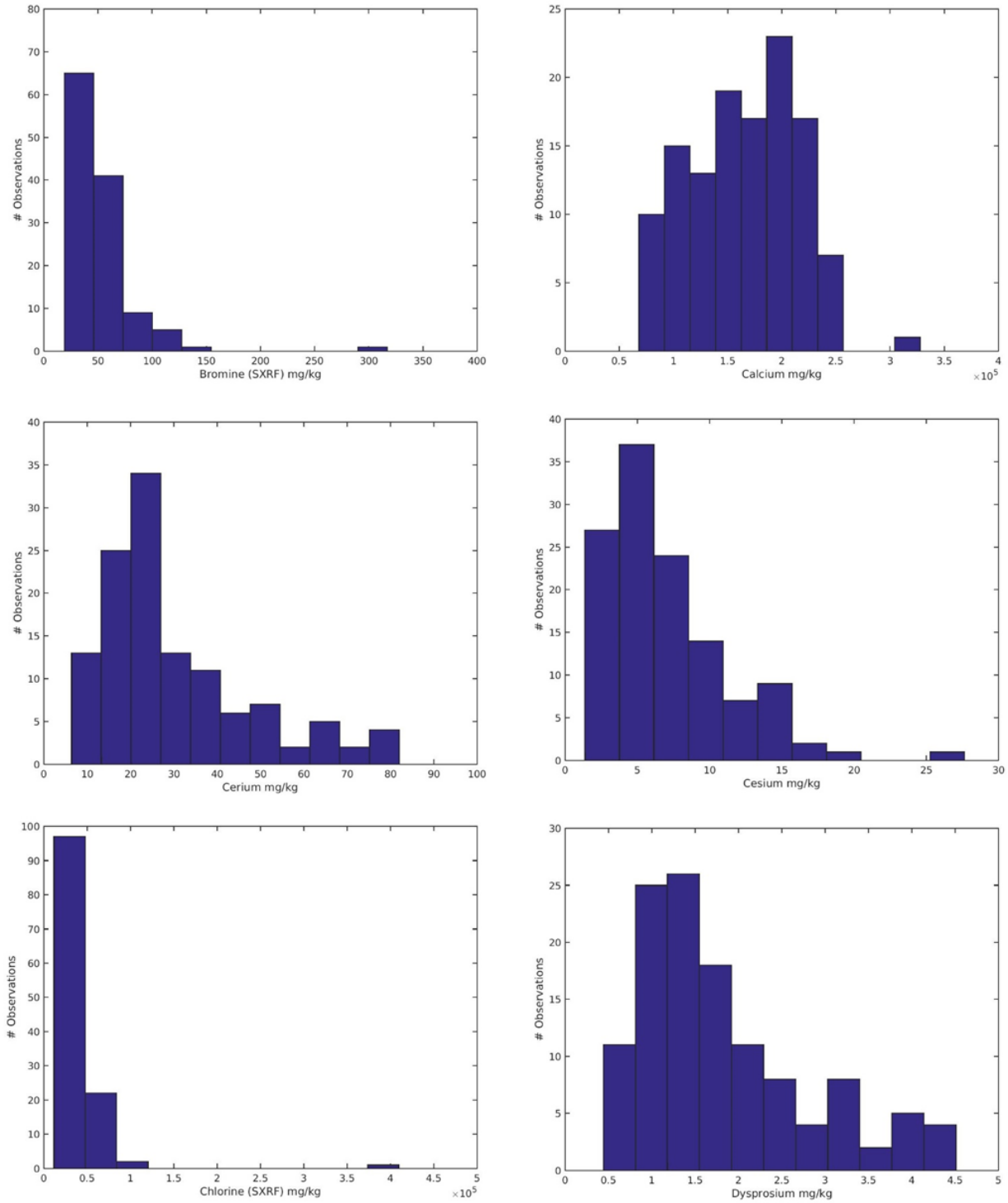

Figure 4.3 Histograms of PM_{10} soil elemental mass fractions (mg/kg) for Br, Ca, Ce, Cs, Cl and Dy.

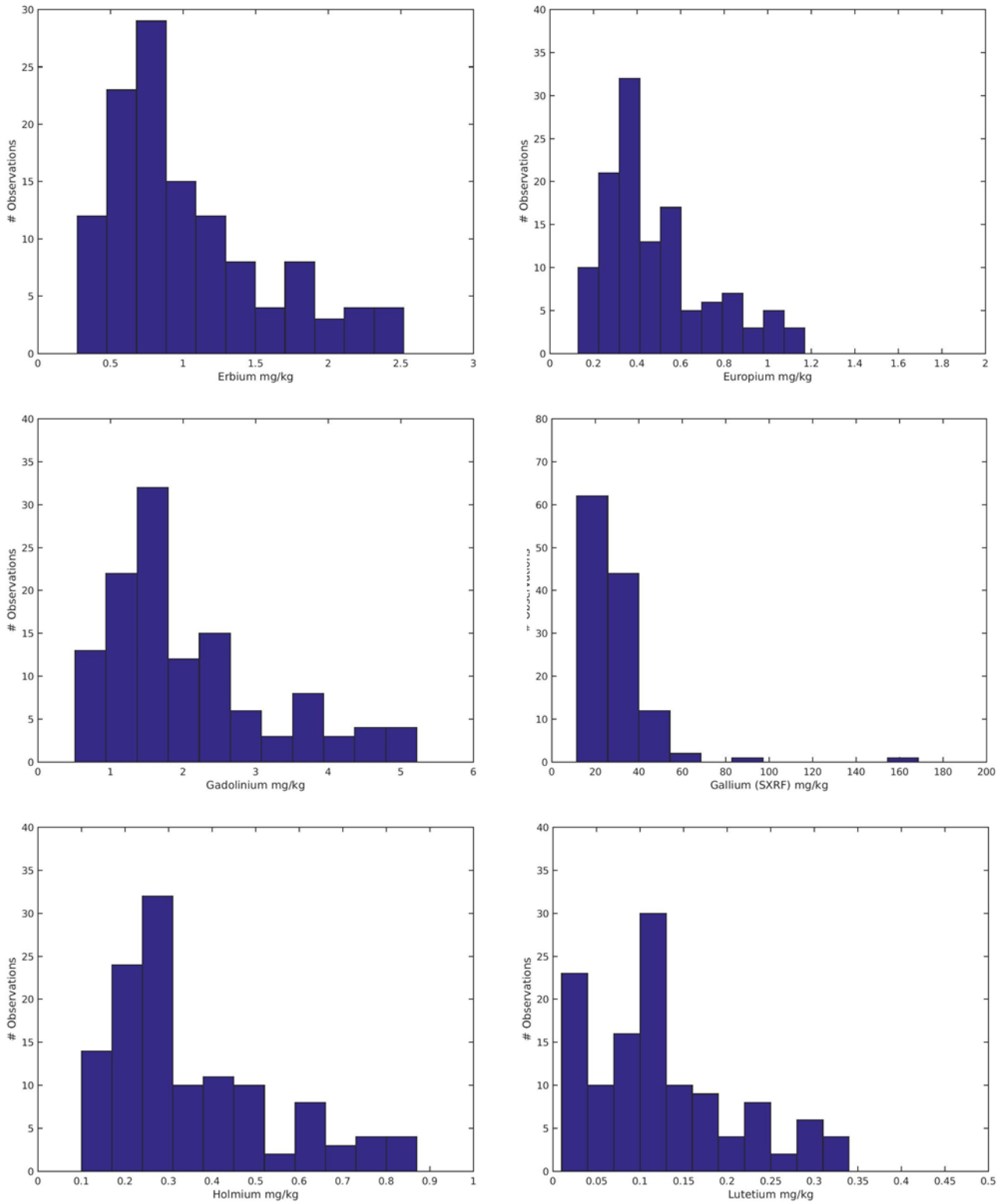

Figure 4.4 Histograms of PM_{10} soil elemental mass fractions (mg/kg) for Er, Eu, Gd, Ga, Ho, and Lu.

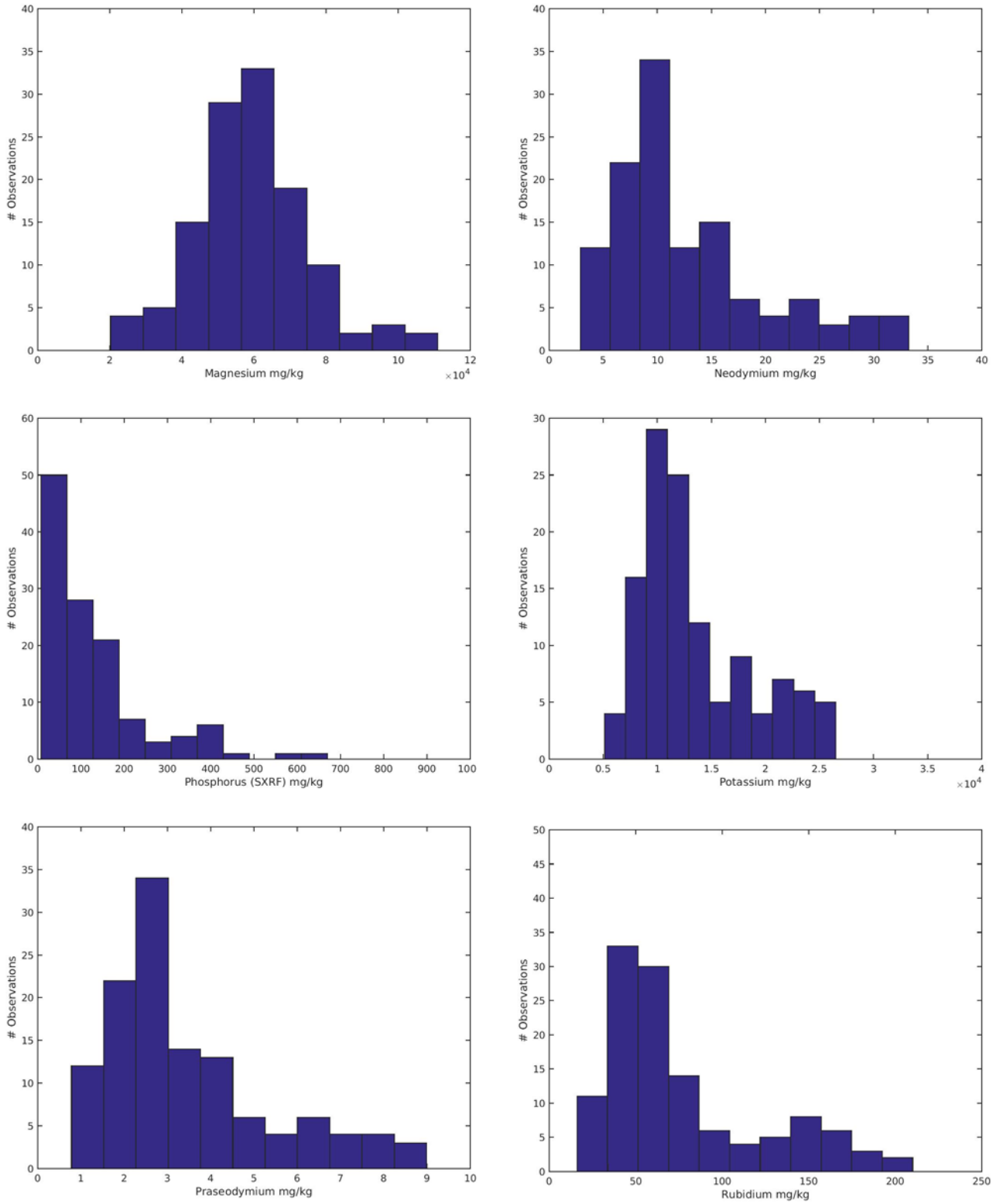

Figure 4.5 Histograms of PM_{10} soil elemental mass fractions (mg/kg) for Mg, Nd, P, K, Pr and Rb.

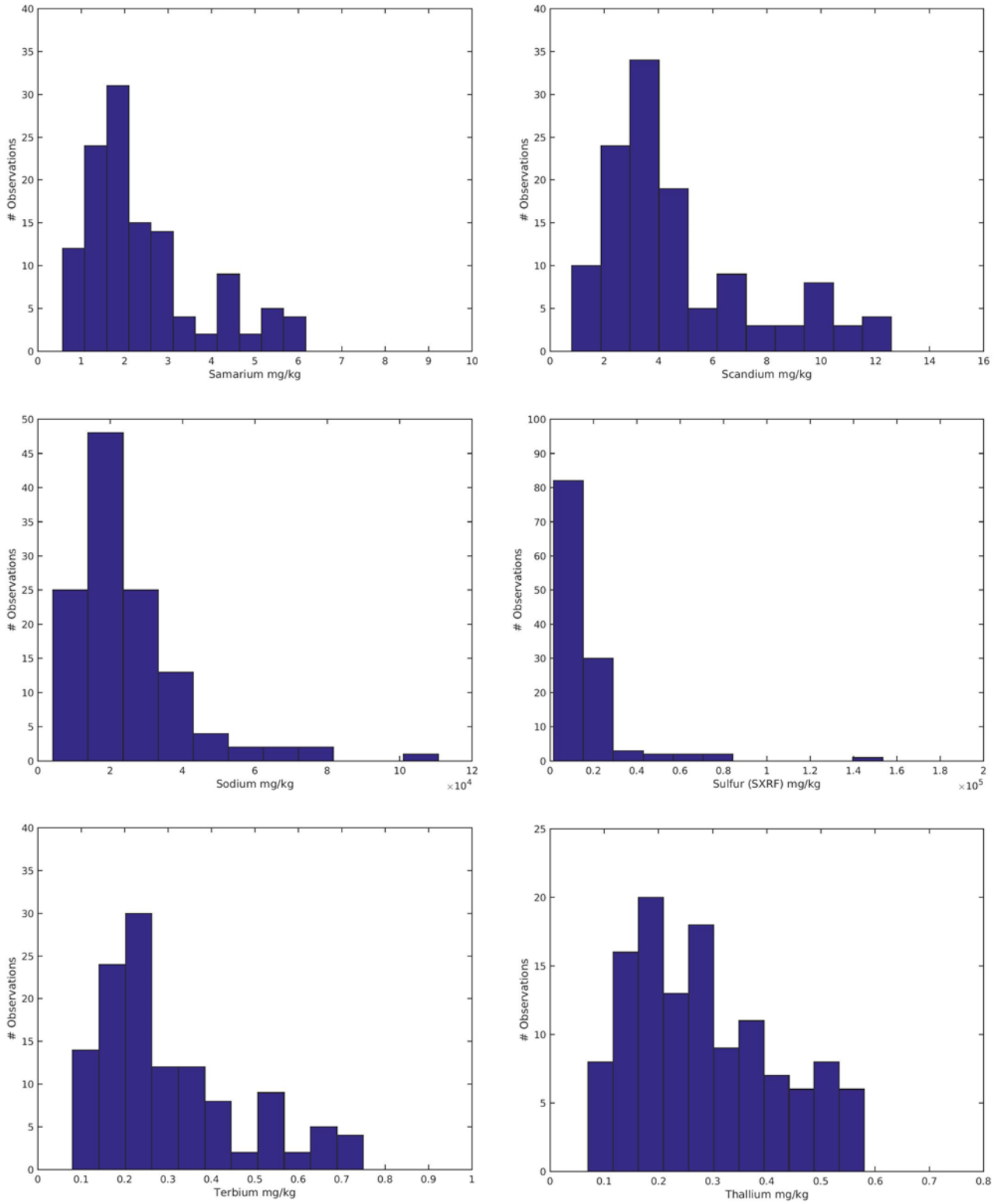

Figure 4.6 Histograms of PM_{10} soil elemental mass fractions (mg/kg) for Sm, Sc, Na, S, Tb, and Tl.

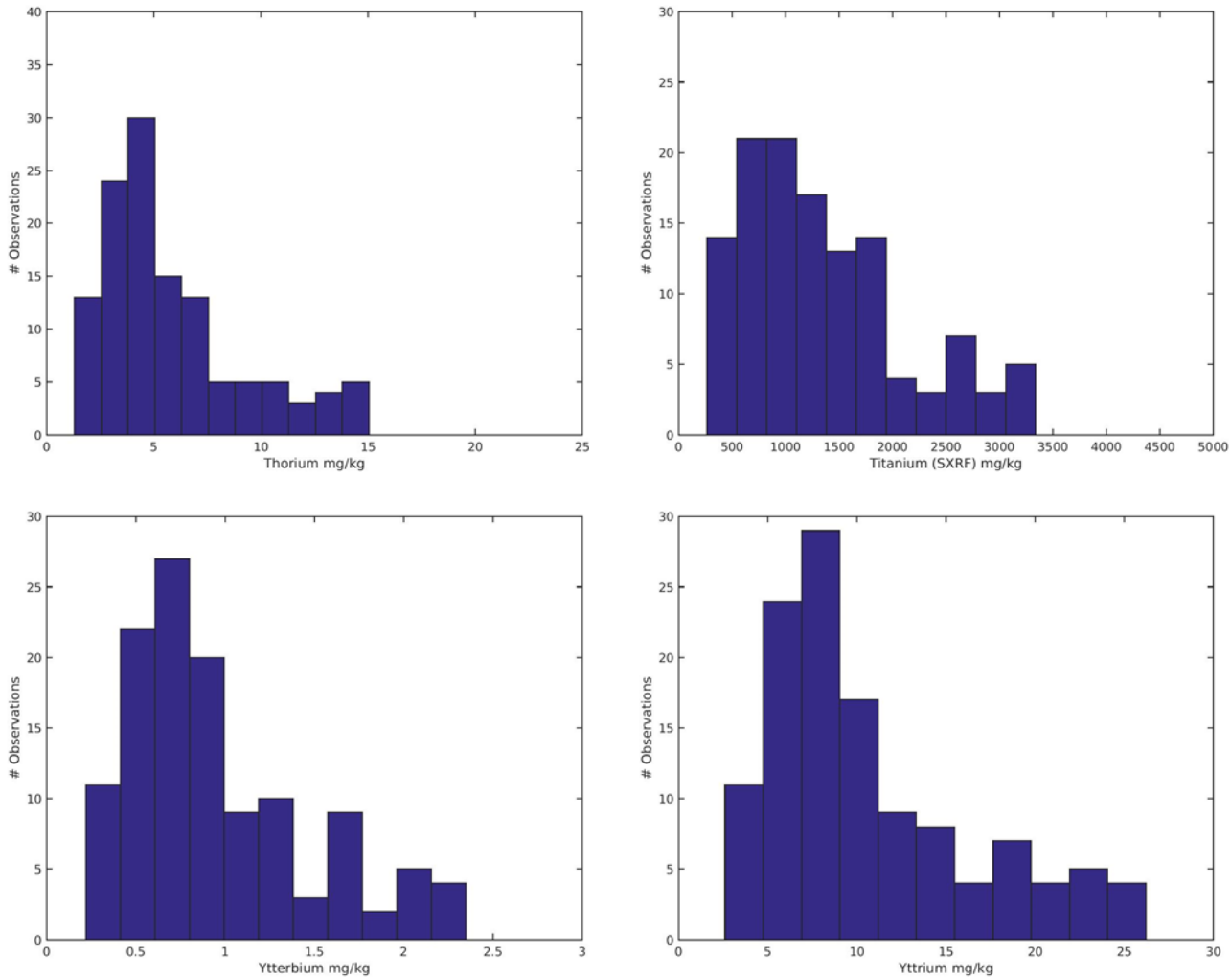

Figure 4.7 Histograms of PM_{10} soil elemental mass fractions (mg/kg) for Th, Ti, Yb, and Y.

4.3.2 Elements Below Health Standards

None of the elements shown in Figures 4.8 through 4.10 exceed the EPA Composite Residential or Industrial RSLs for a target cancer risk (TR) of 1 in 1 million and a target hazard quotient (THQ) of 0.1.

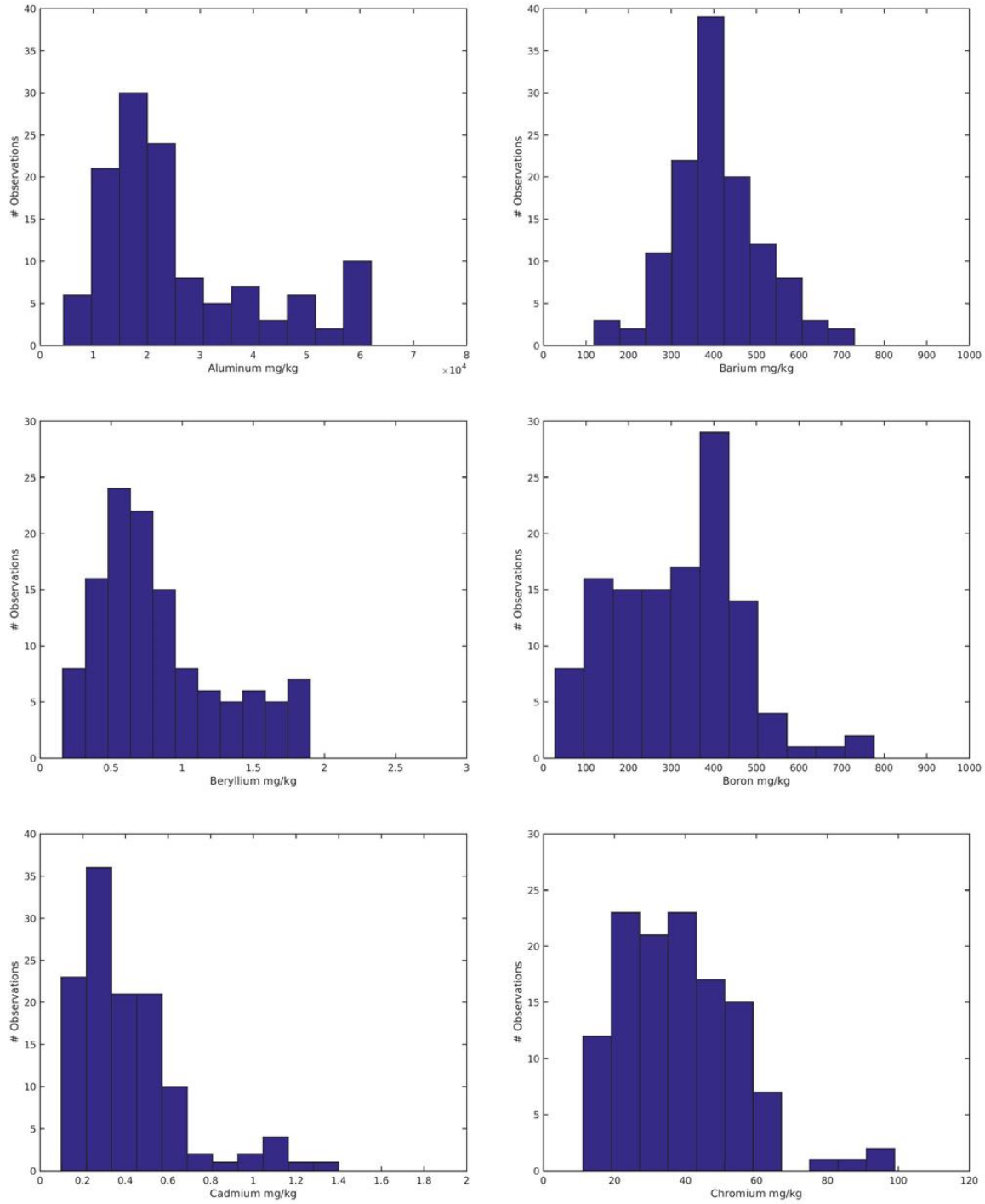

Figure 4.8 Histograms of PM_{10} soil elemental mass fractions (mg/kg) for Al, Ba, Be, B, Cd, and Cr.

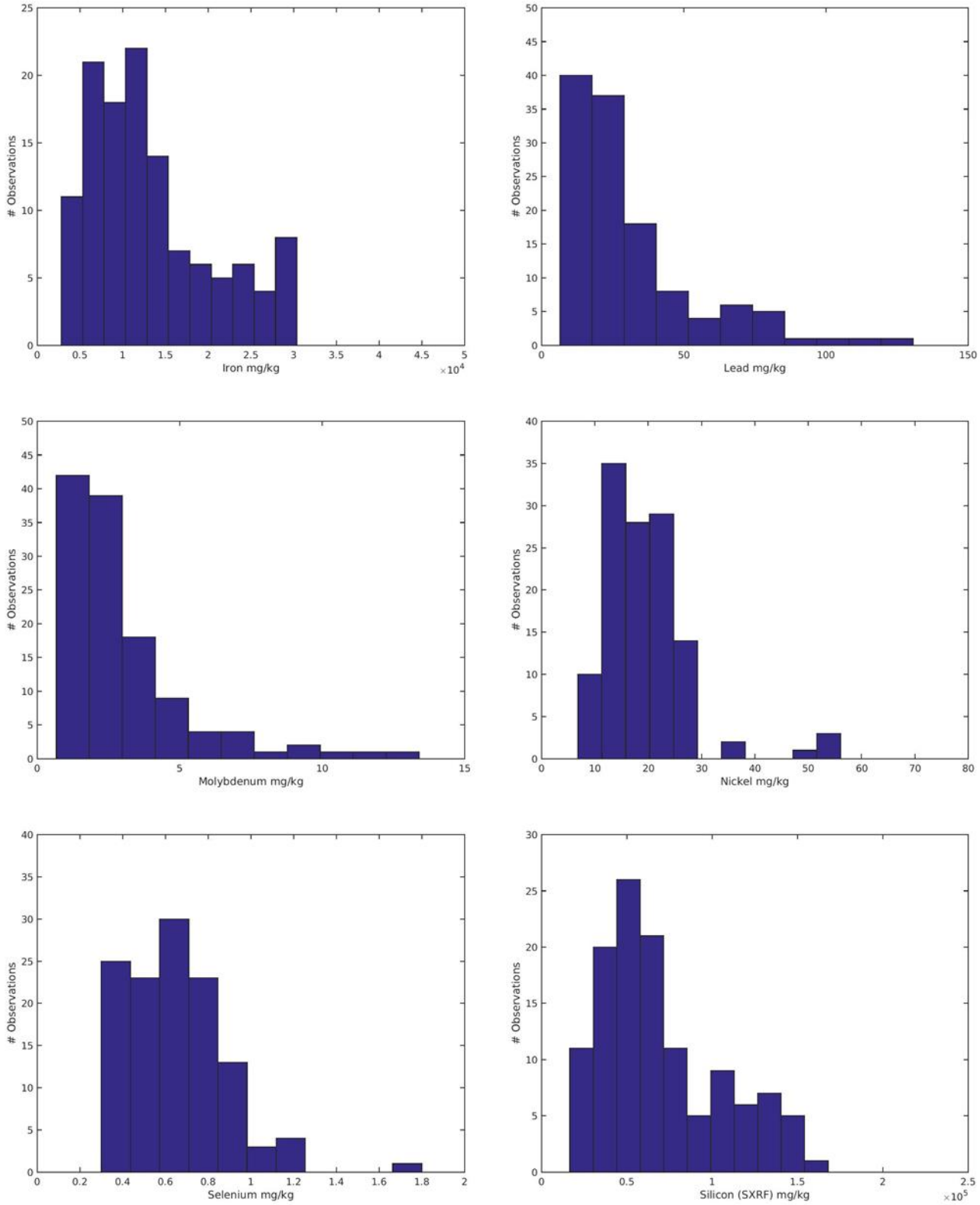

Figure 4.9 Histograms of PM_{10} soil elemental mass fractions (mg/kg) for Fe, Pb, Mo, Ni, Se, and Si.

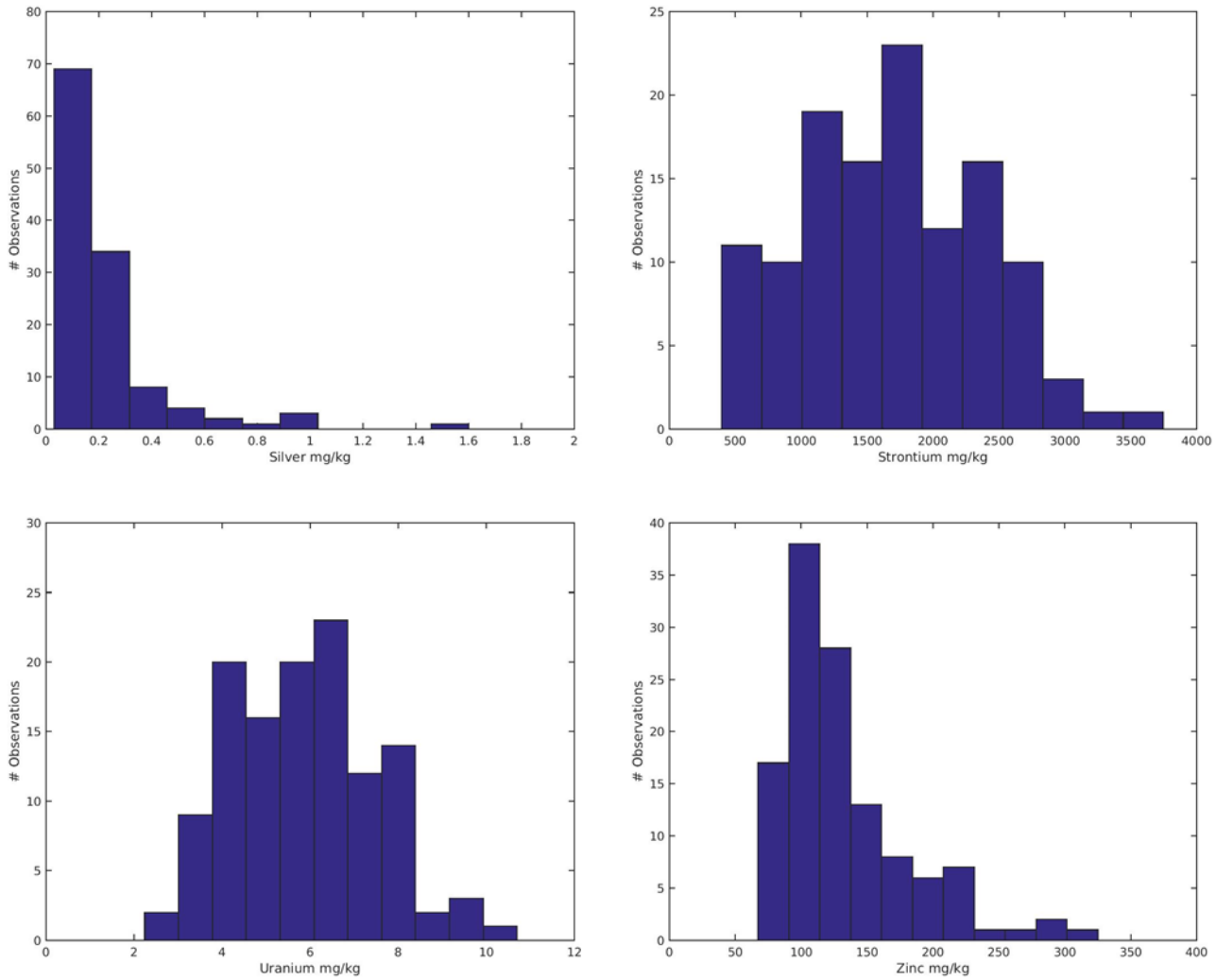

Figure 4.10 Histograms of PM_{10} soil elemental mass fractions (mg/kg) for Ag, Sr, U, and Zn.

4.3.3 Elements Exceeding Residential RSLs

All of the elements shown in Figure 4.11 have some values which exceed the EPA Composite Residential, but not the Industrial, RSLs for a target cancer risk (TR) of 1 in 1 million and a target hazard quotient (THQ) of 0.1.

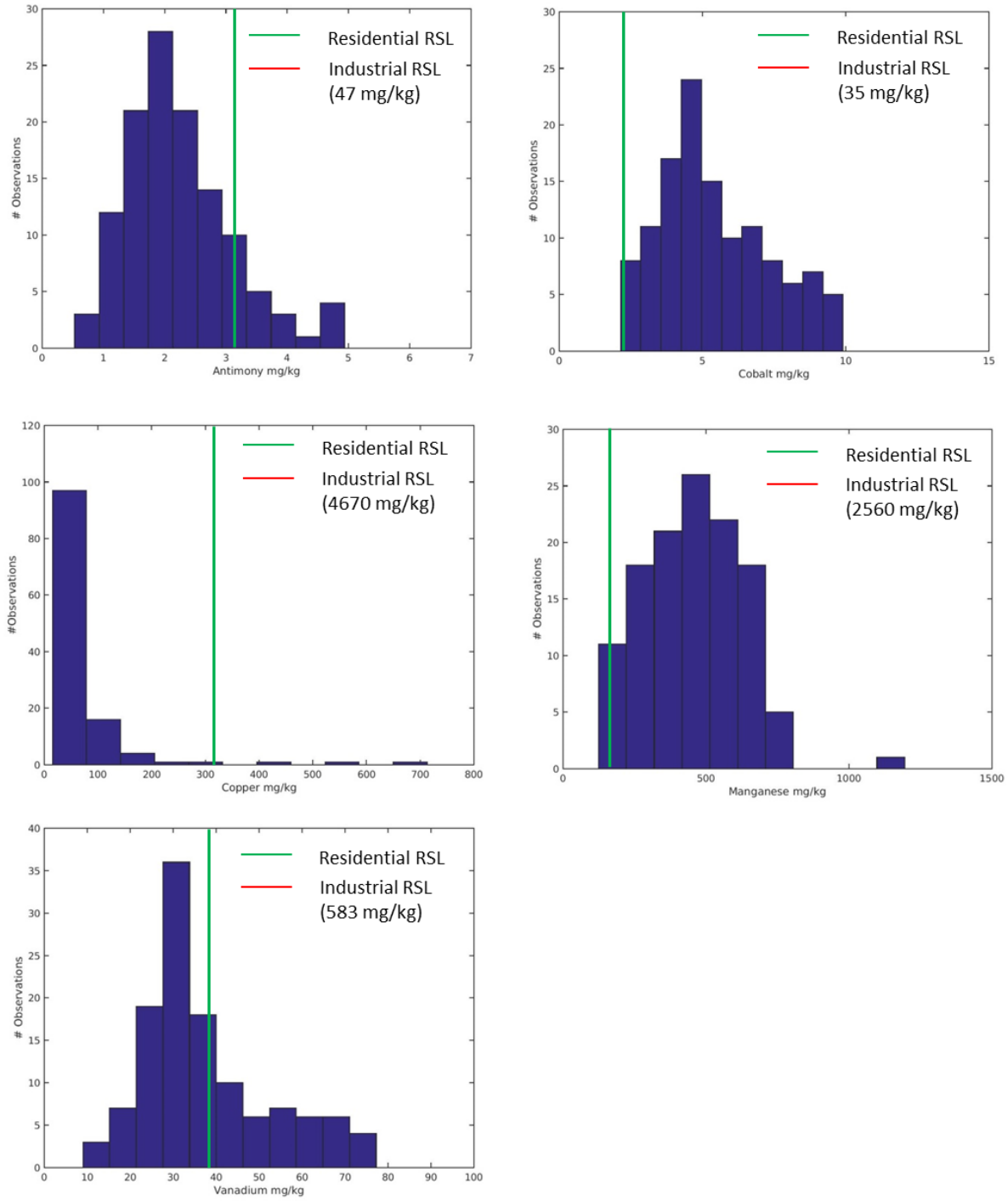

Figure 4.11 Histograms of PM_{10} soil elemental mass fractions (mg/kg) for Sb, Co, Cu, Mn, and V.

4.3.4 Elements Exceeding Industrial RSLs

All of the elements shown in Figure 4.12 have some values which exceed the EPA Composite Residential and Industrial RSLs for a target cancer risk (TR) of 1 in 1 million and a target hazard quotient (THQ) of 0.1. In the case of As, all of the observed values were greater than the Industrial RSL.

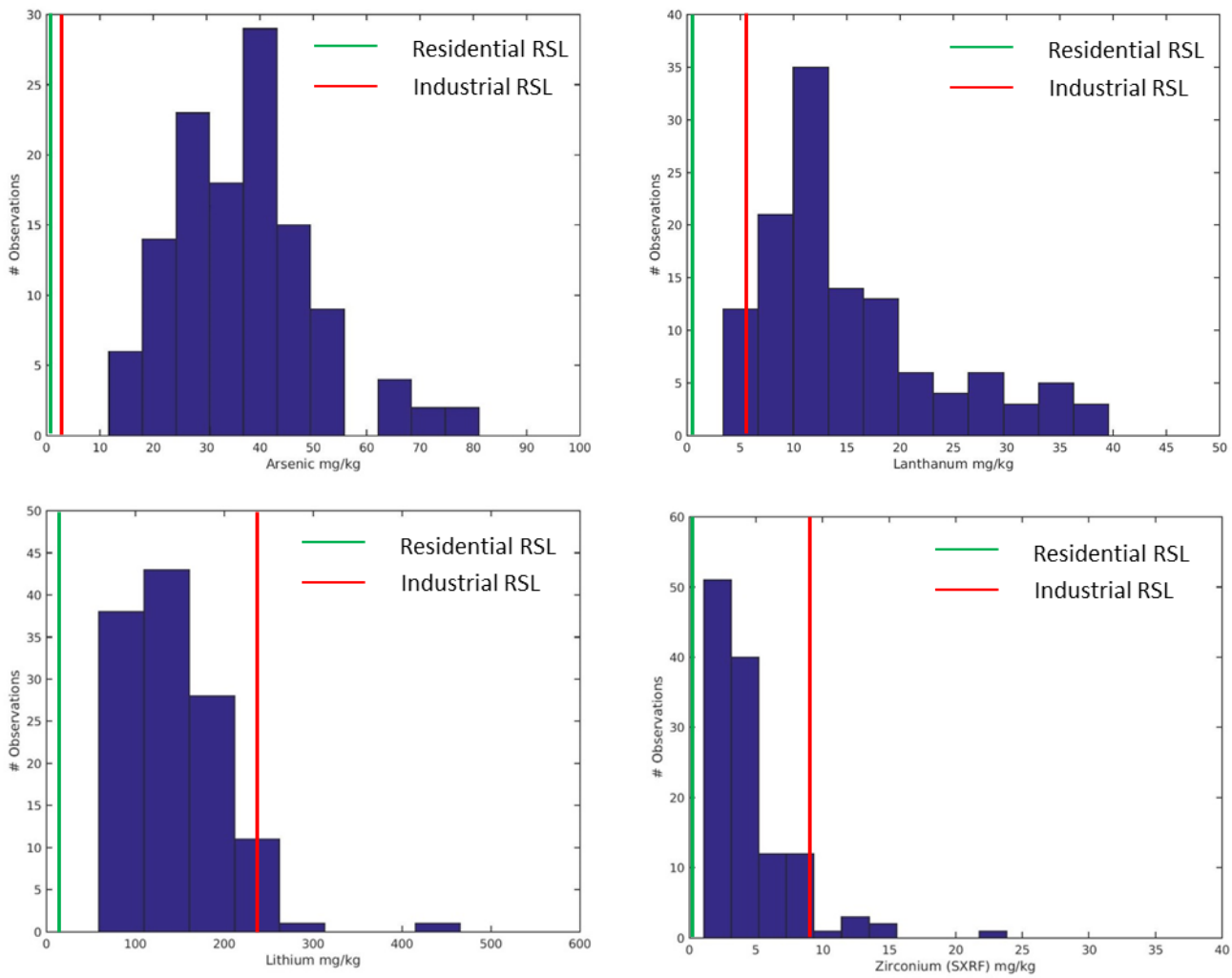

Figure 4.12 Histograms of PM_{10} soil elemental mass fractions (mg/kg) for As, La, Li, and Zr.

4.4 Key Findings/Uncertainties

Key findings

- The PM_{10} soil from the GSL lakebed is highly enriched in elements associated with evaporite minerals (e.g., Ca, Mg, S, Sr, Cl, Li, and B).
- 28 of the 53 elements measured do not currently have health standards and, as such, pose no known health risks. These elements include: Br, Ca, Ce, Cl, Cs, Dy, Er, Eu, Ga, Gd, Ho, K, Lu, Mg, Na, Nd, P, Pr, Rb, S, Sc, Sm, Tb, Th, Ti, Tl, Y, and Yb.

- 16 of the elements measured were below both the Residential and Industrial RSLs established by the EPA and, therefore, pose no health risks to adjacent populations. These elements include: Ag, Al, B, Ba, Be, Cd, Cr, Fe, Mo, Ni, Pb, Se, Si, Sr, U, and Zn.

- 5 of the elements measured had some values which exceeded the Residential, but not the Industrial, RSLs established by the EPA. These elements include: Co, Cu, Mn, Sb, and V.

- 4 of the elements measured had some values which exceeded both the Residential and Industrial RSLs established by the EPA. These elements include: As, La, Li, and Zr.

- Site-specific exposure assessments should be performed for As, Co, Cu, La, Li, Mn, Sb, V, and Zr to determine whether the measured concentrations of these elements pose health risks at the observed exposure frequencies.

Uncertainties

- The valence state of Cr has a huge impact on its toxicity with Cr(VI) being much more toxic than Cr(III). The comparison of Cr to the RSLs assumed that all of the Cr was in the form of Cr(III). Follow-up work should be conducted to verify this assumption.

- Although 9 elements exceeded the Residential RSLs established by the EPA, it does not necessarily mean that these elements pose a health risk to adjacent populations because the exposure frequency used in the RSL calculation is extremely conservative. To determine the actual health risk, a site-specific exposure assessment for these elements should be performed.

- The PM_{10} elemental data presented in this report represent the composition of the top 1 cm of the exposed lakebed. Deeper samples (i.e., 1-4 cm) were collected as part of this study but not analyzed. Thus, the composition of the PM_{10} soil in dust plumes originating from the exposed lakebed could change if the top 1 cm is deflated (i.e. removed from the surface) through the process of wind erosion.

- This study did not investigate the impact of GSL dust plumes on the local PM_{10} or $PM_{2.5}$ concentrations. If the GSL generates PM_{10} or $PM_{2.5}$ concentrations greater than the threshold values established by the EPA for criteria pollutants, then the dust could pose a health hazard even if none of the constituent components (i.e., heavy metals) are deemed hazardous during a site-specific exposure assessment.

- This study did not investigate potential biological hazards contained in the dust from the GSL.

5. How Will Lake Elevation Fluctuations Impact Dust Production?

5.1 Methodology

During the Fall of 2016, the Automated Geographic Reference Center (AGRC), Utah Geological Survey, and the Utah Division of Forestry, Fire and State Lands acquired detailed elevation data for almost the entire exposed lakebed of the GSL (Fig. 5.1). The data were acquired by installing a LiDAR system onto an aircraft and flying a gridded pattern over the exposed lakebed. The LiDAR system sent out a pulsed laser light beam toward the ground and measured the time required for the laser light beam to reflect off the surface and return to the aircraft. The return time was then used in conjunction with aircraft altitude and position data to determine the elevation of underlying surface with a high degree of accuracy. The root-mean-square error (RMSE) of the resultant dataset was determined to be ≤ 10 cm. This study used the bare-earth digital elevation model (DEM). The GPS coordinates of each surface crust sample identified as having visible fines were combined with the bare-earth DEM in the Global Mapper (v19.1.0) software package to determine the elevation of each potential dust source "hot spot".

The calibration of the bare-earth DEM was tested by 1) comparing the GSL elevation derived from the LiDAR data with the USGS direct measurements of the lake elevation, and 2) comparing the LiDAR data to the bathymetry data set of the lakebed obtained in 2005 and 2006 by the US Geological Survey (USGS). The overlap between the bathymetry data and the LiDAR data is limited to elevations between 4194 ft and 4200 ft.

The LiDAR data was acquired during 48 flights which occurred on 26 days between 09/03/2016 and 11/30/2016. The lake elevation statistics for the days on which flights occurred are shown in Table 5.1. The average difference between the USGS and LiDAR data is approximately 3.5 ft with the LiDAR data being higher. We do not know the reason for this discrepancy, but will adjust all of the LiDAR data down by 3.5 ft so that it matches the USGS lake elevation data.

Table 5.1 Comparison of USGS GSL Elevation Data with LiDAR Data.

	Average GSL Elevation (ft)	Maximum GSL Elevation (ft)	Minimum GSL Elevation (ft)	Standard Deviation GSL Elevation (ft)
Saltair Boat Harbor (Southern GSL)	4192.45	4192.69	4192.30	0.10
LiDAR (Southern GSL)	4195.98	NA	NA	NA
Difference	**3.53**			
Saline (Northern GSL)	4189.18	4189.33	4189.02	0.10
LiDAR (Northern GSL)	4192.66	NA	NA	NA
Difference	**3.48**			

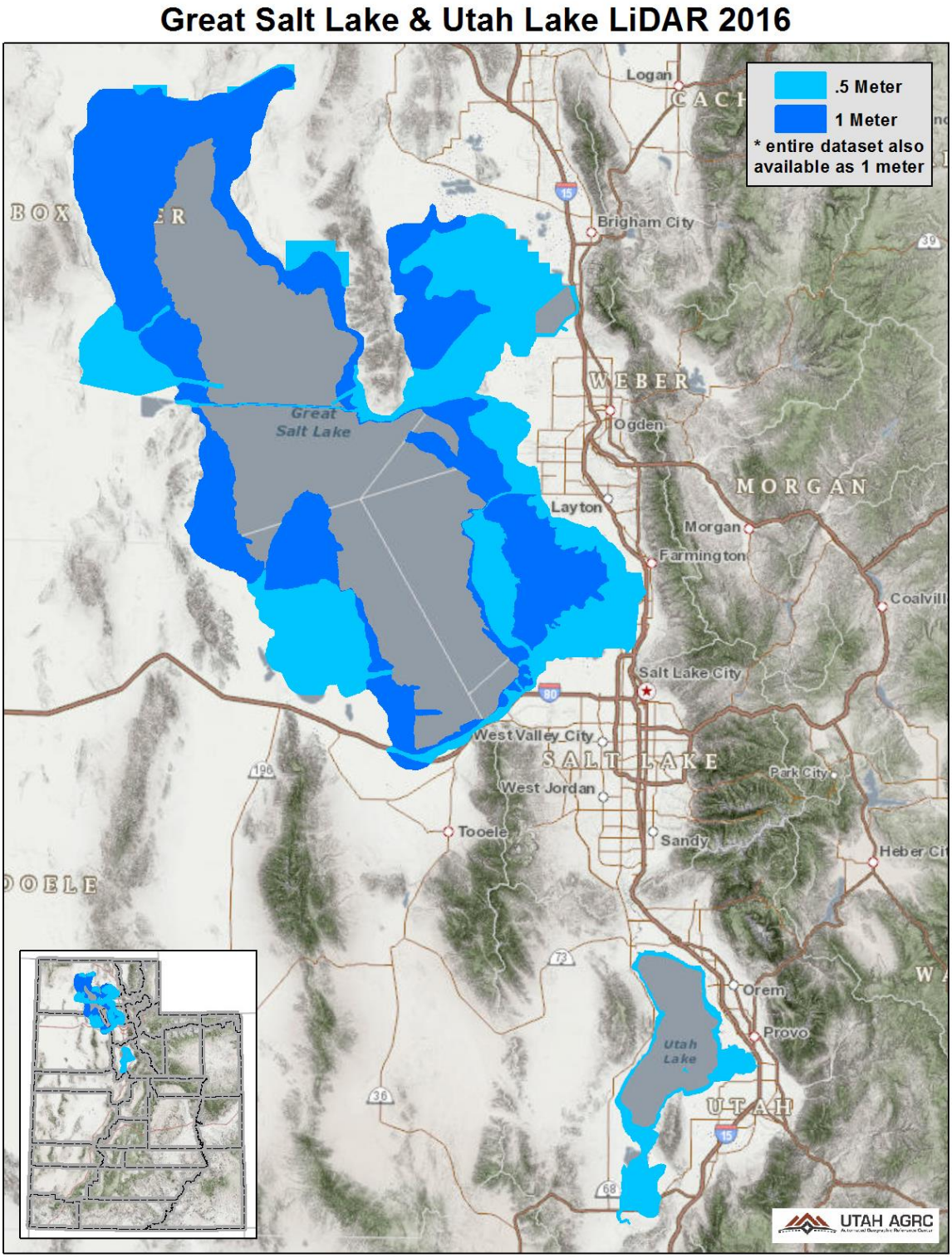

Figure 5.1 Map showing the coverage of the 0.5-m (light blue) and 1-m (dark blue) resolution digital elevation model derived from aircraft LiDAR data collected during the fall of 2016.

A second check of the LiDAR data calibration was performed by comparing the LiDAR data with the USGS bathymetry data collected in 2005 and 2006 when the lake was higher. The results of this comparison are shown in Figure 5.2. Although the LiDAR and bathymetric data for these 25 spot checks are highly correlated with an R^2 of 0.92, there is an offset of approximately 4 ft with the LiDAR once again being higher. Thus, this represents a second piece of evidence indicating that that the LiDAR data must be adjusted downward prior to use.

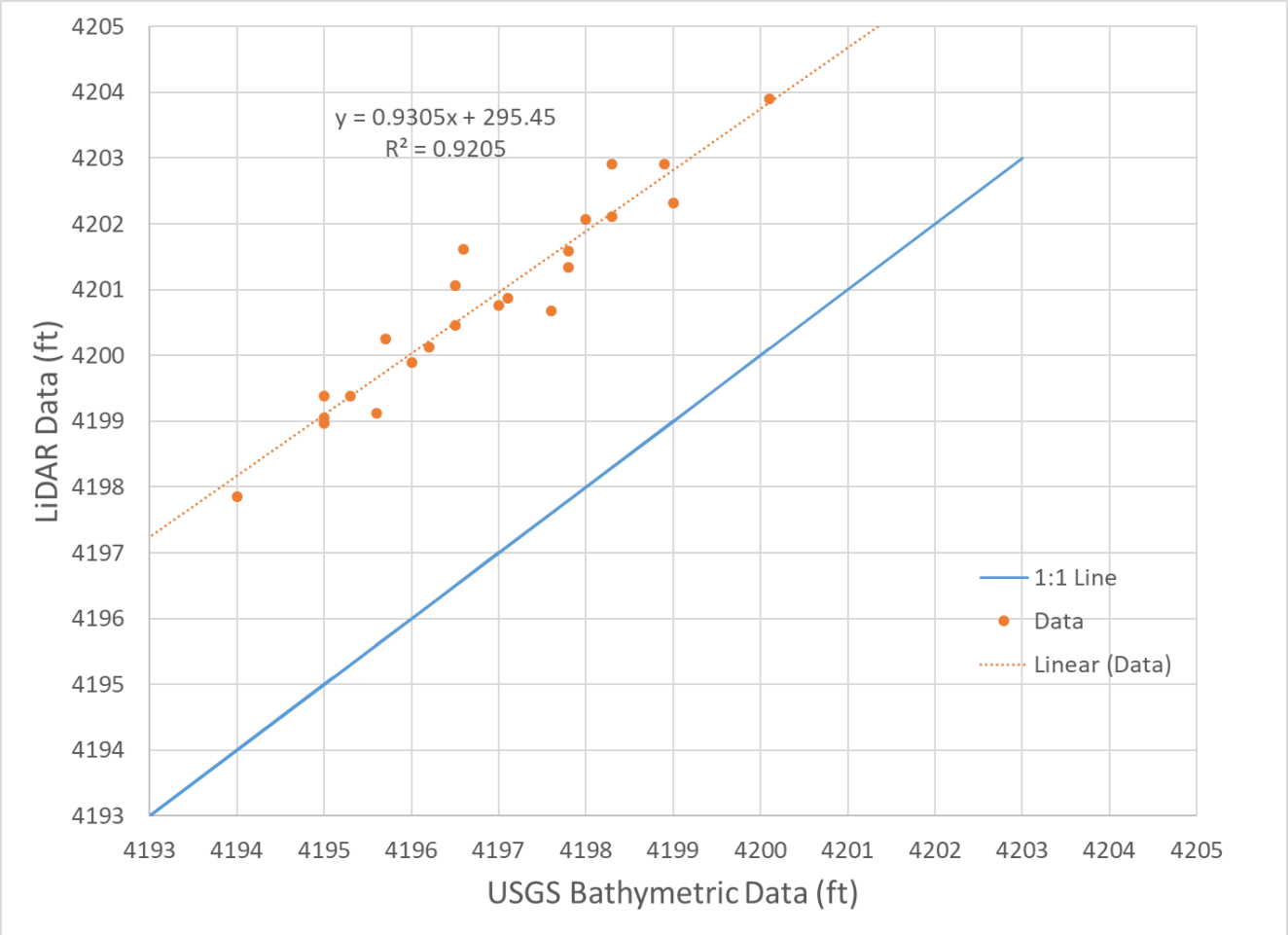

Figure 5.2 Comparison of the LiDAR elevation data with the USGS bathymetric data.

5.2 Visible Fines Elevation Distribution

A histogram of the elevation distribution of all locations with visible fines is shown in Figure 5.3. The mean, median, and standard deviation of the distribution are 4201.6 ft, 4201.0 ft, and 3.94 ft, respectively. Thus, 50% of the locations capable of generating dust plumes if the surface is disturbed are at elevations less than 4201.0 ft. The truncation of the distribution below 4195 ft results from the fact that the lake level fluctuated between 4192.0 and 4195.5 ft during this study (Fig. 2.3).

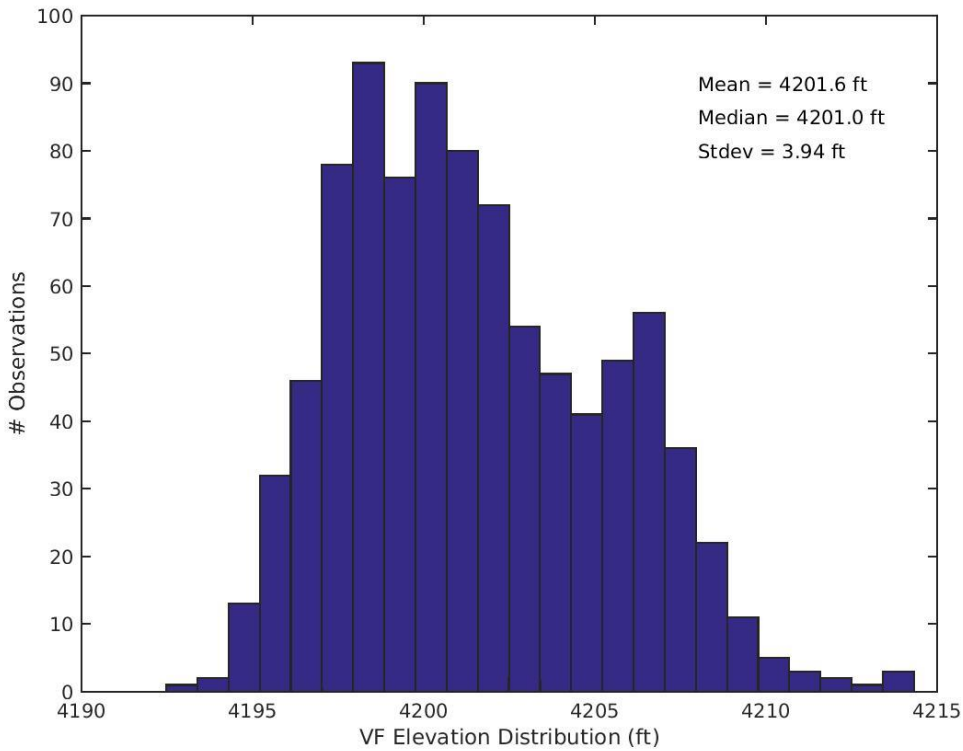

Figure 5.3 Histogram of the elevations of all the locations with visible fines (VF).

5.3 Dust "Hot Spot" Elevation Distributions

A histogram of the elevation distribution of all the GSL dust "hot spots" is shown in Figure 5.4. The mean, median, and standard deviation of the distribution are 4200.9 ft, 4200.6 ft, and 3.43 ft, respectively. Thus, 50% of the locations currently generating dust plumes under appropriate meteorological conditions are at elevations less than 4200.6 ft. The elevation distribution of the dust "hot spots" differ for the northern and southern portions of the GSL (Fig. 5.5). This figure shows that the dust "hot spots" located in the southern half of the GSL generally occur at a lower elevation than those in the northern half.

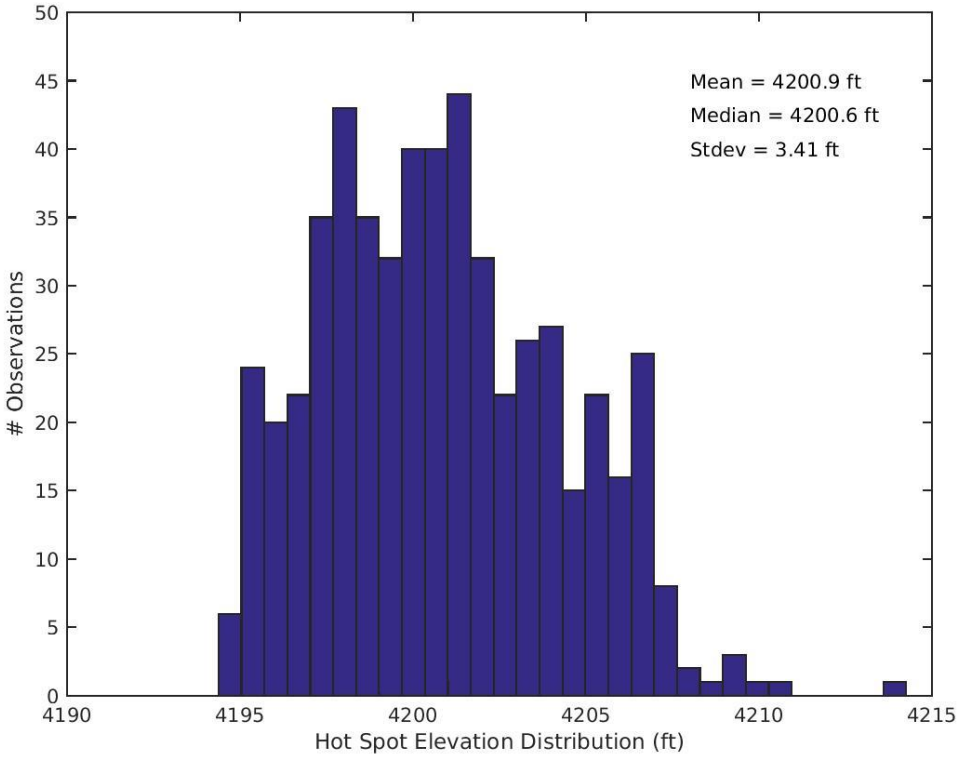

Figure 5.4 Histogram of the elevations of all the GSL dust "hot spots".

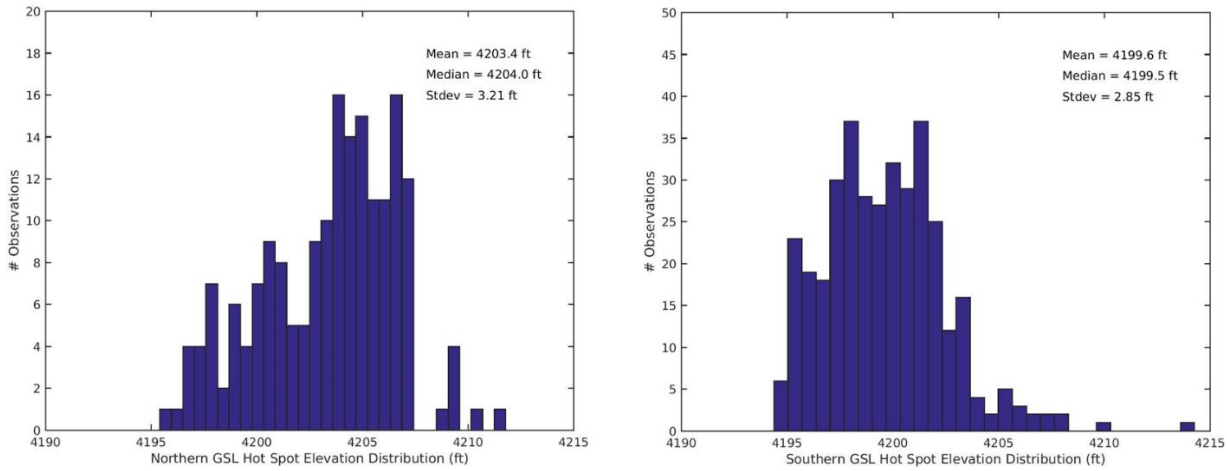

Figure 5.5 Histograms of the elevations of the GSL dust "hot spots" located in the northern (left) and southern (right) halves of the lake.

5.4 Effects of Lake Elevation Fluctuations on the Number of Dust "Hot Spots"

The GSL was divided into four quadrants (i.e., Farmington Bay, Bear River Bay, Gilbert Bay, and Gunnison Bay) to determine how each section of the lakebed responds to fluctuating water levels using a DEM based upon the recalibrated LiDAR data. The results for Farmington Bay are shown in Figure 5.6. This figure shows that 30% of the dust "hot spots" will be covered by water when the GSL elevation is 4197 ft and that 90% of the dust "hot spots" will be covered by water when the GSL elevation is 4201.5 ft. The distribution shown in Figure 5.6 is linear with a Pearson correlation coefficient (R^2) of 0.9973. The slope of 0.1383 indicates that a 1-foot increase in the lake elevation will decrease the number of dust "hot spots" by 13.8% over the range of GSL elevations from 4195.1 ft through 4201.7 ft. Although it is tempting to extrapolate the linear trend beyond the range of the data, it is not advisable. For example, the highest elevation of a dust "hot spot" in Farmington Bay was 4213.5 ft which indicates that the trend does not continue beyond the 0.95 fractional coverage. In addition, nearly the entire area of Farmington Bay is dry when the GSL elevation drops below 4194 ft. As a result, further reductions in lake elevation beyond this threshold level will not expose much more surface area within Farmington Bay.

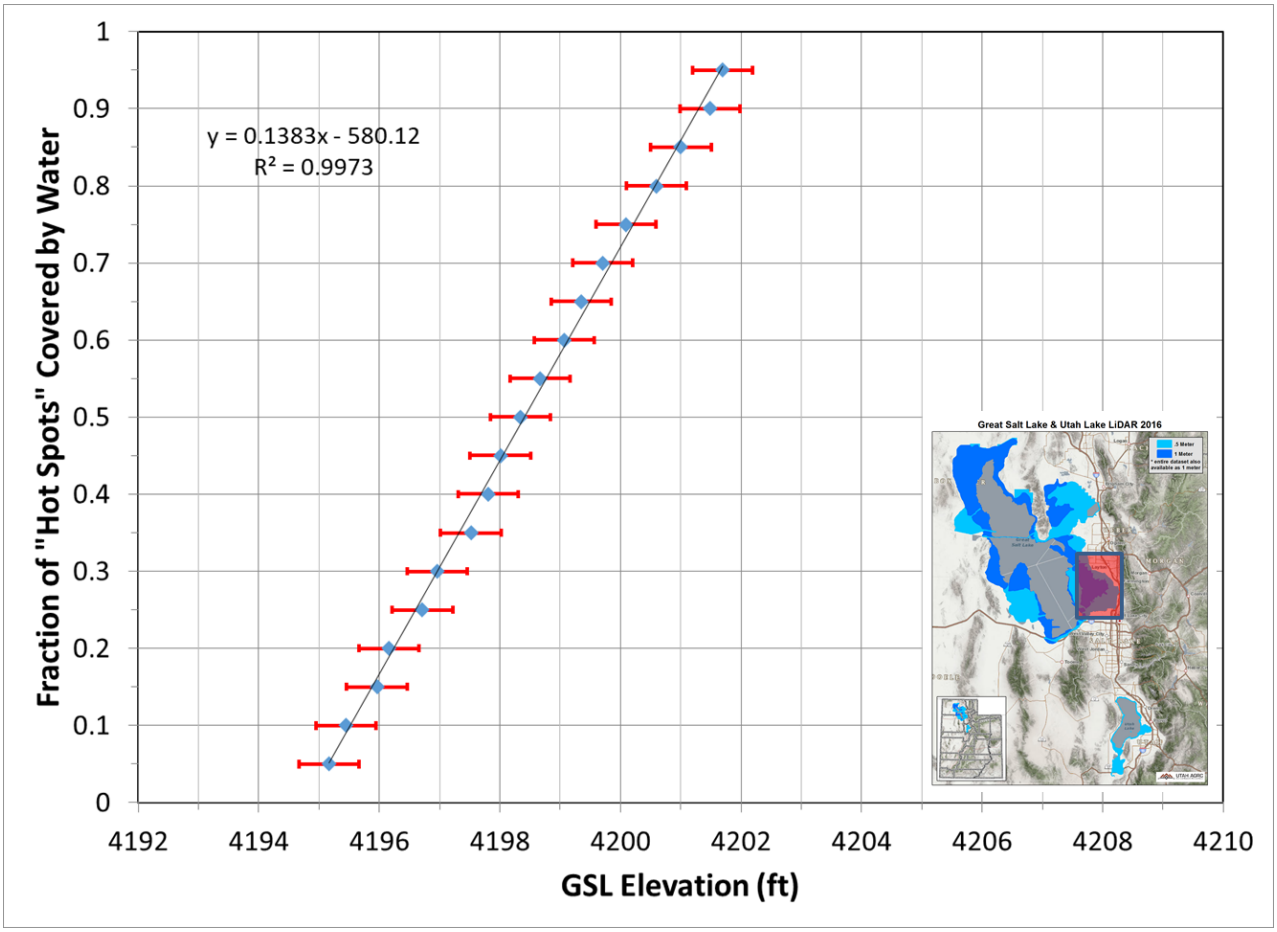

Figure 5.6 The fraction of dust "hot spots" located in Farmington Bay covered by water as a function of GSL elevation. The uncertainty of the GSL elevation measurements is indicated by the red error bars.

The results of the DEM analysis for Bear River Bay are shown in Figure 5.7. This figure shows that 30% of the dust "hot spots" will be covered by water when the GSL elevation is 4203 ft and that 90% of the dust "hot spots" will be covered by water when the GSL elevation is 4206.8 ft. The distribution shown in Figure 5.7 is linear with a Pearson correlation coefficient (R^2) of 0.9657. The slope of 0.1284 indicates that a 1-foot increase in the lake elevation will decrease the number of dust "hot spots" by 12.8% over the range of GSL elevations from 4199.5 ft through 4207 ft. Although it is tempting to extrapolate the linear trend beyond the range of the data, it is not advisable. For example, the highest elevation of a dust "hot spot" in Bear River Bay was 4209.4 ft which indicates that the trend does not continue beyond the 0.95 fractional coverage. In addition, nearly the entire area of Bear River Bay is dry when the GSL elevation drops below 4194 ft. As a result, further reductions in lake elevation beyond this threshold level will not expose much more surface area within Bear River Bay.

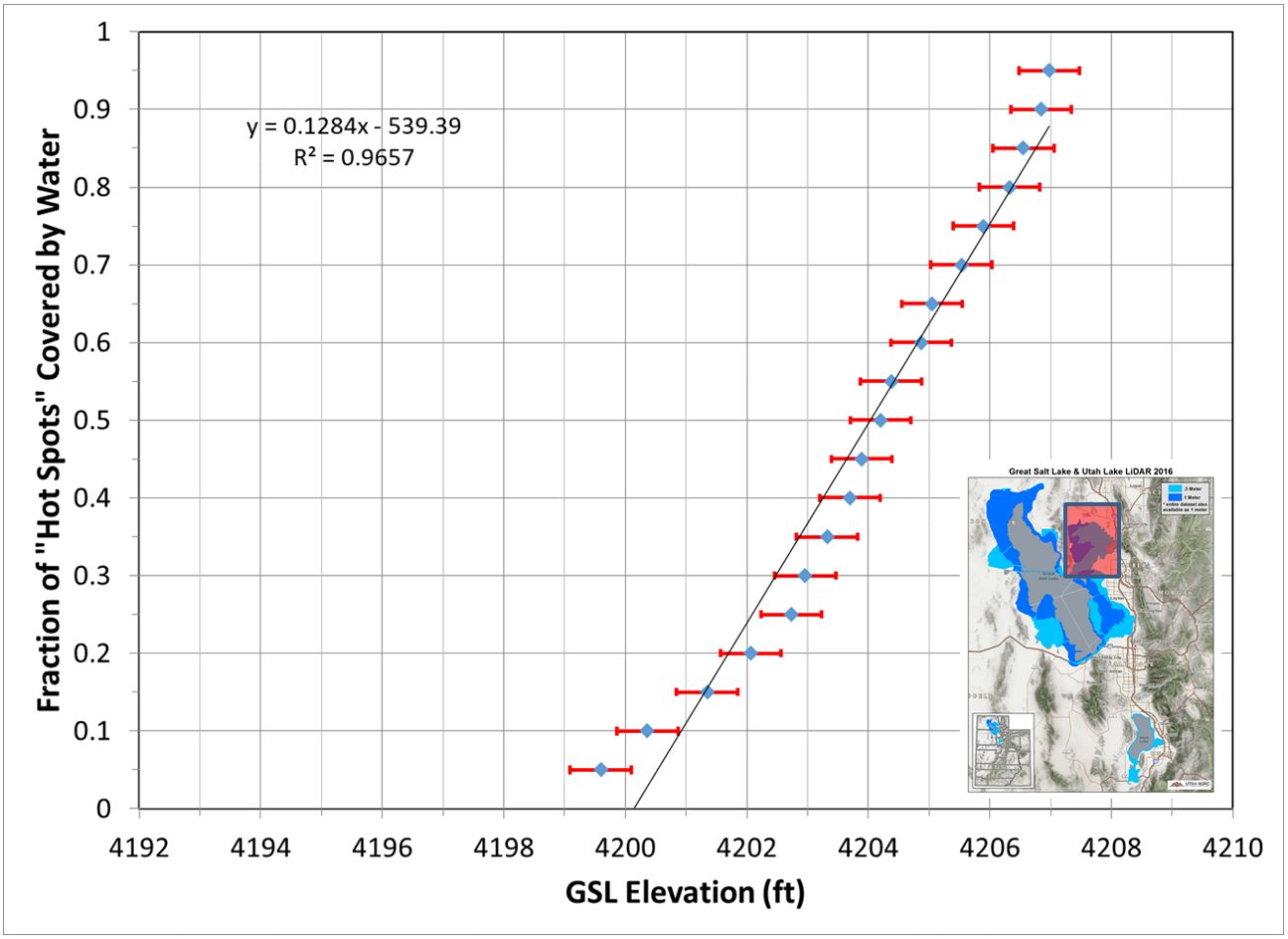

Figure 5.7 The fraction of dust "hot spots" located in Bear River Bay covered by water as a function of GSL elevation. The uncertainty of the GSL elevation measurements is indicated by the red error bars.

The results of the DEM analysis for Gilbert Bay are shown in Figure 5.8. This figure shows that 30% of the dust "hot spots" will be covered by water when the GSL elevation is 4198.9 ft and that 90% of the dust "hot spots" will be covered by water when the GSL elevation is 4203.6 ft. The distribution shown in Figure 5.8 is linear with a Pearson correlation coefficient (R^2) of 0.9822. The slope of 0.1167 indicates that a 1-foot increase in the lake elevation will decrease the number of dust "hot spots" by 11.7% over the range of GSL elevations from 4196 ft through 4204 ft. Although it is tempting to extrapolate the linear trend beyond the range of the data, it is not advisable. For example, the highest elevation of a dust "hot spot" in Gilbert Bay was 4214.4 ft which indicates that the trend does not continue beyond the 0.90 fractional coverage. In addition, the linear trend starts to break down at the 0.95 fractional coverage. However, unlike Farmington Bay and Bear River Bay, further reductions in the GSL elevation below 4194 ft are likely to follow the same linear trend with regards to the number of dust "hot spots" exposed. The reason for this is that Gilbert Bay still has significant surface area of lakebed to expose if the lake level were to continue dropping.

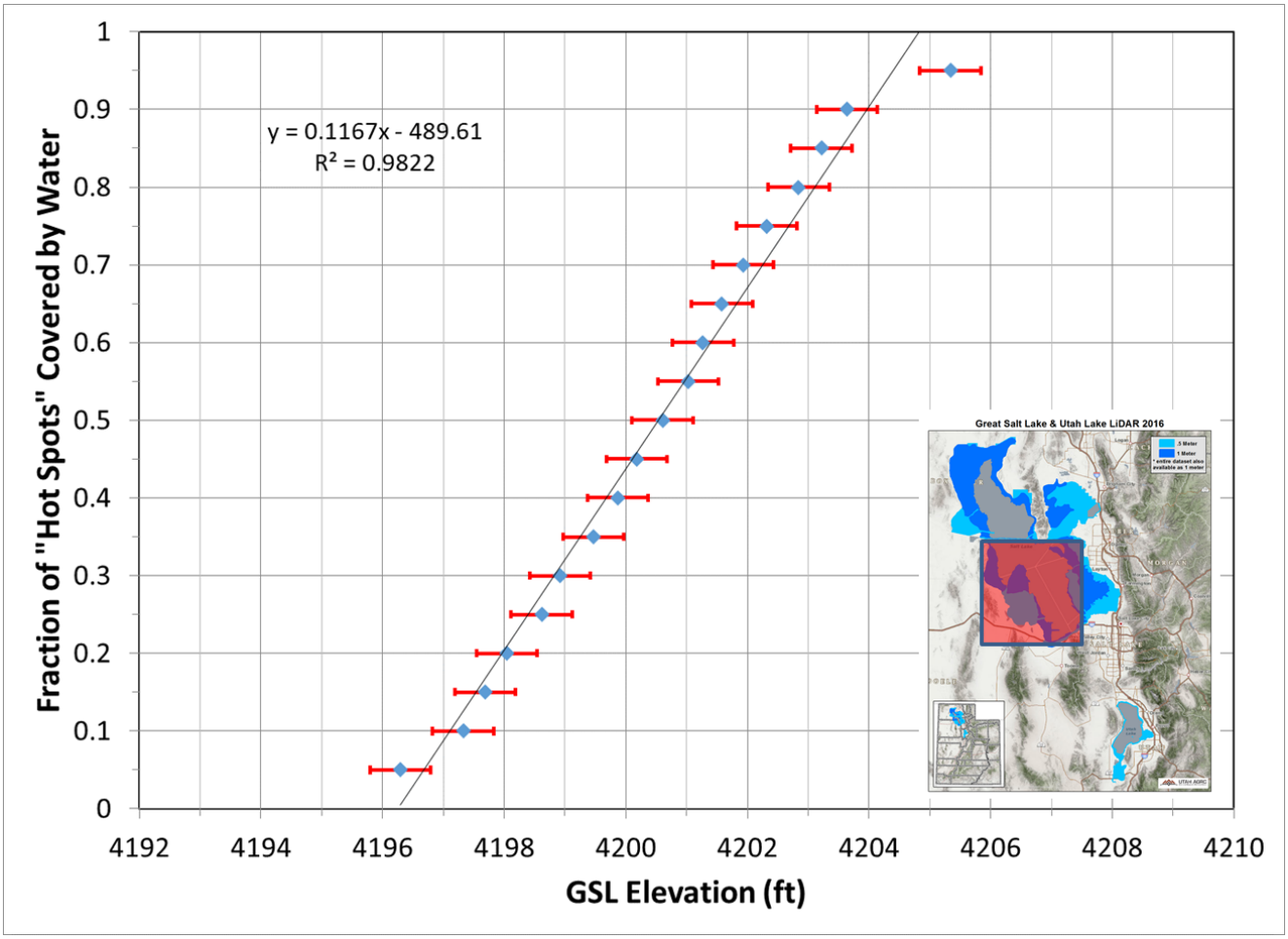

Figure 5.8 The fraction of dust "hot spots" located in Gilbert Bay covered by water as a function of GSL elevation. The uncertainty of the GSL elevation measurements is indicated by the red error bars.

The results of the DEM analysis for Gunnison Bay are shown in Figure 5.9. This figure shows that 30% of the dust "hot spots" will be covered by water when the GSL elevation is 4198.7 ft and that 90% of the dust "hot spots" will be covered by water when the GSL elevation is 4206.9 ft. The distribution shown in Figure 5.9 is linear with a Pearson correlation coefficient (R^2) of 0.9782. The slope of 0.0726 indicates that a 1-foot increase in the lake elevation will decrease the number of dust "hot spots" by 7.3% over the range of GSL elevations from 4196.5 ft through 4208 ft. Although it is tempting to extrapolate the linear trend beyond the range of the data, it is not advisable. For example, the highest elevation of a dust "hot spot" in Gunnison Bay was 4211.8 ft which indicates that the trend does not continue beyond the 0.95 fractional coverage. In addition, the high salt content of the Gunnison Bay has created a thick layer of salt on the bottom of this area of the lake. As the lake level declines below ~4197 ft it exposes this thick layer of salt which is unlikely to produce significant quantities of dust.

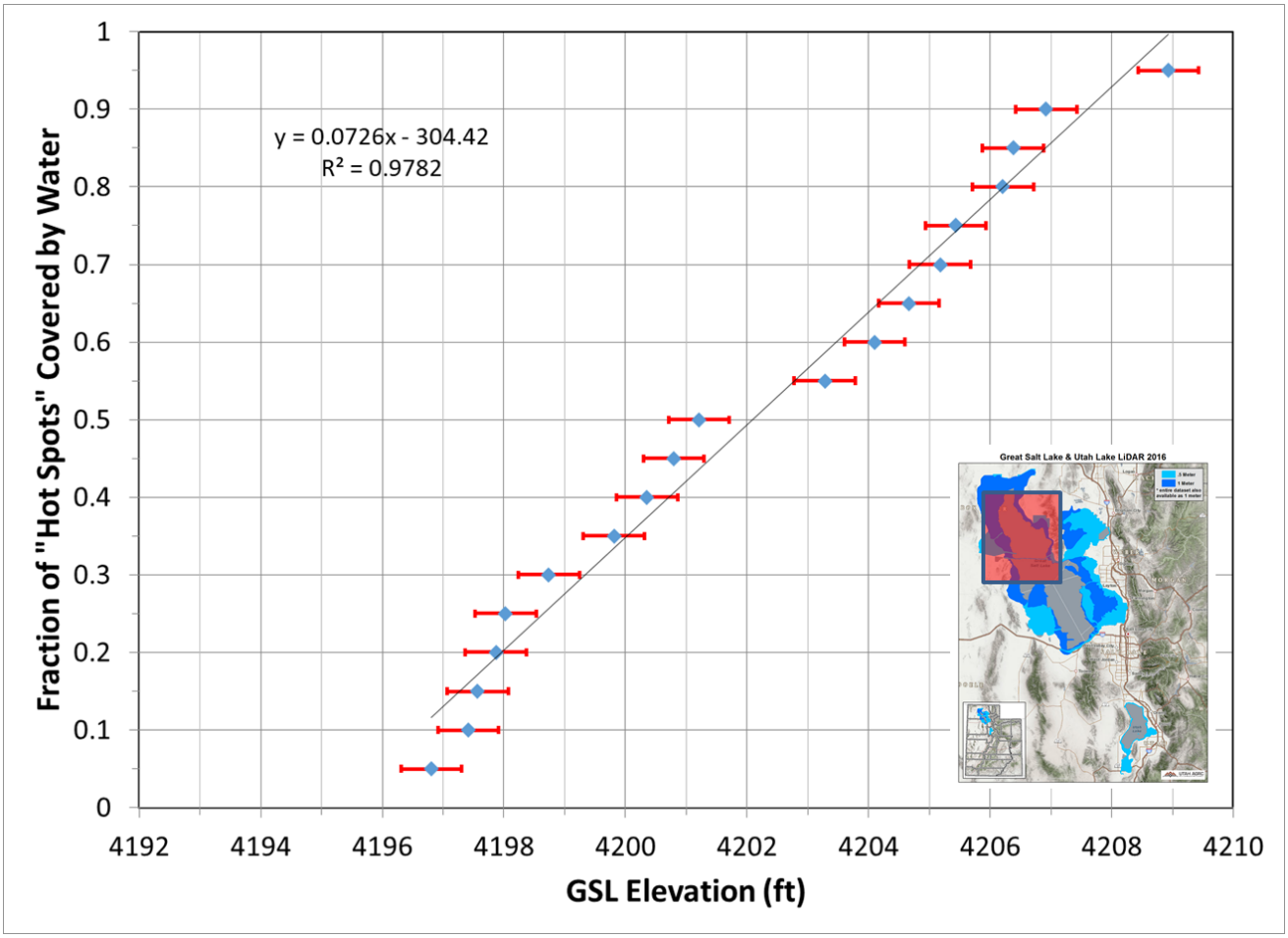

Figure 5.9 The fraction of dust "hot spots" located in Gunnison Bay covered by water as a function of GSL elevation. The uncertainty of the GSL elevation measurements is indicated by the red error bars.

5.5 Key Findings/Uncertainties

Key findings

- The number of dust "hot spots" varies linearly with lake elevation as shown in Table 5.2.

Table 5.2 Summary of GSL Elevation Impact on Dust Mitigation.

Quadrant	50% Mitigation Lake Level (feet)	80% Mitigation Lake Level (feet)	Slope (%/foot)
Farmington Bay	4198.3	4200.6	13.8
Bear River Bay	4204.2	4206.3	12.8
Gilbert Bay	4200.6	4202.8	11.7
Gunnison Bay	4201.2	4206.2	7.3

- Farmington Bay is the easiest area to mitigate because it requires the lowest lake elevation to cover the dust "hot spots".

- Bear River Bay is the most difficult area to mitigate because the dust "hot spots" generally occur at higher elevations than the other quadrants.

- The number of dust "hot spots" is unlikely to increase in Farmington Bay, Bear River Bay, and Gunnison Bay if the lake level decreases below 4194 ft because two of these areas (i.e., Farmington Bay and Bear River Bay) already have very little water coverage and the other (i.e., Gunnison Bay) is protected by a thick salt crust.

- The number of dust "hot spots" is likely to increase at a rate of 11.7% per foot in Gilbert Bay if the lake elevation continues to drop.

Uncertainties

- This study assumes that all dust "hot spots" produce equal amounts of dust under appropriate meteorological conditions. Further research is required to determine whether the number of dust "hot spots" is a good proxy for total dust production.

- A large calibration adjustment of -3.5 ft was applied to the LiDAR data to force agreement with the measured lake elevation and the bathymetric data. The source of the LiDAR data calibration discrepancy should be investigated.

- The number of dust "hot spots" may change over time due to natural erosion or manual disturbances.

6. Have Human Activities Altered the Chemical Composition of GSL Surface Soils?

6.1 Results

As a terminal basin lake, the GSL receives both naturally-occurring minerals and anthropogenic pollutants via its tributary streams and direct runoff. The sediment is also influenced by the wet and dry deposition of particulate matter transported from both local and regional sources. Although it is beyond the scope of this project to quantify the relative contribution of natural and anthropogenic sources to the observed PM_{10} elemental mass fractions, it is possible to use the spatial distributions of these elements (Appendix H) to infer the presence of significant localized sources.

Reviewing the maps contained in Appendix H reveals several broad groupings of elements with similar spatial distributions. More than half of the elements measured in the PM_{10} soil as part of this project had their peak mass fractions in Bear River Bay. Elements maximized in this region mainly consisted of the major soil elements (e.g., Si, Fe, Al, Ti, and K) as well as the rare earth metals. An example spatial distribution of the rare earth metals (lanthanum) is shown in Figure 6.1. It is unclear whether the Bear River is a more significant source of these rare earth metals or whether this pattern results from the soil being less salty in this region. Regions of the lakebed with a higher salt content could have an apparently lower concentration in both the major soil elements and the rare earth metals simply due to the displacement by evaporite minerals (i.e., salts). Further analysis of this issue is, therefore, warranted. Bear River Bay also has a high mass fraction of phosphorus (Fig. 6.2) which most likely originates from the runoff of fertilizers into the Bear River.

Farmington Bay is located at the mouth of the Jordan River and has the closest proximity to population centers along the Wasatch Front. As a result, it is one of the most likely regions to be impacted by human activities. Elements with distinctive mass fraction maxima in the Farmington Bay region include: antimony, cadmium, lead, selenium, thallium, uranium, zinc, and zirconium. The spatial distributions of cadmium, lead, and zinc are shown as examples in Figures 6.3 through 6.5. The spatial distribution maps for the remaining elements can be seen in Appendix H.

The southern shore of the GSL near Saltair is immediately adjacent to the Kennecott Utah Copper (KUC) tailings pile. This tailings pile covers ~15 square miles and rises to a height of ~250 feet above the surrounding terrain. Although KUC employs a wide variety of dust suppression techniques, dust plumes originating from the tailings pile are a common occurrence during high wind events. There is evidence that some of this fugitive dust is deposited onto the adjacent lakebed. For example, copper, molybdenum, and silver all have strong local maxima in the area just north of the tailings pile (Figures 6.6 through 6.8). These elements represent three of the primary metals extracted by KUC. Other elements with local maxima in this region include manganese, nickel, silicon, and sulfur (Appendix H).

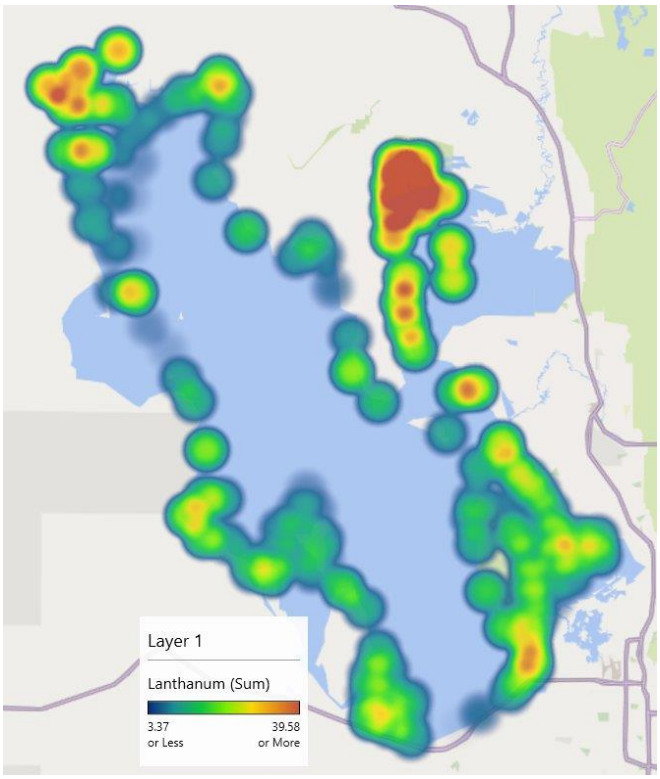

Figure 6.1 Map showing the spatial distribution of lanthanum (mg/kg) in the PM_{10} fraction of the soil.

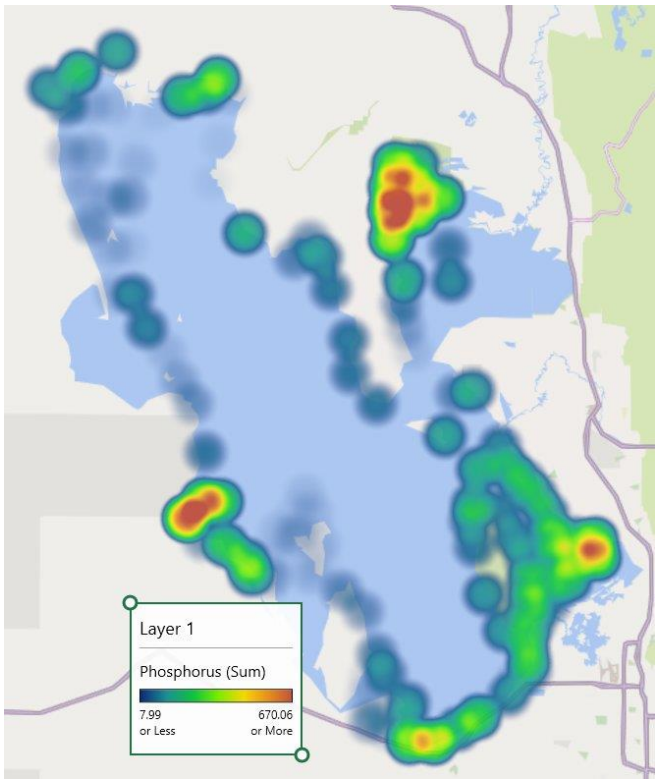

Figure 6.2 Map showing the spatial distribution of phosphorus (mg/kg) in the PM_{10} fraction of the soil.

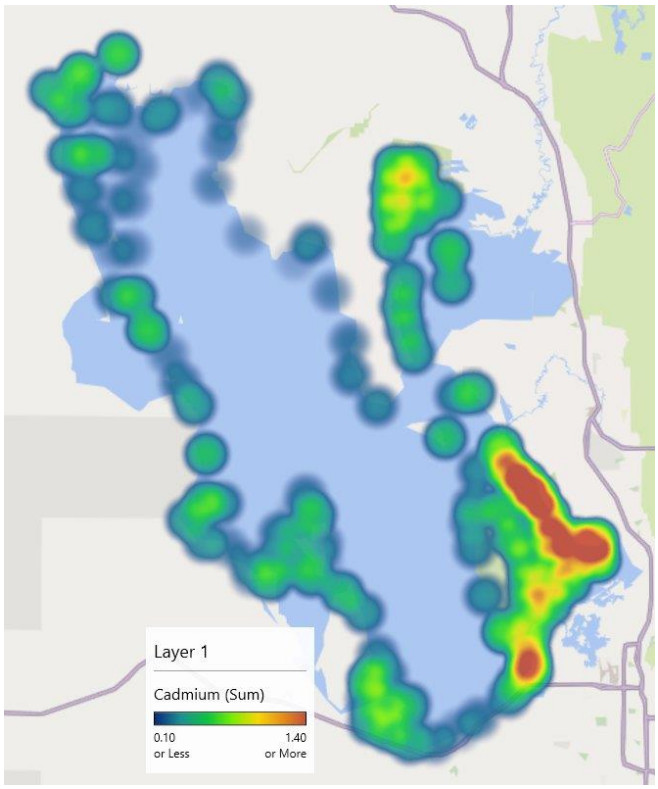

Figure 6.3 Map showing the spatial distribution of cadmium (mg/kg) in the PM_{10} fraction of the soil.

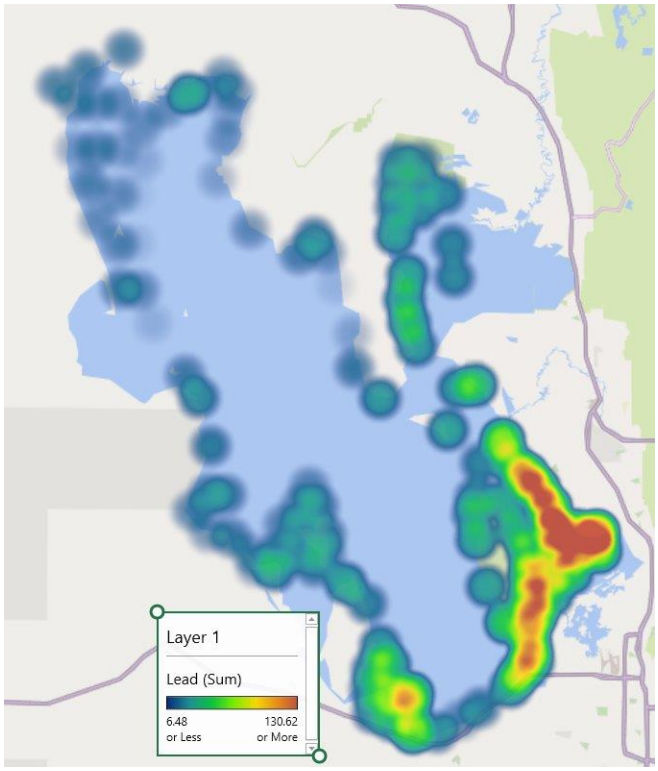

Figure 6.4 Map showing the spatial distribution of lead (mg/kg) in the PM_{10} fraction of the soil.

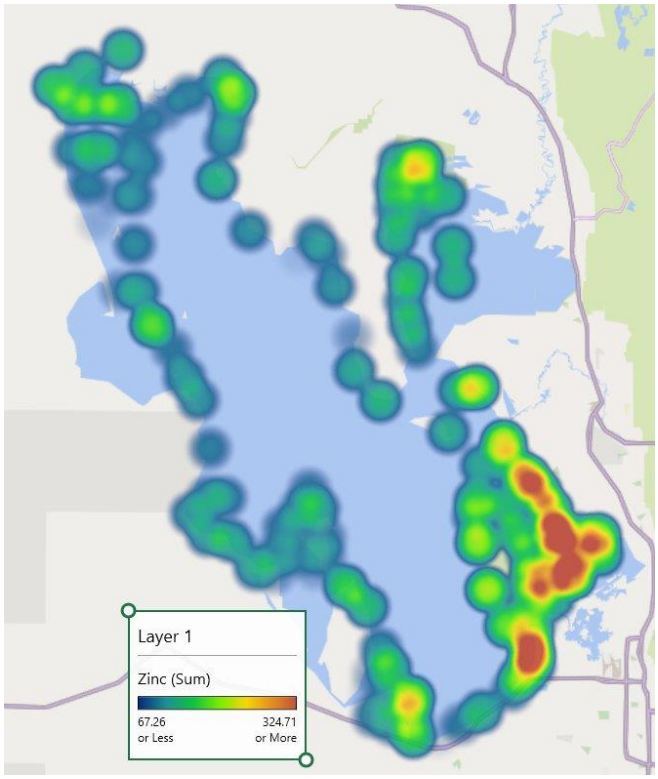

Figure 6.5 Map showing the spatial distribution of zinc (mg/kg) in the PM_{10} fraction of the soil.

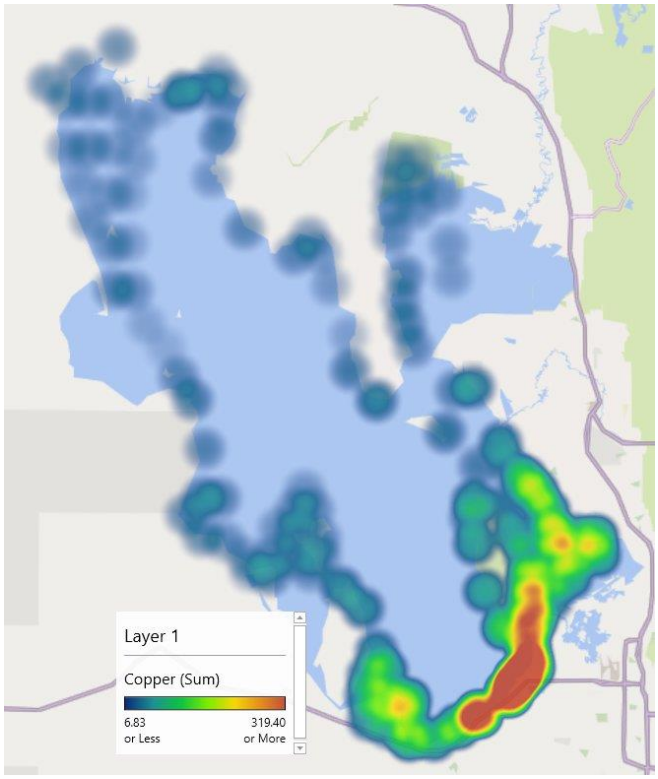

Figure 6.6 Map showing the spatial distribution of copper (mg/kg) in the PM_{10} fraction of the soil.

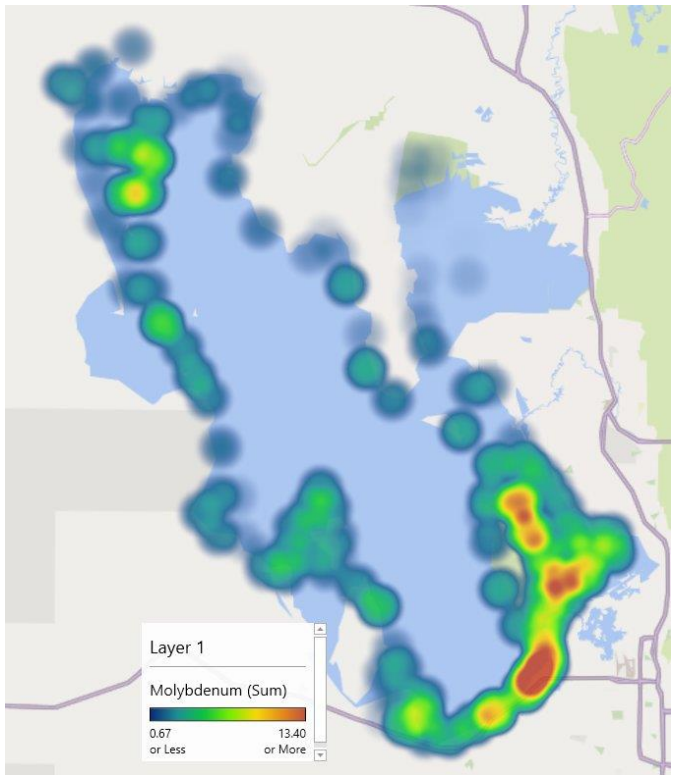

Figure 6.7 Map showing the spatial distribution of molybdenum (mg/kg) in the PM_{10} fraction of the soil.

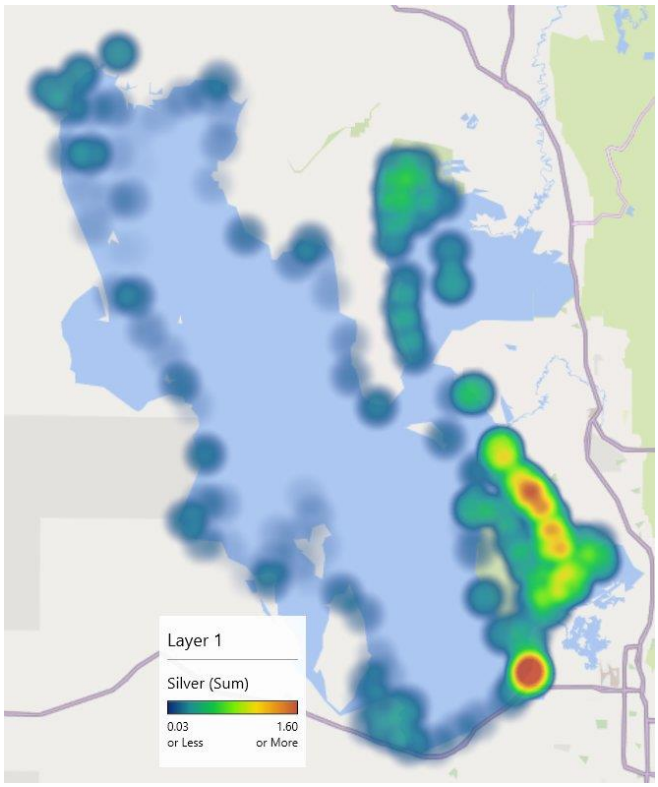

Figure 6.8 Map showing the spatial distribution of silver (mg/kg) in the PM_{10} fraction of the soil.

The coefficient of variation, which is defined as the standard deviation divided by the average concentration, is a statistical term used to describe how large the variations of an element are compared to the average. Table 6.1 shows that the elements with the largest coefficient of variation include copper, sulfur, silver, phosphorus, chlorine, molybdenum, zirconium, and lead. This type of analysis implies that these elements are most likely to have significant local sources which result in a non-uniform spatial distribution. As mentioned previously, copper, molybdenum and silver are enhanced immediately downwind of the KUC tailings pile. The same is true for sulfur (Appendix H). High phosphorus concentrations on the east side of the GSL are most likely associated with fertilizer runoff while high phosphorus concentrations near the Utah Test and Training Range (UTTR) on the west side most likely result from the use of tracer ammunition rounds at the adjacent live-fire range. Zirconium, which also peaks near the UTTR, is a commonly-used component of explosive primers. Thus, there is evidence that military exercises in the UTTR have had a measurable impact on the adjacent lakebed.

Table 6.1 Coefficient of Variation Data Ordered from the Greatest to the Least Variance.

Element	Avg. GSL PM_{10} Soil (mg/kg)	Standard Deviation (mg/kg)	Coefficient of Variation		Element	Avg. GSL PM_{10} Soil (mg/kg)	Standard Deviation (mg/kg)	Coefficient of Variation
Cu	64	92	1.43		Dy	1.8	1.0	0.54
S	15720	18281	1.16		Tb	0.3	0.16	0.54
Ag	0.22	0.22	1.02		Er	1	0.55	0.53
P	124	124	1.00		Yb	0.96	0.51	0.53
Cl	41764	36978	0.89		Ho	0.35	0.19	0.53
Mo	2.9	2.3	0.78		Be	0.84	0.44	0.52
Zr	4.4	3.3	0.75		Si	69299	35060	0.51
Pb	31	23	0.74		Eu	0.48	0.24	0.50
Lu	0.13	0.08	0.66		B	315	150	0.48
Na	24322	15797	0.65		Tl	0.29	0.13	0.47
Br	53	33	0.63		Cr	39	17	0.43
Cs	7.1	4.3	0.61		Ni	20	8.3	0.43
Sc	4.7	2.8	0.60		Sr	1681	690	0.41
Rb	77	45	0.59		V	38	15	0.40
Al	25508	14916	0.58		K	13480	5223	0.39
Ce	30	17	0.58		Mn	459	177	0.39
Ga	29	17	0.58		Li	145	57	0.39
Th	5.8	3.3	0.57		Sb	2.2	0.87	0.39
Pr	3.4	2.0	0.57		Zn	133	49	0.37
Cd	0.42	0.24	0.57		As	37	13.7	0.37
Ti	1351	760	0.56		Se	0.65	0.23	0.36
La	15	8.5	0.56		Co	5.4	1.94	0.36
Nd	13	7.2	0.56		Ca	165099	49993	0.3
Sm	2.4	1.4	0.56		U	5.8	1.6	0.28
Fe	13294	7259	0.55		Mg	59616	15821	0.27
Gd	2.1	1.1	0.55		Ba	409	104	0.25
Y	11	5.8	0.54					

Table 6.1 also shows that the ten most uniformly-distributed elements (i.e., those with the lowest coefficient of variation) include barium, magnesium, uranium, calcium, cobalt, selenium, arsenic, zinc, antimony, and lithium. Recall that two of these elements, arsenic and lithium, had average concentrations which exceeded both the residential and industrial RSLs established by the EPA. The low spatial variation of these elements increases the likelihood that the high concentrations of both arsenic and lithium result from natural, rather than anthropogenic, sources.

6.2 Key Findings/Uncertainties

Key findings

- The elements with the greatest spatial variability include copper, sulfur, silver, phosphorus, chlorine, molybdenum, zirconium, and lead. The high degree of spatial heterogeneity most likely results from anthropogenic sources.

- The area directly north of the KUC tailings pile has high concentrations of copper, silver, molybdenum, sulfur, manganese, nickel, and silicon. The elevated concentrations of these species most likely result from the dry deposition of dust plumes originating from the tailings pile.

- Elevated phosphorus concentrations in Bear River and Farmington Bays most likely result from fertilizer runoff.

- Activities at the UTTR military live-fire range on the western side of the GSL have elevated both the phosphorus and zirconium concentrations in the adjacent lakebed.

- The elements with the most uniform concentrations include barium, magnesium, uranium, calcium, cobalt, selenium, arsenic, zinc, antimony, and lithium

Uncertainties

- The analysis in this section is neither quantitative nor exhaustive. It is merely intended to qualitatively demonstrate that human activities have influenced the composition of the PM_{10} soil on the exposed portions of the GSL lakebed.

7. References

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Appendix A: Maps Showing the Locations of all the Sub Units

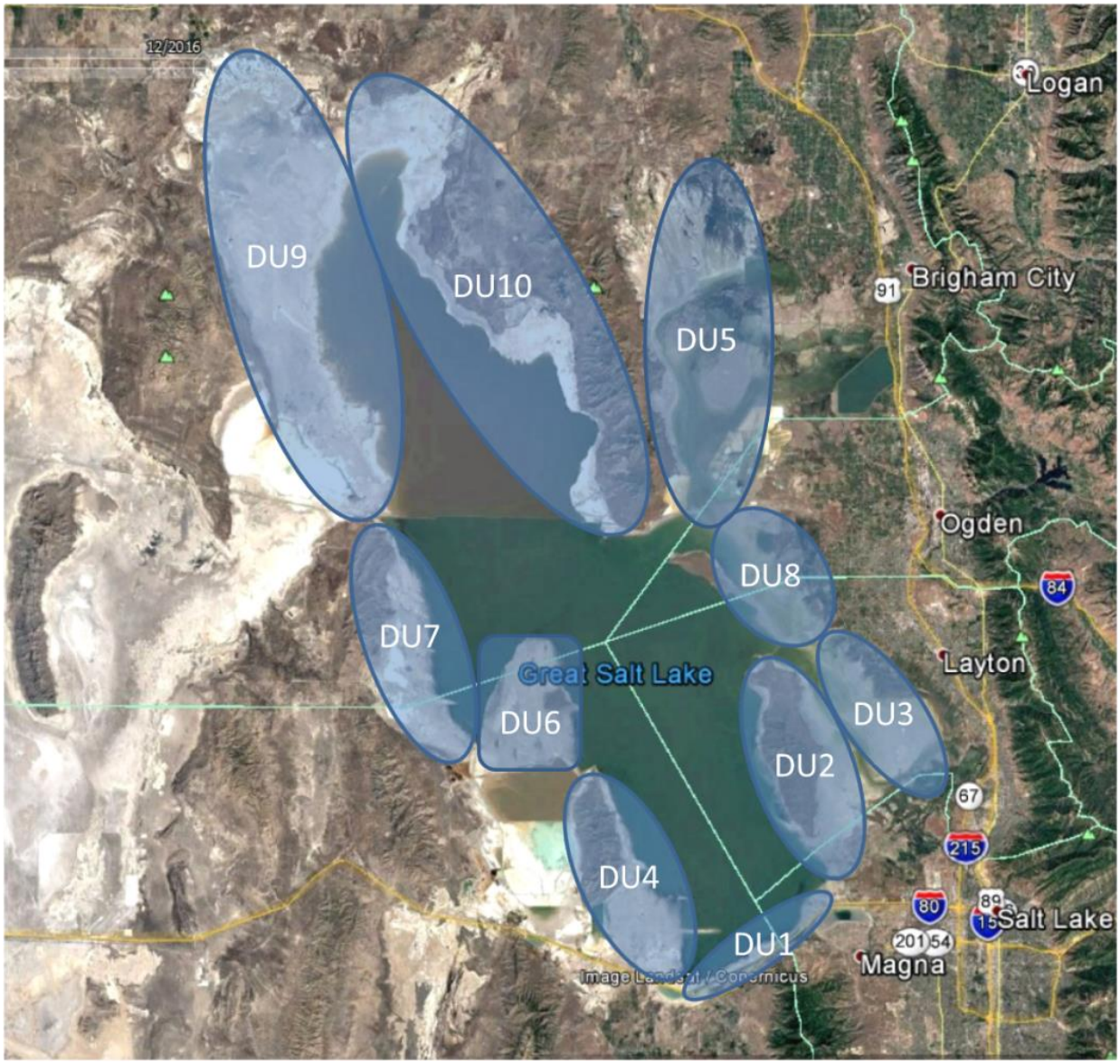


Figure A.1 Map showing how the Great Salt Lake was divided into 10 Decision Units (DUs) for this study.

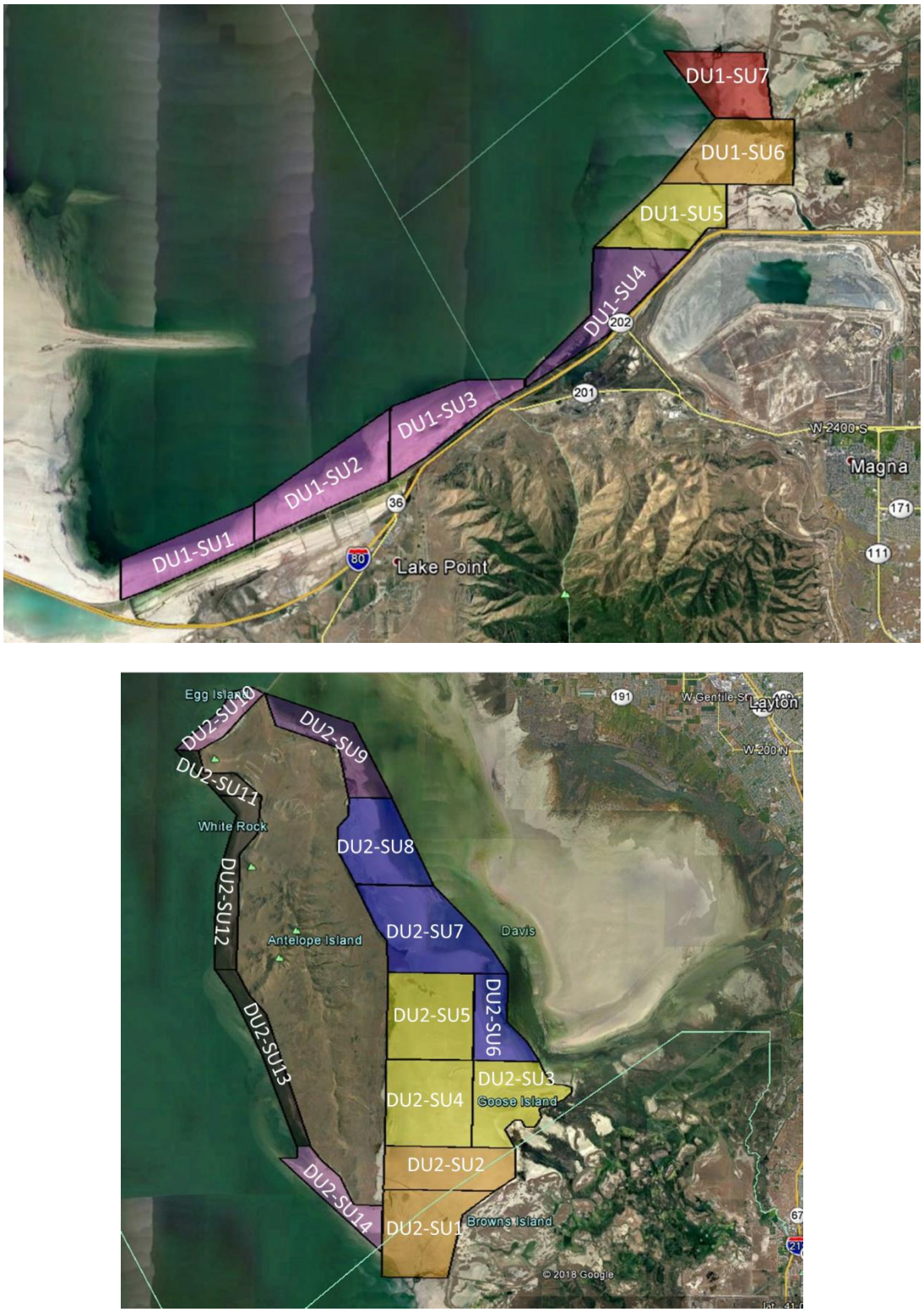
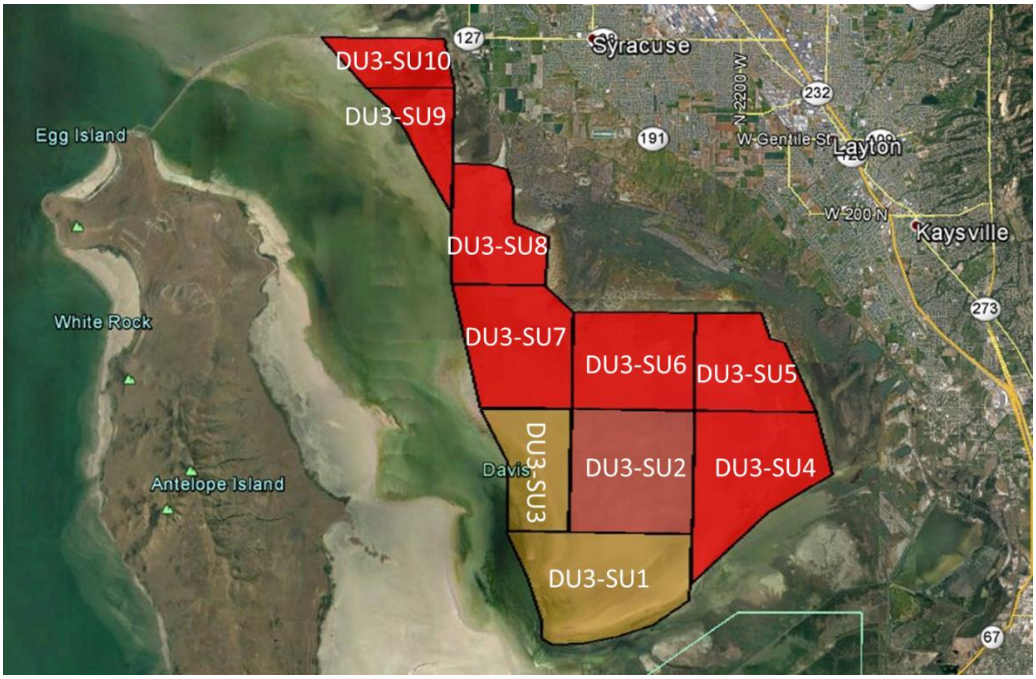


Figure A.2 Map showing the location of each SU in DU1 (top) and DU2 (bottom).



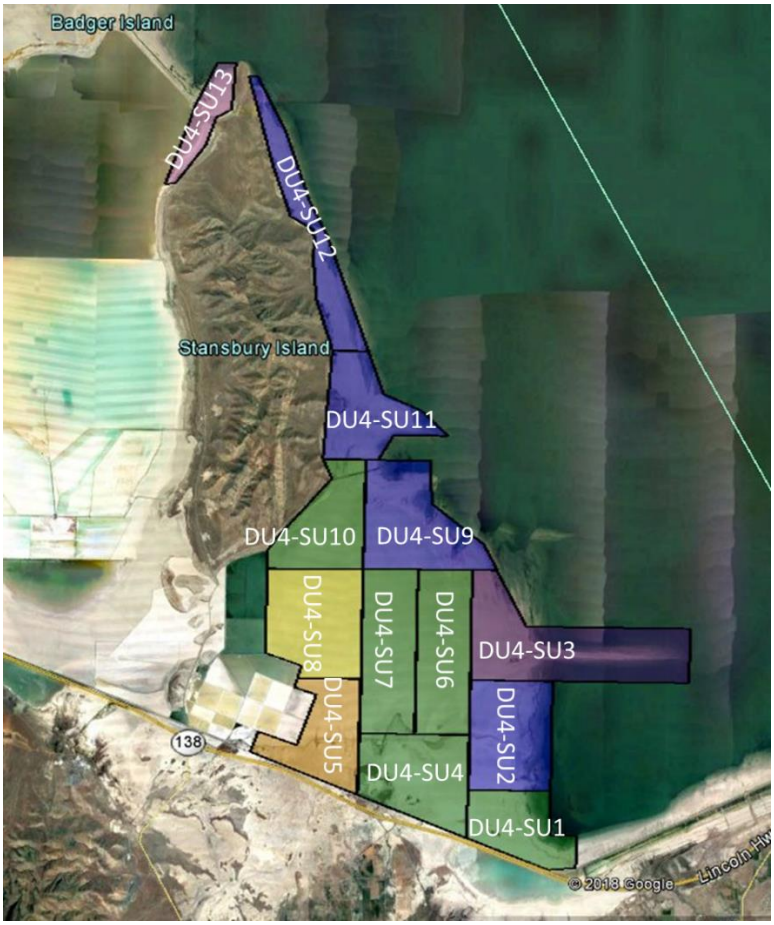


Figure A.3 Map showing the location of each SU in DU3 (top) and DU4 (bottom).

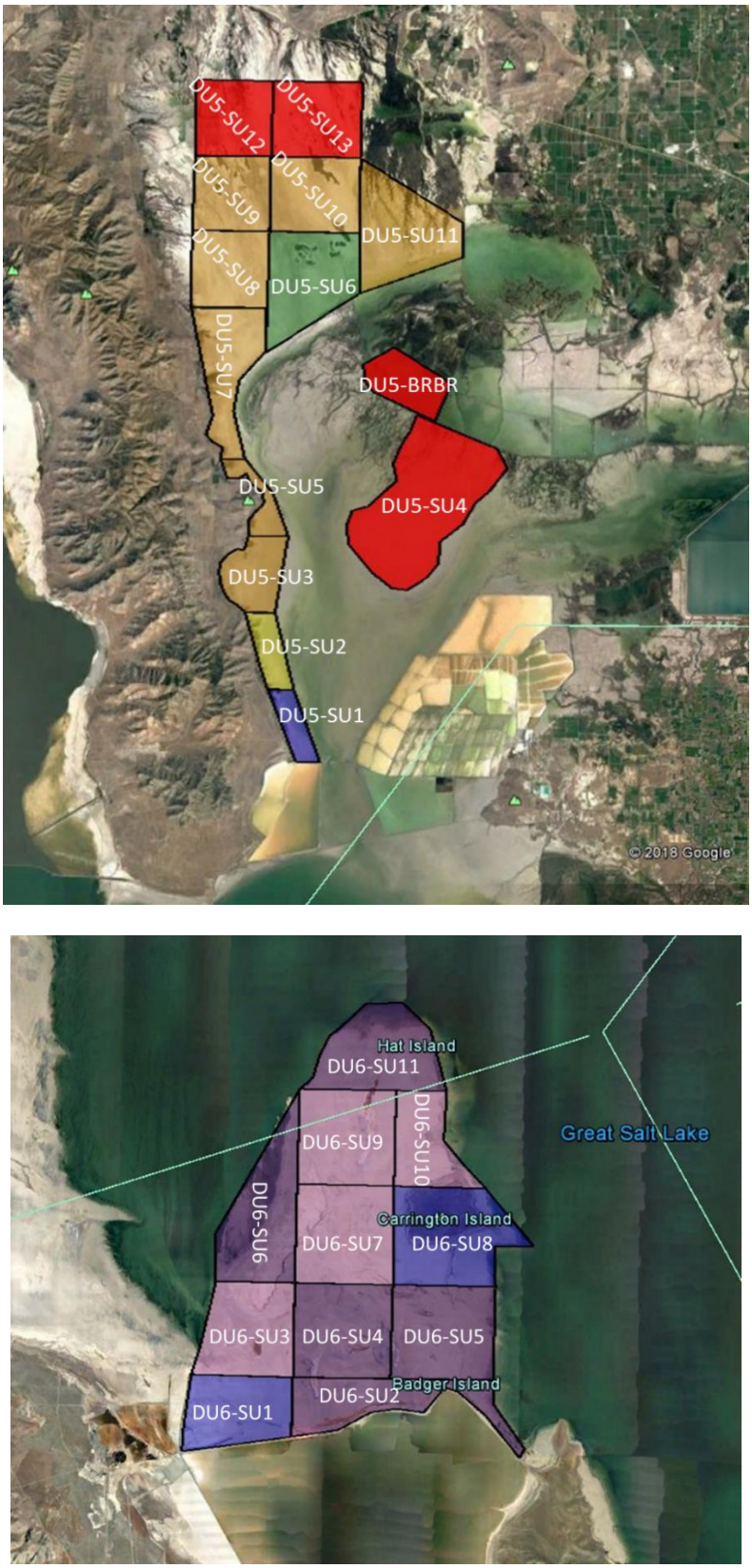
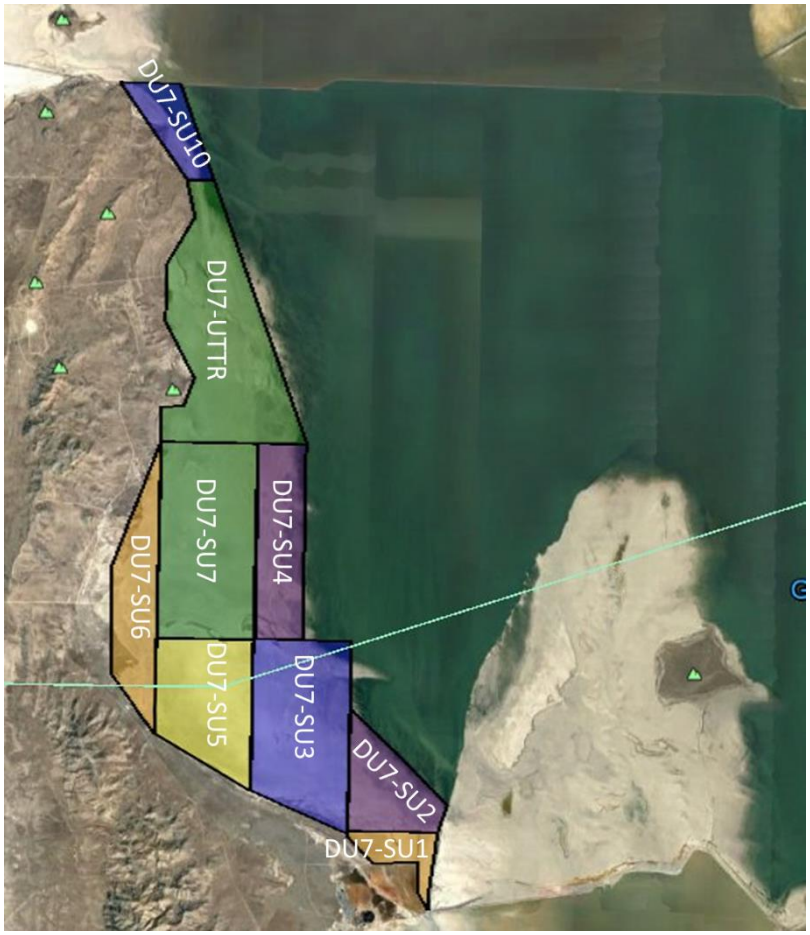


Figure A.4 Map showing the location of each SU in DU5 (top) and DU6 (bottom).



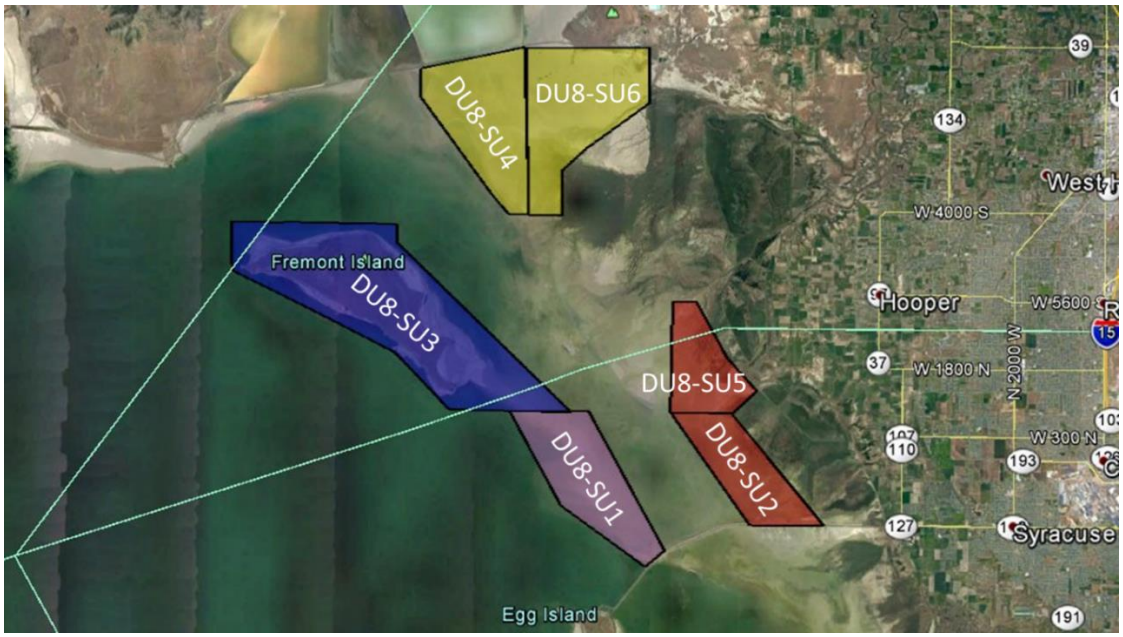


Figure A.5 Map showing the location of each SU in DU7 (top) and DU8 (bottom).

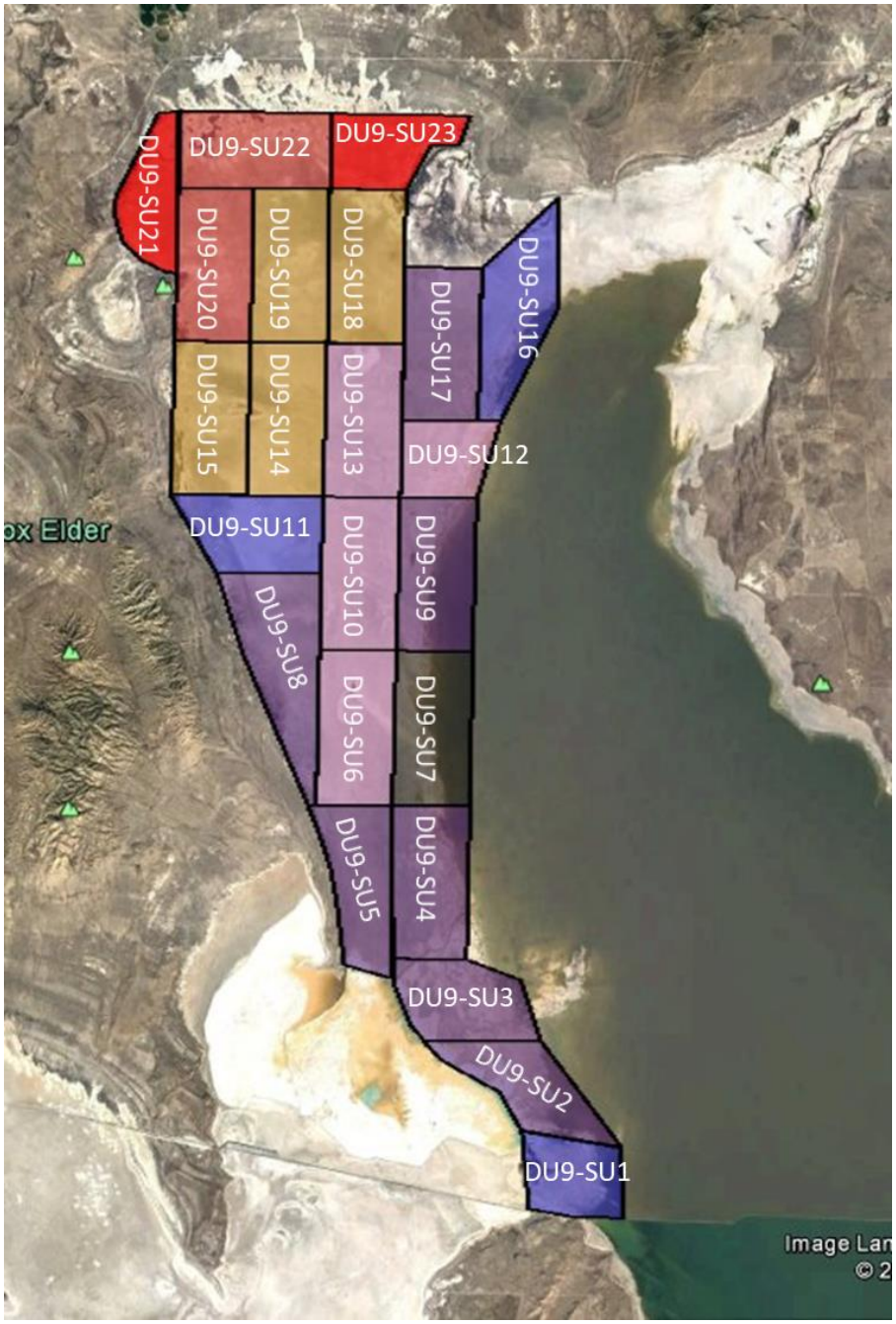


Figure A.6 Map showing the location of each SU in DU9.

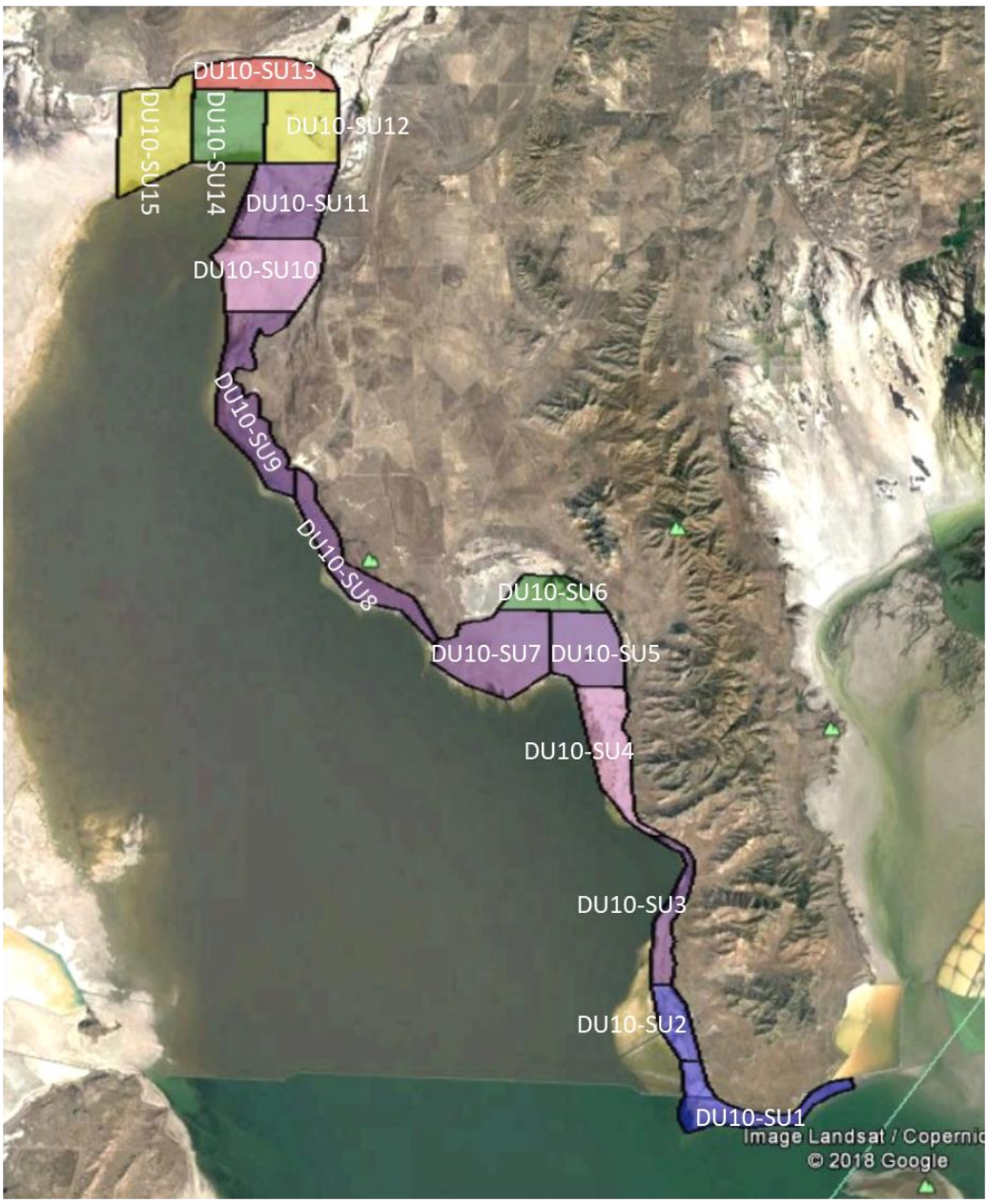


Figure A.7 Map showing the location of each SU in DU10.

Appendix B: Fine (Silt + Clay) Fractions for Each Sub Unit

Sample ID	Average Silt + Clay Percentage		Sample ID	Average Silt + Clay Percentage		Sample ID	Average Silt + Clay Percentage		Sample ID	Average Silt + Clay Percentage
DU1-SU1	1.4		DU4-SU1	4.2		DU6-SU1	3.1		DU9-SU1	3.2
DU1-SU2	1.1		DU4-SU2	3.0		DU6-SU2	2.4		DU9-SU2	2.5
DU1-SU3	1.2		DU4-SU3	2.1		DU6-SU3	1.7		DU9-SU3	2.7
DU1-SU4	2.7		DU4-SU4	4.4		DU6-SU4	2.7		DU9-SU4	2.3
DU1-SU5	5.1		DU4-SU5	6.4		DU6-SU5	2.3		DU9-SU5	2.5
DU1-SU6	6.7		DU4-SU6	4.2		DU6-SU6	2.5		DU9-SU6	1.7
DU1-SU7	9.7		DU4-SU7	4.2		DU6-SU7	1.9		DU9-SU7	0.7
			DU4-SU8	5.2		DU6-SU8	3.1		DU9-SU8	2.3
DU2-SU1	6.3		DU4-SU9	3.1		DU6-SU9	1.5		DU9-SU9	1.3
DU2-SU2	6.3		DU4-SU10	4.8		DU6-SU10	1.8		DU9-SU10	1.2
DU2-SU3	5.2		DU4-SU11	3.4		DU6-SU11	2.2		DU9-SU11	3.5
DU2-SU4	5.4		DU4-SU12	3.3					DU9-SU12	1.3
DU2-SU5	5.0		DU4-SU13	1.7		DU7-SU1	6.4		DU9-SU13	1.6
DU2-SU6	3.8					DU7-SU2	2.3		DU9-SU14	6.5
DU2-SU7	3.2		DU5-SU1	3.4		DU7-SU3	3.3		DU9-SU15	7.4
DU2-SU8	3.7		DU5-SU2	5.5		DU7-SU4	2.3		DU9-SU16	3.9
DU2-SU9	2.8		DU5-SU3	7.4		DU7-SU5	5.2		DU9-SU17	2.1
DU2-SU10	1.6		DU5-SU4	10.7		DU7-SU6	7.0		DU9-SU18	7.5
DU2-SU11	1.0		DU5-SU5	7.1		DU7-SU7	4.7		DU9-SU19	6.4
DU2-SU12	0.6		DU5-SU6	4.8		DU7-UTTR	4.2		DU9-SU20	9.1
DU2-SU13	0.8		DU5-SU7	7.0		DU7-SU10	3.7		DU9-SU21	10.9
DU2-SU14	1.4		DU5-SU8	7.3					DU9-SU22	8.1
			DU5-SU9	7.3		DU8-SU1	1.4		DU9-SU23	11.3
DU3-SU1	6.6		DU5-SU10	6.9		DU8-SU2	8.1			
DU3-SU2	8.1		DU5-SU11	6.3		DU8-SU3	3.2		DU10-SU1	3.0
DU3-SU3	6.1		DU5-SU12	13.8		DU8-SU4	5.1		DU10-SU2	3.4
DU3-SU4	13.3		DU5-SU13	11.3		DU8-SU5	9.0		DU10-SU3	2.3
DU3-SU5	12.9		DU5-BRBR	12.8		DU8-SU6	5.6		DU10-SU4	1.5
DU3-SU6	11.3								DU10-SU5	2.6
DU3-SU7	10.7								DU10-SU6	4.6
DU3-SU8	18.8								DU10-SU7	2.6
DU3-SU9	23.8								DU10-SU8	2.6
DU3-SU10	13.4								DU10-SU9	2.1
									DU10-SU10	1.7
									DU10-SU11	2.5
									DU10-SU12	5.4
									DU10-SU13	9.7
									DU10-SU14	3.6
									DU10-SU15	5.3

Appendix C: Surface Condition Observations of the GSL Playa

An electronic version of the data contained in this appendix is contained in GSL_Dust_Plumes_Final_Report_Appendix_C.xlsx

Figure C.1 Examples of areas of the GSL lakebed that are vegetated (V).

Figure C.2 Examples of areas of the GSL lakebed with some vegetation (SV).

Figure C.3 Examples of areas of the GSL lakebed with cobbles (COL).

Figure C.4 Examples of areas of the GSL lakebed with pebbles (COM).

Figure C.5 Examples of areas of the GSL lakebed with granules (COS).

Figure C.6 Examples of areas of the GSL lakebed with visible salt crystals (SA).

Figure C.7 Examples of areas of the GSL lakebed with black soil (B).

Figure C.8 Examples of areas of the GSL lakebed with sand dunes (SND).

Figure C.9 Examples of areas of the GSL lakebed with biomats (BM).

Figure C.10 Examples of areas of the GSL lakebed with eroding biomats (EBM).

Figure C.11 Examples of areas of the GSL lakebed with bioherms (BH).

Figure C.12 Examples of areas of the GSL lakebed with a halite crust (HAL).

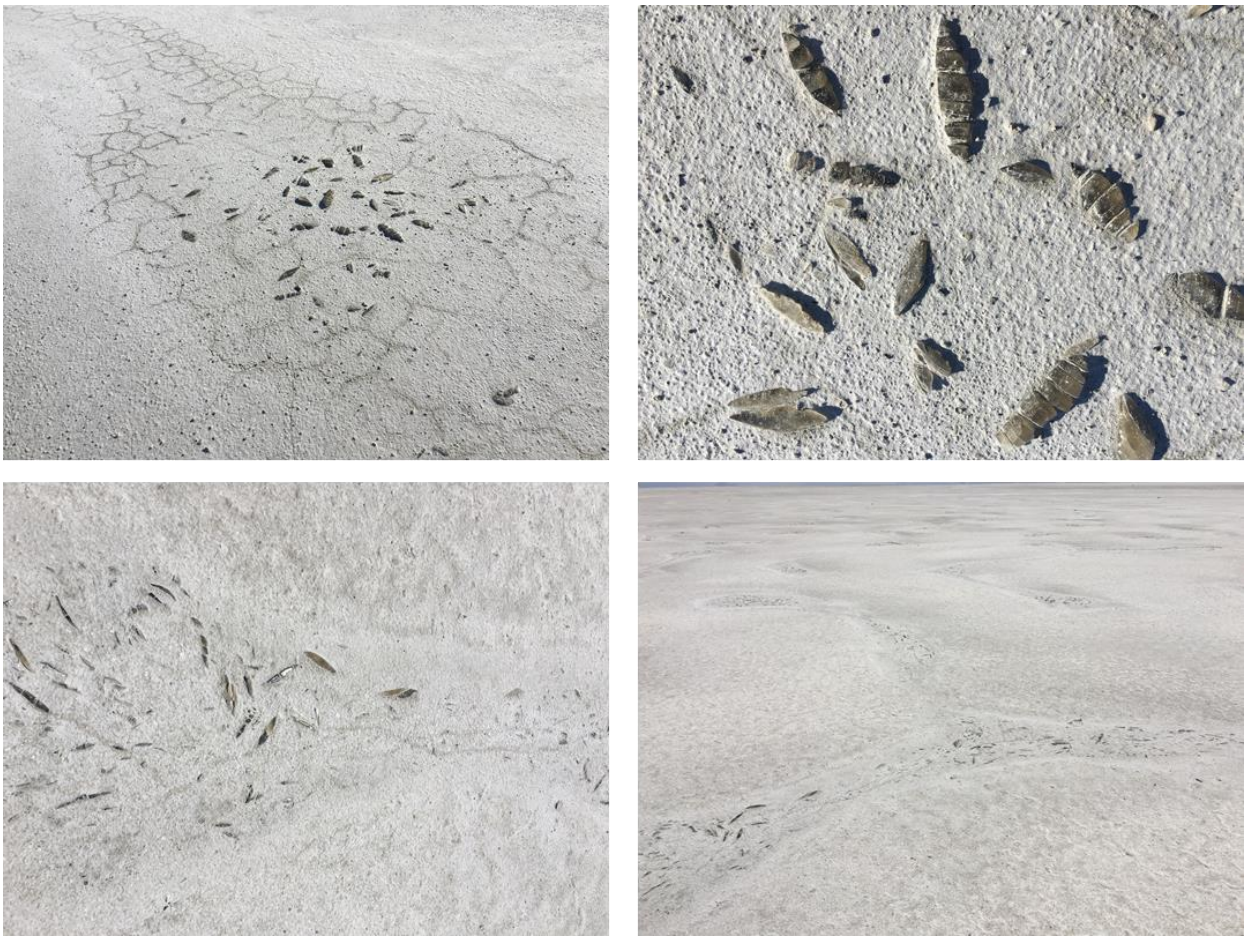


Figure C.13 Examples of areas of the GSL lakebed with gypsum (selenite) crystals (GYP).

Figure C.14 Examples of areas of the GSL lakebed with hexagonal (polygonal) features (HEX).

Figure C.15 Examples of areas of the GSL lakebed with circular features (CIR).

Figure C.16 Examples of areas of the GSL lakebed with moving rocks (MR).

Sample ID	Longitude	Latitude	Date	V	SV	NV	TC	MC	SC	NC	ETC	EMC	ESC	VF	COL	COM	COS	SA	B	SND	BM	EBM	BH	HAL	GYP	HEX	CIR	MR
DU1-SU1	-112.36007	40.67660	6/16/2016	X						X					X													
DU1-SU1	-112.36007	40.67435	6/16/2016		X				X						X													
DU1-SU1	-112.36007	40.67211	6/16/2016			X			X																			
DU1-SU1	-112.36007	40.66986	6/16/2016			X				X																		
DU1-SU1	-112.35710	40.67884	6/16/2016			X				X																		
DU1-SU1	-112.35710	40.67660	6/16/2016		X				X								X											
DU1-SU1	-112.35710	40.67435	6/16/2016			X			X																			
DU1-SU1	-112.35710	40.67211	6/16/2016			X				X									X									
DU1-SU1	-112.35414	40.67884	6/16/2016			X				X					X													
DU1-SU1	-112.35414	40.67660	6/16/2016			X			X						X													
DU1-SU1	-112.35414	40.67435	6/16/2016			X			X																			
DU1-SU1	-112.35414	40.67211	6/16/2016			X			X																			
DU1-SU1	-112.35117	40.67884	6/16/2016			X			X								X											
DU1-SU1	-112.35117	40.67660	6/16/2016			X			X																			
DU1-SU1	-112.35117	40.67435	6/16/2016			X			X																			
DU1-SU1	-112.34821	40.68109	6/16/2016			X				X																		
DU1-SU1	-112.34821	40.67884	6/16/2016			X			X								X											
DU1-SU1	-112.34821	40.67660	6/16/2016			X			X																			
DU1-SU1	-112.34821	40.67435	6/16/2016			X			X										X									
DU1-SU1	-112.34524	40.68109	6/16/2016			X				X																		
DU1-SU1	-112.34524	40.67884	6/16/2016			X			X																			
DU1-SU1	-112.34524	40.67660	6/16/2016			X			X								X											
DU1-SU1	-112.34228	40.68109	6/16/2016			X			X						X													
DU1-SU1	-112.34228	40.67884	6/16/2016			X			X									X										
DU1-SU1	-112.34228	40.67660	6/16/2016			X			X										X									
DU1-SU1	-112.33931	40.68109	6/16/2016			X			X								X											
DU1-SU1	-112.33931	40.67884	6/16/2016			X			X																			
DU1-SU1	-112.33635	40.68333	6/16/2016			X				X																		
DU1-SU1	-112.33635	40.68109	6/16/2016			X			X																			
DU1-SU1	-112.33635	40.67884	6/16/2016			X			X																			
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DU1-SU1	-112.33042	40.68333	6/16/2016			X			X						X													
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DU1-SU1	-112.32745	40.68333	6/16/2016			X			X																			
DU1-SU1	-112.32449	40.68558	6/16/2016			X				X																		
DU1-SU1	-112.32449	40.68333	6/16/2016			X			X																			
DU1-SU1	-112.32152	40.68782	6/16/2016			X				X																		
DU1-SU1	-112.32152	40.68558	6/16/2016			X			X								X											
DU1-SU1	-112.31856	40.69007	6/16/2016			X				X									X									
DU1-SU1	-112.31856	40.68782	6/16/2016			X			X								X											
DU1-SU1	-112.31856	40.68558	6/16/2016			X			X										X									
DU1-SU1	-112.31559	40.69231	6/16/2016			X				X									X									
DU1-SU1	-112.31559	40.69007	6/16/2016			X			X																			
DU1-SU1	-112.31559	40.68782	6/16/2016			X			X																			

Sample ID	Longitude	Latitude	Date	V	SV	NV	TC	MC	SC	NC	ETC	EMC	ESC	VF	COL	COM	COS	SA	B	SND	BM	EBM	BH	HAL	GYP	HEX	CIR	MR
DU1-SU2	-112.31268	40.69242	6/18/2016			X			X									X										
DU1-SU2	-112.31268	40.69018	6/18/2016			X			X						X													
DU1-SU2	-112.31268	40.68793	6/18/2016			X			X								X											
DU1-SU2	-112.30971	40.69467	6/18/2016			X			X						X													
DU1-SU2	-112.30971	40.69242	6/18/2016			X			X						X													
DU1-SU2	-112.30971	40.69018	6/18/2016		X				X							X												
DU1-SU2	-112.30971	40.68793	6/18/2016	X																								
DU1-SU2	-112.30675	40.69467	6/18/2016			X			X																			
DU1-SU2	-112.30675	40.69242	6/18/2016			X			X							X												
DU1-SU2	-112.30675	40.69018	6/18/2016		X				X								X											
DU1-SU2	-112.30378	40.69691	6/18/2016			X			X										X									
DU1-SU2	-112.30378	40.69467	6/18/2016			X			X										X									
DU1-SU2	-112.30378	40.69242	6/18/2016		X				X																			
DU1-SU2	-112.30378	40.69018	6/18/2016	X																								
DU1-SU2	-112.30082	40.69691	6/18/2016			X				X																		
DU1-SU2	-112.30082	40.69467	6/18/2016			X		X																				
DU1-SU2	-112.30082	40.69242	6/18/2016		X								X															
DU1-SU2	-112.29785	40.69916	6/18/2016			X			X										X									
DU1-SU2	-112.29785	40.69691	6/18/2016			X			X																			
DU1-SU2	-112.29785	40.69467	6/18/2016		X				X																			
DU1-SU2	-112.29785	40.69242	6/18/2016			X				X																		
DU1-SU2	-112.29489	40.70140	6/18/2016			X				X									X									
DU1-SU2	-112.29489	40.69916	6/18/2016			X			X						X													
DU1-SU2	-112.29489	40.69691	6/18/2016	X																								
DU1-SU2	-112.29489	40.69467	6/18/2016			X			X						X													
DU1-SU2	-112.29192	40.70140	6/18/2016			X				X									X									
DU1-SU2	-112.29192	40.69916	6/18/2016			X			X																			
DU1-SU2	-112.29192	40.69691	6/18/2016		X			X																				
DU1-SU2	-112.29192	40.69467	6/18/2016			X				X									X									
DU1-SU2	-112.28896	40.70365	6/18/2016			X				X																		
DU1-SU2	-112.28896	40.69916	6/18/2016			X			X																			
DU1-SU2	-112.28896	40.69691	6/18/2016		X					X				X														
DU1-SU2	-112.28896	40.69467	6/18/2016		X				X																			
DU1-SU2	-112.28599	40.70365	6/18/2016			X				X								X										
DU1-SU2	-112.28599	40.70140	6/18/2016			X			X																			
DU1-SU2	-112.28599	40.69916	6/18/2016		X					X				X														
DU1-SU2	-112.28599	40.69691	6/18/2016			X			X										X									
DU1-SU2	-112.28303	40.70589	6/18/2016			X				X																		
DU1-SU2	-112.28303	40.70365	6/18/2016			X			X																			
DU1-SU2	-112.28303	40.70140	6/18/2016			X			X																			
DU1-SU2	-112.28303	40.69916	6/18/2016			X			X									X										
DU1-SU2	-112.28006	40.70589	6/18/2016			X				X																		
DU1-SU2	-112.28006	40.70365	6/18/2016			X			X								X											
DU1-SU2	-112.28006	40.70140	6/18/2016		X				X							X												
DU1-SU2	-112.28006	40.69916	6/18/2016			X			X									X	X									
DU1-SU2	-112.27710	40.70589	6/18/2016			X				X									X									
DU1-SU2	-112.27710	40.70365	6/18/2016			X			X								X											
DU1-SU2	-112.27710	40.70140	6/18/2016			X			X																			
DU1-SU2	-112.27413	40.70589	6/18/2016			X	X												X									
DU1-SU2	-112.27413	40.70365	6/18/2016		X				X						X													
DU1-SU2	-112.27413	40.70140	6/18/2016			X			X																			
DU1-SU2	-112.27117	40.71263	6/18/2016			X			X																			
DU1-SU2	-112.27117	40.71038	6/18/2016			X			X																			
DU1-SU2	-112.27117	40.70814	6/18/2016			X			X										X									
DU1-SU2	-112.27117	40.70589	6/18/2016		X				X								X											
DU1-SU2	-112.27117	40.70365	6/18/2016		X					X				X		X												
DU1-SU2	-112.27117	40.70140	6/18/2016		X				X									X										
DU1-SU2	-112.26820	40.71263	6/18/2016			X			X																			
DU1-SU2	-112.26820	40.71038	6/18/2016			X			X																			
DU1-SU2	-112.26820	40.70814	6/18/2016			X			X																			
DU1-SU2	-112.26820	40.70589	6/18/2016		X					X				X														
DU1-SU2	-112.26820	40.70365	6/18/2016		X					X				X														

Sample ID	Longitude	Latitude	Date	V	SV	NV	TC	MC	SC	NC	ETC	EMC	ESC	VF	COL	COM	COS	SA	B	SND	BM	EBM	BH	HAL	GYP	HEX	CIR	MR
DU1-SU3	-112.26526	40.71712	6/19/2016			X			X																			
DU1-SU3	-112.26526	40.71487	6/19/2016			X			X							X												
DU1-SU3	-112.26526	40.71263	6/19/2016			X			X								X											
DU1-SU3	-112.26526	40.71038	6/19/2016			X			X																			
DU1-SU3	-112.26526	40.70813	6/19/2016			X			X								X											
DU1-SU3	-112.26526	40.70589	6/19/2016			X			X								X											
DU1-SU3	-112.26526	40.70364	6/19/2016			X			X										X									
DU1-SU3	-112.26229	40.71936	6/19/2016			X				X																		
DU1-SU3	-112.26229	40.71712	6/19/2016			X			X								X											
DU1-SU3	-112.26229	40.71487	6/19/2016			X			X							X												
DU1-SU3	-112.26229	40.71263	6/19/2016			X			X								X											
DU1-SU3	-112.26229	40.71038	6/19/2016			X			X								X											
DU1-SU3	-112.26229	40.70813	6/19/2016			X			X								X											
DU1-SU3	-112.26229	40.70589	6/19/2016		X				X																			
DU1-SU3	-112.25933	40.71936	6/19/2016			X			X																			
DU1-SU3	-112.25933	40.71712	6/19/2016			X			X								X											
DU1-SU3	-112.25933	40.71487	6/19/2016			X			X								X											
DU1-SU3	-112.25933	40.71263	6/19/2016			X			X								X											
DU1-SU3	-112.25933	40.71038	6/19/2016			X			X																			
DU1-SU3	-112.25933	40.70813	6/19/2016		X					X				X														
DU1-SU3	-112.25636	40.72161	6/19/2016			X				X									X									
DU1-SU3	-112.25636	40.71936	6/19/2016			X			X																			
DU1-SU3	-112.25636	40.71712	6/19/2016			X			X								X											
DU1-SU3	-112.25636	40.71487	6/19/2016			X				X									X									
DU1-SU3	-112.25636	40.71263	6/19/2016			X			X								X											
DU1-SU3	-112.25636	40.71038	6/19/2016			X			X								X											
DU1-SU3	-112.25636	40.70813	6/19/2016			X			X																			
DU1-SU3	-112.25340	40.72161	6/19/2016			X				X									X									
DU1-SU3	-112.25340	40.71936	6/19/2016			X			X									X	X									
DU1-SU3	-112.25340	40.71712	6/19/2016			X			X									X	X									
DU1-SU3	-112.25340	40.71487	6/19/2016			X			X									X	X									
DU1-SU3	-112.25340	40.71263	6/19/2016			X			X																			
DU1-SU3	-112.25340	40.71038	6/19/2016			X			X																			
DU1-SU3	-112.25043	40.72385	6/19/2016			X	X																					
DU1-SU3	-112.25043	40.72161	6/19/2016			X			X									X	X									
DU1-SU3	-112.25043	40.71936	6/19/2016			X			X									X	X									
DU1-SU3	-112.25043	40.71712	6/19/2016			X			X																			
DU1-SU3	-112.25043	40.71487	6/19/2016			X			X									X										
DU1-SU3	-112.24747	40.72385	6/19/2016			X	X																					
DU1-SU3	-112.24747	40.72161	6/19/2016			X			X																			
DU1-SU3	-112.24747	40.71936	6/19/2016			X			X								X		X									
DU1-SU3	-112.24747	40.71712	6/19/2016			X			X										X									
DU1-SU3	-112.24747	40.71487	6/19/2016			X			X					X														
DU1-SU3	-112.24450	40.72385	6/19/2016			X	X																					
DU1-SU3	-112.24450	40.72161	6/19/2016			X			X										X									
DU1-SU3	-112.24450	40.71936	6/19/2016			X			X									X	X									
DU1-SU3	-112.24450	40.71712	6/19/2016			X			X									X	X									
DU1-SU3	-112.24154	40.72385	6/19/2016			X	X																					
DU1-SU3	-112.24154	40.72161	6/19/2016			X			X									X										
DU1-SU3	-112.24154	40.71936	6/19/2016			X			X									X										
DU1-SU3	-112.24154	40.71712	6/19/2016			X			X									X										
DU1-SU3	-112.23857	40.72610	6/19/2016			X	X																					
DU1-SU3	-112.23857	40.72385	6/19/2016			X				X									X									
DU1-SU3	-112.23857	40.72161	6/19/2016			X			X								X											
DU1-SU3	-112.23857	40.71936	6/19/2016		X				X										X									
DU1-SU3	-112.23561	40.72385	6/19/2016			X			X								X											
DU1-SU3	-112.23561	40.72161	6/19/2016			X			X									X										
DU1-SU3	-112.23264	40.72385	6/19/2016			X			X																			
DU1-SU3	-112.23264	40.72161	6/19/2016			X			X									X										
DU1-SU3	-112.22968	40.72385	6/19/2016			X			X									X	X									

Sample ID	Longitude	Latitude	Date	V	SV	NV	TC	MC	SC	NC	ETC	EMC	ESC	VF	COL	COM	COS	SA	B	SND	BM	EBM	BH	HAL	GYP	HEX	CIR	MR
DU1-SU4	-112.19696	40.74622	6/21/2016			X				X									X									
DU1-SU4	-112.19399	40.75071	6/21/2016			X				X									X									
DU1-SU4	-112.19399	40.74846	6/21/2016			X			X									X										
DU1-SU4	-112.19399	40.74622	6/21/2016			X			X																			
DU1-SU4	-112.19399	40.74397	6/21/2016			X			X									X										
DU1-SU4	-112.19399	40.74173	6/21/2016			X			X									X										
DU1-SU4	-112.19102	40.76418	6/21/2016			X				X									X									
DU1-SU4	-112.19102	40.76193	6/21/2016			X				X									X									
DU1-SU4	-112.19102	40.75969	6/21/2016			X			X									X	X									
DU1-SU4	-112.19102	40.75744	6/21/2016			X			X									X	X									
DU1-SU4	-112.19102	40.75520	6/21/2016			X			X										X									
DU1-SU4	-112.19102	40.75295	6/21/2016			X			X									X										
DU1-SU4	-112.19102	40.75071	6/21/2016			X							X						X									
DU1-SU4	-112.19102	40.74846	6/21/2016			X			X									X										
DU1-SU4	-112.19102	40.74622	6/21/2016			X			X									X										
DU1-SU4	-112.19102	40.74397	6/21/2016			X			X									X	X									
DU1-SU4	-112.19102	40.74173	6/21/2016			X			X									X	X									
DU1-SU4	-112.18806	40.76418	6/21/2016			X			X									X										
DU1-SU4	-112.18806	40.76193	6/21/2016			X			X									X										
DU1-SU4	-112.18806	40.75969	6/21/2016			X			X										X									
DU1-SU4	-112.18806	40.75744	6/21/2016			X			X									X	X									
DU1-SU4	-112.18806	40.75520	6/21/2016			X			X									X										
DU1-SU4	-112.18806	40.75295	6/21/2016			X			X									X										
DU1-SU4	-112.18806	40.75071	6/21/2016			X			X									X										
DU1-SU4	-112.18806	40.74846	6/21/2016			X			X									X										
DU1-SU4	-112.18509	40.76418	6/21/2016			X			X									X										
DU1-SU4	-112.18509	40.76193	6/21/2016			X			X									X	X									
DU1-SU4	-112.18509	40.75969	6/21/2016			X			X										X									
DU1-SU4	-112.18509	40.75744	6/21/2016			X			X										X									
DU1-SU4	-112.18509	40.75520	6/21/2016			X			X									X										
DU1-SU4	-112.18509	40.75295	6/21/2016			X			X																			
DU1-SU4	-112.18509	40.75071	6/21/2016			X			X									X										
DU1-SU4	-112.18509	40.74846	6/21/2016			X			X									X										
DU1-SU4	-112.18213	40.76418	6/21/2016			X			X									X										
DU1-SU4	-112.18213	40.76193	6/21/2016			X			X									X										
DU1-SU4	-112.18213	40.75969	6/21/2016			X			X																			
DU1-SU4	-112.18213	40.75744	6/21/2016			X			X									X										
DU1-SU4	-112.18213	40.75520	6/21/2016			X			X									X										
DU1-SU4	-112.18213	40.75295	6/21/2016			X			X									X	X									
DU1-SU4	-112.18213	40.75071	6/21/2016			X			X									X										
DU1-SU4	-112.17916	40.76418	6/21/2016			X			X									X										
DU1-SU4	-112.17916	40.76193	6/21/2016			X			X									X										
DU1-SU4	-112.17916	40.75969	6/21/2016			X			X									X										
DU1-SU4	-112.17916	40.75744	6/21/2016			X			X									X										
DU1-SU4	-112.17916	40.75520	6/21/2016			X			X									X	X									
DU1-SU4	-112.17916	40.75295	6/21/2016			X			X										X									
DU1-SU4	-112.17916	40.75071	6/21/2016			X			X									X										
DU1-SU4	-112.17620	40.76418	6/21/2016			X			X									X	X									
DU1-SU4	-112.17620	40.76193	6/21/2016			X			X									X										
DU1-SU4	-112.17620	40.75969	6/21/2016			X			X									X										
DU1-SU4	-112.17620	40.75744	6/21/2016			X			X									X										
DU1-SU4	-112.17620	40.75520	6/21/2016			X			X									X	X									
DU1-SU4	-112.17620	40.75295	6/21/2016			X			X										X									
DU1-SU4	-112.17323	40.76418	6/21/2016		X				X					X														
DU1-SU4	-112.17323	40.76193	6/21/2016			X			X									X	X									
DU1-SU4	-112.17323	40.75969	6/21/2016			X			X									X	X									
DU1-SU4	-112.17323	40.75744	6/21/2016			X			X									X	X									

Sample ID	Longitude	Latitude	Date	V	SV	NV	TC	MC	SC	NC	ETC	EMC	ESC	VF	COL	COM	COS	SA	B	SND	BM	EBM	BH	HAL	GYP	HEX	CIR	MR
DU1-SU5	-112.18806	40.76867	7/1/2016			X			X									X	X									
DU1-SU5	-112.18806	40.76643	7/1/2016			X			X									X										
DU1-SU5	-112.18509	40.76867	7/1/2016			X			X									X	X									
DU1-SU5	-112.18509	40.76643	7/1/2016			X			X									X										
DU1-SU5	-112.18213	40.76867	7/1/2016			X			X									X										
DU1-SU5	-112.18213	40.76643	7/1/2016			X			X																			
DU1-SU5	-112.17916	40.77765	7/1/2016			X				X																		
DU1-SU5	-112.17916	40.77541	7/1/2016			X			X							X												
DU1-SU5	-112.17916	40.77316	7/1/2016			X			X									X	X									
DU1-SU5	-112.17916	40.76643	7/1/2016			X			X									X										
DU1-SU5	-112.17620	40.77990	7/1/2016			X			X									X										
DU1-SU5	-112.17620	40.77765	7/1/2016			X			X								X											
DU1-SU5	-112.17620	40.77541	7/1/2016			X			X									X										
DU1-SU5	-112.17620	40.77316	7/1/2016			X			X							X		X	X									
DU1-SU5	-112.17620	40.77092	7/1/2016			X			X									X										
DU1-SU5	-112.17620	40.76643	7/1/2016			X			X																			
DU1-SU5	-112.17323	40.78215	7/1/2016			X			X									X										
DU1-SU5	-112.17323	40.77990	7/1/2016			X			X									X										
DU1-SU5	-112.17323	40.77765	7/1/2016			X			X									X	X									
DU1-SU5	-112.17323	40.77541	7/1/2016			X			X									X	X									
DU1-SU5	-112.17323	40.77316	7/1/2016		X				X					X														
DU1-SU5	-112.17323	40.77092	7/1/2016			X			X									X										
DU1-SU5	-112.17323	40.76867	7/1/2016			X			X									X	X									
DU1-SU5	-112.17323	40.76643	7/1/2016			X		X										X										
DU1-SU5	-112.17027	40.78215	7/1/2016			X			X									X	X									
DU1-SU5	-112.17027	40.77990	7/1/2016			X			X									X										
DU1-SU5	-112.17027	40.77765	7/1/2016			X			X									X	X									
DU1-SU5	-112.17027	40.77541	7/1/2016			X			X									X										
DU1-SU5	-112.17027	40.77316	7/1/2016	X																								
DU1-SU5	-112.17027	40.77092	7/1/2016			X			X									X	X									
DU1-SU5	-112.17027	40.76867	7/1/2016			X			X									X	X									
DU1-SU5	-112.17027	40.76643	7/1/2016			X			X										X									
DU1-SU5	-112.16730	40.78215	7/1/2016			X			X									X										
DU1-SU5	-112.16730	40.77990	7/1/2016			X			X									X	X									
DU1-SU5	-112.16730	40.77765	7/1/2016			X			X									X	X									
DU1-SU5	-112.16730	40.77541	7/1/2016			X			X									X	X									
DU1-SU5	-112.16730	40.77316	7/1/2016			X			X									X										
DU1-SU5	-112.16730	40.77092	7/1/2016			X			X									X	X									
DU1-SU5	-112.16730	40.76867	7/1/2016			X			X									X	X									
DU1-SU5	-112.16730	40.76643	7/1/2016			X			X									X	X									
DU1-SU5	-112.16434	40.78215	7/1/2016			X			X									X	X									
DU1-SU5	-112.16434	40.77990	7/1/2016			X			X									X										
DU1-SU5	-112.16434	40.77765	7/1/2016			X			X									X	X									
DU1-SU5	-112.16434	40.77541	7/1/2016			X			X									X	X									
DU1-SU5	-112.16434	40.77316	7/1/2016			X			X									X	X									
DU1-SU5	-112.16434	40.77092	7/1/2016			X			X									X	X									
DU1-SU5	-112.16434	40.76867	7/1/2016			X			X									X	X									
DU1-SU5	-112.16434	40.76643	7/1/2016			X			X									X	X									
DU1-SU5	-112.16137	40.78215	7/1/2016			X			X									X	X									
DU1-SU5	-112.16137	40.77990	7/1/2016			X			X									X	X									
DU1-SU5	-112.16137	40.77765	7/1/2016			X			X									X	X									

Sample ID	Longitude	Latitude	Date	V	SV	NV	TC	MC	SC	NC	ETC	EMC	ESC	VF	COL	COM	COS	SA	B	SND	BM	EBM	BH	HAL	GYP	HEX	CIR	MR
DU1-SU5	-112.16137	40.77541	7/1/2016			X			X									X	X									
DU1-SU5	-112.16137	40.77316	7/1/2016			X			X									X										
DU1-SU5	-112.16137	40.77092	7/1/2016			X			X									X	X									
DU1-SU5	-112.16137	40.76867	7/1/2016			X			X									X	X									
DU1-SU5	-112.16137	40.76643	7/1/2016			X			X									X	X									
DU1-SU5	-112.15841	40.78215	7/1/2016			X			X									X										
DU1-SU5	-112.15841	40.77990	7/1/2016			X			X									X										
DU1-SU5	-112.15841	40.77765	7/1/2016			X			X									X										
DU1-SU5	-112.15841	40.77541	7/1/2016			X			X									X	X									
DU1-SU5	-112.15841	40.77316	7/1/2016			X			X									X	X									
DU1-SU5	-112.15841	40.77092	7/1/2016			X			X									X	X									
DU1-SU5	-112.15841	40.76867	7/1/2016			X			X									X	X									
DU1-SU5	-112.15544	40.78215	7/1/2016			X			X									X										
DU1-SU5	-112.15544	40.77990	7/1/2016			X			X									X										
DU1-SU5	-112.15544	40.77765	7/1/2016			X			X									X	X									
DU1-SU5	-112.15544	40.77541	7/1/2016			X			X									X	X									
DU1-SU5	-112.15544	40.77316	7/1/2016			X			X									X	X									
DU1-SU5	-112.15248	40.78215	7/1/2016		X				X					X														
DU1-SU5	-112.15248	40.77990	7/1/2016			X			X									X										
DU1-SU5	-112.15248	40.77765	7/1/2016			X			X									X	X									
DU1-SU5	-112.15248	40.77541	7/1/2016			X			X									X	X									
DU1-SU5	-112.15248	40.77316	7/1/2016			X			X									X	X									

Sample ID	Longitude	Latitude	Date	V	SV	NV	TC	MC	SC	NC	ETC	EMC	ESC	VF	COL	COM	COS	SA	B	SND	BM	EBM	BH	HAL	GYP	HEX	CIR	MR
DU1-SU6	-112.15840	40.79113	7/19/2016			X			X									X										
DU1-SU6	-112.15543	40.79337	7/19/2016			X			X									X										
DU1-SU6	-112.15543	40.79113	7/19/2016			X			X									X										
DU1-SU6	-112.15543	40.78888	7/19/2016			X			X									X										
DU1-SU6	-112.15247	40.79786	7/19/2016			X			X									X										
DU1-SU6	-112.15247	40.79562	7/19/2016			X			X									X	X									
DU1-SU6	-112.15247	40.79337	7/19/2016			X							X	X														
DU1-SU6	-112.15247	40.79113	7/19/2016			X			X									X										
DU1-SU6	-112.15247	40.78888	7/19/2016			X			X									X										
DU1-SU6	-112.15247	40.78664	7/19/2016			X			X									X										
DU1-SU6	-112.15247	40.78439	7/19/2016			X		X									X											
DU1-SU6	-112.14950	40.80011	7/19/2016			X		X																				
DU1-SU6	-112.14950	40.79786	7/19/2016			X			X										X									
DU1-SU6	-112.14950	40.79562	7/19/2016			X			X									X										
DU1-SU6	-112.14950	40.79337	7/19/2016		X								X	X														
DU1-SU6	-112.14950	40.79113	7/19/2016			X			X									X										
DU1-SU6	-112.14950	40.78888	7/19/2016			X			X									X										
DU1-SU6	-112.14950	40.78664	7/19/2016			X			X									X										
DU1-SU6	-112.14950	40.78439	7/19/2016			X			X									X										
DU1-SU6	-112.14654	40.80011	7/19/2016		X								X	X														
DU1-SU6	-112.14654	40.79786	7/19/2016		X								X	X														
DU1-SU6	-112.14654	40.79562	7/19/2016			X							X	X														
DU1-SU6	-112.14654	40.79337	7/19/2016			X							X	X														
DU1-SU6	-112.14654	40.79113	7/19/2016			X			X									X										
DU1-SU6	-112.14654	40.78888	7/19/2016			X			X									X										
DU1-SU6	-112.14654	40.78664	7/19/2016			X			X									X										
DU1-SU6	-112.14654	40.78439	7/19/2016			X			X									X										
DU1-SU6	-112.14357	40.79786	7/19/2016		X								X	X														
DU1-SU6	-112.14357	40.79562	7/19/2016			X							X	X														
DU1-SU6	-112.14357	40.79337	7/19/2016			X			X									X										
DU1-SU6	-112.14357	40.79113	7/19/2016			X			X									X										
DU1-SU6	-112.14357	40.78888	7/19/2016			X			X									X										
DU1-SU6	-112.14357	40.78664	7/19/2016			X			X									X										
DU1-SU6	-112.14357	40.78439	7/19/2016			X			X									X										
DU1-SU6	-112.14061	40.79562	7/19/2016			X			X									X										
DU1-SU6	-112.14061	40.79337	7/19/2016		X				X									X										
DU1-SU6	-112.14061	40.79113	7/19/2016			X			X									X										
DU1-SU6	-112.14061	40.78888	7/19/2016			X			X									X										
DU1-SU6	-112.14061	40.78664	7/19/2016			X			X									X										
DU1-SU6	-112.14061	40.78439	7/19/2016			X			X									X										
DU1-SU6	-112.13764	40.79562	7/19/2016			X			X									X	X									
DU1-SU6	-112.13764	40.79337	7/19/2016			X			X									X										
DU1-SU6	-112.13764	40.79113	7/19/2016			X			X									X										
DU1-SU6	-112.13764	40.78888	7/19/2016			X			X									X										
DU1-SU6	-112.13764	40.78664	7/19/2016		X				X					X														
DU1-SU6	-112.13764	40.78439	7/19/2016			X			X									X										
DU1-SU6	-112.13468	40.79562	7/19/2016			X			X									X	X									
DU1-SU6	-112.13468	40.79337	7/19/2016			X			X									X	X									
DU1-SU6	-112.13468	40.79113	7/19/2016			X			X									X										
DU1-SU6	-112.13468	40.78888	7/19/2016			X			X									X										
DU1-SU6	-112.13468	40.78664	7/19/2016	X																								
DU1-SU6	-112.13468	40.78439	7/19/2016		X				X																			
DU1-SU6	-112.13171	40.79562	7/19/2016			X			X									X	X									
DU1-SU6	-112.13171	40.79337	7/19/2016			X			X									X	X									
DU1-SU6	-112.13171	40.79113	7/19/2016			X			X									X										
DU1-SU6	-112.13171	40.78888	7/19/2016			X			X									X										
DU1-SU6	-112.13171	40.78664	7/19/2016			X			X									X										
DU1-SU6	-112.12875	40.79562	7/19/2016			X			X									X										
DU1-SU6	-112.12875	40.79337	7/19/2016			X			X									X										
DU1-SU6	-112.12875	40.79113	7/19/2016			X			X									X										
DU1-SU6	-112.12875	40.78888	7/19/2016			X			X									X										
DU1-SU6	-112.12875	40.78664	7/19/2016			X			X									X										

Sample ID	Longitude	Latitude	Date	V	SV	NV	TC	MC	SC	NC	ETC	EMC	ESC	VF	COL	COM	COS	SA	B	SND	BM	EBM	BH	HAL	GYP	HEX	CIR	MR
DU1-SU7	-112.15247	40.81359	7/20/2016			X			X								X	X										
DU1-SU7	-112.14950	40.81583	7/20/2016			X			X									X	X									
DU1-SU7	-112.14950	40.81359	7/20/2016			X			X									X	X									
DU1-SU7	-112.14950	40.81134	7/20/2016			X			X									X	X									
DU1-SU7	-112.14950	40.80910	7/20/2016			X			X									X	X									
DU1-SU7	-112.14950	40.80685	7/20/2016			X			X									X	X									
DU1-SU7	-112.14950	40.80461	7/20/2016			X			X									X										
DU1-SU7	-112.14950	40.80236	7/20/2016			X			X									X	X									
DU1-SU7	-112.14654	40.81808	7/20/2016			X			X								X	X										
DU1-SU7	-112.14654	40.81583	7/20/2016			X							X					X	X									
DU1-SU7	-112.14654	40.81359	7/20/2016			X			X									X	X									
DU1-SU7	-112.14654	40.81134	7/20/2016			X			X									X	X									
DU1-SU7	-112.14654	40.80910	7/20/2016			X			X									X										
DU1-SU7	-112.14654	40.80685	7/20/2016			X			X									X	X									
DU1-SU7	-112.14654	40.80461	7/20/2016			X			X									X										
DU1-SU7	-112.14654	40.80236	7/20/2016			X			X									X	X									
DU1-SU7	-112.14357	40.81808	7/20/2016		X				X																			
DU1-SU7	-112.14357	40.81583	7/20/2016			X			X									X	X									
DU1-SU7	-112.14357	40.81359	7/20/2016			X			X									X										
DU1-SU7	-112.14357	40.81134	7/20/2016		X								X	X														
DU1-SU7	-112.14357	40.80910	7/20/2016			X			X									X	X									
DU1-SU7	-112.14357	40.80685	7/20/2016			X			X									X	X									
DU1-SU7	-112.14357	40.80461	7/20/2016			X			X									X	X									
DU1-SU7	-112.14061	40.81808	7/20/2016			X			X									X	X									
DU1-SU7	-112.14061	40.81583	7/20/2016		X								X	X														
DU1-SU7	-112.14061	40.81359	7/20/2016			X			X									X	X									
DU1-SU7	-112.14061	40.81134	7/20/2016			X			X																			
DU1-SU7	-112.14061	40.80910	7/20/2016			X			X									X										
DU1-SU7	-112.14061	40.80685	7/20/2016	X						X				X														
DU1-SU7	-112.14061	40.80461	7/20/2016		X			X						X														
DU1-SU7	-112.13764	40.81583	7/20/2016			X			X									X	X									
DU1-SU7	-112.13764	40.81359	7/20/2016			X			X										X									
DU1-SU7	-112.13764	40.81134	7/20/2016			X			X									X	X									
DU1-SU7	-112.13764	40.80910	7/20/2016			X			X									X										
DU1-SU7	-112.13764	40.80685	7/20/2016			X			X									X										
DU1-SU7	-112.13764	40.80461	7/20/2016			X							X	X														
DU1-SU7	-112.13468	40.80685	7/20/2016			X			X										X									
DU1-SU7	-112.13468	40.80461	7/20/2016			X			X																			
DU1-SU7	-112.13468	40.80236	7/20/2016			X			X									X										
DU1-SU7	-112.13171	40.80461	7/20/2016			X			X									X	X									
DU1-SU7	-112.13171	40.80236	7/20/2016			X			X										X									
DU1-SU7	-112.13171	40.80012	7/20/2016			X			X										X									

Sample ID	Longitude	Latitude	Date	V	SV	NV	TC	MC	SC	NC	ETC	EMC	ESC	VF	COL	COM	COS	SA	B	SND	BM	EBM	BH	HAL	GYP	HEX	CIR	MR
DU2-SU1	-112.16802	40.85369	7/4/2016			X			X									X										
DU2-SU1	-112.16802	40.84920	7/4/2016			X			X									X	X									
DU2-SU1	-112.16802	40.84471	7/4/2016		X				X							X		X										
DU2-SU1	-112.16802	40.84022	7/4/2016			X			X									X										
DU2-SU1	-112.16802	40.83573	7/4/2016			X			X									X	X									
DU2-SU1	-112.16802	40.83124	7/4/2016			X			X									X										
DU2-SU1	-112.16802	40.82674	7/4/2016			X				X									X									
DU2-SU1	-112.16209	40.85369	7/4/2016		X					X				X														
DU2-SU1	-112.16209	40.84920	7/4/2016			X			X									X										
DU2-SU1	-112.16209	40.84471	7/4/2016			X			X									X										
DU2-SU1	-112.16209	40.84022	7/4/2016			X			X									X										
DU2-SU1	-112.16209	40.83573	7/4/2016			X			X									X	X									
DU2-SU1	-112.16209	40.83124	7/4/2016			X			X									X	X									
DU2-SU1	-112.16209	40.82674	7/4/2016			X			X									X										
DU2-SU1	-112.16209	40.82225	7/4/2016			X				X									X									
DU2-SU1	-112.15616	40.85369	7/4/2016	X						X				X														
DU2-SU1	-112.15616	40.84920	7/4/2016			X			X									X										
DU2-SU1	-112.15616	40.84471	7/4/2016			X			X									X										
DU2-SU1	-112.15616	40.84022	7/4/2016			X			X									X										
DU2-SU1	-112.15616	40.83573	7/4/2016			X			X									X	X									
DU2-SU1	-112.15616	40.83124	7/4/2016			X			X								X	X	X									
DU2-SU1	-112.15616	40.82674	7/4/2016			X			X									X	X									
DU2-SU1	-112.15616	40.82225	7/4/2016			X			X									X	X									
DU2-SU1	-112.15023	40.85369	7/4/2016			X			X								X	X										
DU2-SU1	-112.15023	40.84920	7/4/2016			X			X									X										
DU2-SU1	-112.15023	40.84471	7/4/2016			X			X									X										
DU2-SU1	-112.15023	40.84022	7/4/2016			X			X									X										
DU2-SU1	-112.15023	40.83573	7/4/2016			X			X									X										
DU2-SU1	-112.15023	40.83124	7/4/2016			X			X									X	X									
DU2-SU1	-112.15023	40.82674	7/4/2016			X			X									X	X									
DU2-SU1	-112.15023	40.82225	7/4/2016			X			X									X										
DU2-SU1	-112.14430	40.85369	7/4/2016			X			X								X	X										
DU2-SU1	-112.14430	40.84920	7/4/2016			X			X								X	X										
DU2-SU1	-112.14430	40.84471	7/4/2016			X			X									X										
DU2-SU1	-112.14430	40.84022	7/4/2016			X			X									X	X									
DU2-SU1	-112.14430	40.83573	7/4/2016			X			X									X	X									
DU2-SU1	-112.14430	40.83124	7/4/2016			X			X									X										
DU2-SU1	-112.14430	40.82674	7/4/2016			X			X									X										
DU2-SU1	-112.13837	40.85369	7/4/2016			X			X								X	X										
DU2-SU1	-112.13837	40.84920	7/4/2016			X			X								X	X										
DU2-SU1	-112.13837	40.84471	7/4/2016			X			X								X	X										
DU2-SU1	-112.13837	40.84022	7/4/2016			X			X									X										
DU2-SU1	-112.13837	40.83573	7/4/2016			X			X									X										
DU2-SU1	-112.13837	40.83124	7/4/2016			X			X									X										
DU2-SU1	-112.13837	40.82674	7/4/2016			X			X									X	X									
DU2-SU1	-112.13244	40.85369	7/4/2016			X			X								X	X										
DU2-SU1	-112.13244	40.84920	7/4/2016			X			X									X										
DU2-SU1	-112.13244	40.84471	7/4/2016			X			X									X										
DU2-SU1	-112.13244	40.84022	7/4/2016			X			X									X										
DU2-SU1	-112.13244	40.83573	7/4/2016			X			X									X										
DU2-SU1	-112.13244	40.83124	7/4/2016			X			X									X										
DU2-SU1	-112.13244	40.82674	7/4/2016			X			X								X	X										
DU2-SU1	-112.12651	40.85369	7/4/2016			X							X	X														
DU2-SU1	-112.12651	40.84920	7/4/2016			X			X								X	X										
DU2-SU1	-112.12651	40.84471	7/4/2016			X			X									X	X									

Sample ID	Longitude	Latitude	Date	V	SV	NV	TC	MC	SC	NC	ETC	EMC	ESC	VF	COL	COM	COS	SA	B	SND	BM	EBM	BH	HAL	GYP	HEX	CIR	MR
DU2-SU2	-112.16802	40.87166	7/21/2016			X			X								X	X										
DU2-SU2	-112.16802	40.86717	7/21/2016			X			X								X	X										
DU2-SU2	-112.16802	40.86268	7/21/2016			X			X								X	X										
DU2-SU2	-112.16802	40.85819	7/21/2016			X			X									X										
DU2-SU2	-112.16209	40.87166	7/21/2016			X			X								X	X										
DU2-SU2	-112.16209	40.86717	7/21/2016			X			X								X	X										
DU2-SU2	-112.16209	40.86268	7/21/2016			X			X								X	X										
DU2-SU2	-112.16209	40.85819	7/21/2016			X			X									X										
DU2-SU2	-112.15616	40.87166	7/21/2016			X			X								X	X										
DU2-SU2	-112.15616	40.86717	7/21/2016			X			X								X	X										
DU2-SU2	-112.15616	40.86268	7/21/2016			X			X								X	X										
DU2-SU2	-112.15616	40.85819	7/21/2016			X			X									X										
DU2-SU2	-112.15023	40.87166	7/21/2016			X			X								X	X										
DU2-SU2	-112.15023	40.86717	7/21/2016			X			X								X	X										
DU2-SU2	-112.15023	40.86268	7/21/2016			X			X								X	X										
DU2-SU2	-112.15023	40.85819	7/21/2016			X			X									X										
DU2-SU2	-112.14430	40.87166	7/21/2016			X			X								X	X										
DU2-SU2	-112.14430	40.86717	7/21/2016			X			X								X	X										
DU2-SU2	-112.14430	40.86268	7/21/2016			X			X								X	X										
DU2-SU2	-112.14430	40.85819	7/21/2016			X			X								X	X										
DU2-SU2	-112.13837	40.87166	7/21/2016			X			X								X	X										
DU2-SU2	-112.13837	40.86717	7/21/2016			X			X								X	X										
DU2-SU2	-112.13837	40.86268	7/21/2016			X			X								X	X										
DU2-SU2	-112.13837	40.85819	7/21/2016			X			X								X	X										
DU2-SU2	-112.13244	40.87166	7/21/2016			X			X									X										
DU2-SU2	-112.13244	40.86717	7/21/2016			X			X									X										
DU2-SU2	-112.13244	40.86268	7/21/2016			X			X								X	X										
DU2-SU2	-112.13244	40.85819	7/21/2016			X			X								X	X										
DU2-SU2	-112.12651	40.87166	7/21/2016			X			X									X										
DU2-SU2	-112.12651	40.86717	7/21/2016			X			X									X										
DU2-SU2	-112.12651	40.86268	7/21/2016			X			X								X	X										
DU2-SU2	-112.12651	40.85819	7/21/2016			X			X								X	X										
DU2-SU2	-112.12058	40.87166	7/21/2016			X			X									X										
DU2-SU2	-112.12058	40.86717	7/21/2016			X			X								X	X										
DU2-SU2	-112.12058	40.86268	7/21/2016			X			X								X	X										
DU2-SU2	-112.12058	40.85819	7/21/2016			X			X								X	X										
DU2-SU2	-112.11465	40.87166	7/21/2016			X			X									X										
DU2-SU2	-112.11465	40.86717	7/21/2016			X			X								X	X										
DU2-SU2	-112.11465	40.86268	7/21/2016			X			X								X	X										
DU2-SU2	-112.11465	40.85819	7/21/2016			X			X									X										
DU2-SU2	-112.10872	40.87166	7/21/2016			X			X									X										
DU2-SU2	-112.10872	40.86717	7/21/2016			X			X								X	X										
DU2-SU2	-112.10872	40.86268	7/21/2016			X			X									X										
DU2-SU2	-112.10872	40.85819	7/21/2016			X			X									X										
DU2-SU2	-112.10279	40.87166	7/21/2016			X			X									X										
DU2-SU2	-112.10279	40.86717	7/21/2016			X			X									X										
DU2-SU2	-112.10279	40.86268	7/21/2016						X									X										

Sample ID	Longitude	Latitude	Date	V	SV	NV	TC	MC	SC	NC	ETC	EMC	ESC	VF	COL	COM	COS	SA	B	SND	BM	EBM	BH	HAL	GYP	HEX	CIR	MR
DU2-SU3	-112.12057	40.90759	7/7/2016			X			X							X		X										
DU2-SU3	-112.12057	40.90310	7/7/2016			X			X								X	X										
DU2-SU3	-112.12057	40.89861	7/7/2016			X			X								X	X										
DU2-SU3	-112.12057	40.89412	7/7/2016			X			X								X	X										
DU2-SU3	-112.12057	40.88963	7/7/2016			X			X								X	X										
DU2-SU3	-112.12057	40.88514	7/7/2016			X			X									X										
DU2-SU3	-112.12057	40.88064	7/7/2016			X			X									X										
DU2-SU3	-112.12057	40.87615	7/7/2016			X			X									X										
DU2-SU3	-112.11464	40.90759	7/7/2016			X			X							X		X										
DU2-SU3	-112.11464	40.90310	7/7/2016			X			X								X	X										
DU2-SU3	-112.11464	40.89861	7/7/2016			X			X								X	X										
DU2-SU3	-112.11464	40.89412	7/7/2016			X							X	X				X										
DU2-SU3	-112.11464	40.88963	7/7/2016			X			X								X	X										
DU2-SU3	-112.11464	40.88514	7/7/2016			X			X								X	X										
DU2-SU3	-112.11464	40.88064	7/7/2016			X			X									X										
DU2-SU3	-112.11464	40.87615	7/7/2016			X							X					X										
DU2-SU3	-112.10871	40.90759	7/7/2016			X							X				X	X										
DU2-SU3	-112.10871	40.90310	7/7/2016			X			X								X	X										
DU2-SU3	-112.10871	40.89861	7/7/2016			X							X					X										
DU2-SU3	-112.10871	40.89412	7/7/2016			X							X	X				X										
DU2-SU3	-112.10871	40.88963	7/7/2016			X			X									X										
DU2-SU3	-112.10871	40.88514	7/7/2016			X							X	X			X	X										
DU2-SU3	-112.10871	40.88064	7/7/2016			X							X					X										
DU2-SU3	-112.10871	40.87615	7/7/2016			X			X									X	X									
DU2-SU3	-112.10278	40.90759	7/7/2016			X							X				X	X										
DU2-SU3	-112.10278	40.90310	7/7/2016			X			X								X	X										
DU2-SU3	-112.10278	40.89861	7/7/2016			X		X						X		X												
DU2-SU3	-112.10278	40.89412	7/7/2016			X			X							X		X										
DU2-SU3	-112.10278	40.88963	7/7/2016			X			X									X										
DU2-SU3	-112.10278	40.88514	7/7/2016			X							X	X				X										
DU2-SU3	-112.10278	40.88064	7/7/2016		X								X	X														
DU2-SU3	-112.10278	40.87615	7/7/2016			X		X						X														
DU2-SU3	-112.09685	40.90759	7/7/2016			X							X	X			X	X										
DU2-SU3	-112.09685	40.90310	7/7/2016			X							X	X				X										
DU2-SU3	-112.09685	40.89861	7/7/2016			X				X				X														
DU2-SU3	-112.09685	40.89412	7/7/2016			X							X	X				X										
DU2-SU3	-112.09092	40.90759	7/7/2016			X				X				X						X								
DU2-SU3	-112.09092	40.90310	7/7/2016			X				X				X						X								
DU2-SU3	-112.09092	40.89861	7/7/2016			X			X									X										
DU2-SU3	-112.09092	40.89412	7/7/2016			X							X	X				X										
DU2-SU3	-112.08499	40.90759	7/7/2016			X							X	X		X												
DU2-SU3	-112.08499	40.90310	7/7/2016			X				X				X														
DU2-SU3	-112.08499	40.89861	7/7/2016			X							X					X										
DU2-SU3	-112.08499	40.89412	7/7/2016		X					X				X														
DU2-SU3	-112.07906	40.90759	7/7/2016			X						X			X													
DU2-SU3	-112.07906	40.90310	7/7/2016			X				X				X														
DU2-SU3	-112.07906	40.89861	7/7/2016			X			X									X										
DU2-SU3	-112.07906	40.89412	7/7/2016		X				X									X										

Sample ID	Longitude	Latitude	Date	V	SV	NV	TC	MC	SC	NC	ETC	EMC	ESC	VF	COL	COM	COS	SA	B	SND	BM	EBM	BH	HAL	GYP	HEX	CIR	MR
DU2-SU4	-112.16802	40.89861	9/4/2016			X			X									X										
DU2-SU4	-112.16802	40.89412	9/4/2016			X			X									X										
DU2-SU4	-112.16802	40.87615	9/4/2016			X							X	X		X												
DU2-SU4	-112.16209	40.90759	9/4/2016			X			X									X										
DU2-SU4	-112.16209	40.90310	9/4/2016			X			X									X										
DU2-SU4	-112.16209	40.89861	9/4/2016			X			X									X										
DU2-SU4	-112.16209	40.89412	9/4/2016			X			X									X										
DU2-SU4	-112.16209	40.88963	9/4/2016			X			X									X										
DU2-SU4	-112.16209	40.88514	9/4/2016			X			X									X										
DU2-SU4	-112.16209	40.88064	9/4/2016			X		X									X	X										
DU2-SU4	-112.16209	40.87615	9/4/2016			X	X										X	X										
DU2-SU4	-112.15616	40.90759	9/4/2016			X			X								X	X										
DU2-SU4	-112.15616	40.90310	9/4/2016			X			X								X	X										
DU2-SU4	-112.15616	40.89861	9/4/2016			X			X								X	X										
DU2-SU4	-112.15616	40.89412	9/4/2016			X			X								X	X										
DU2-SU4	-112.15616	40.88963	9/4/2016			X			X								X	X										
DU2-SU4	-112.15616	40.88514	9/4/2016			X			X								X	X										
DU2-SU4	-112.15616	40.88064	9/4/2016			X			X								X	X										
DU2-SU4	-112.15616	40.87615	9/4/2016			X			X								X	X										
DU2-SU4	-112.15023	40.90759	9/4/2016			X			X								X	X										
DU2-SU4	-112.15023	40.90310	9/4/2016			X			X								X	X										
DU2-SU4	-112.15023	40.89861	9/4/2016			X			X								X	X										
DU2-SU4	-112.15023	40.89412	9/4/2016			X			X								X	X										
DU2-SU4	-112.15023	40.88963	9/4/2016			X			X								X	X										
DU2-SU4	-112.15023	40.88514	9/4/2016			X			X								X	X										
DU2-SU4	-112.15023	40.88064	9/4/2016			X			X								X	X										
DU2-SU4	-112.15023	40.87615	9/4/2016			X			X								X	X										
DU2-SU4	-112.14430	40.90759	9/4/2016			X		X									X	X										
DU2-SU4	-112.14430	40.90310	9/4/2016			X			X								X	X										
DU2-SU4	-112.14430	40.89861	9/4/2016			X			X									X										
DU2-SU4	-112.14430	40.89412	9/4/2016			X		X									X	X										
DU2-SU4	-112.14430	40.88963	9/4/2016			X		X									X	X										
DU2-SU4	-112.14430	40.88514	9/4/2016			X		X									X	X										
DU2-SU4	-112.14430	40.88064	9/4/2016			X		X									X	X										
DU2-SU4	-112.14430	40.87615	9/4/2016			X			X								X	X										
DU2-SU4	-112.13837	40.90759	9/4/2016			X			X								X	X										
DU2-SU4	-112.13837	40.90310	9/4/2016			X			X									X										
DU2-SU4	-112.13837	40.89861	9/4/2016			X			X									X										
DU2-SU4	-112.13837	40.89412	9/4/2016			X			X								X	X										
DU2-SU4	-112.13837	40.88963	9/4/2016			X		X									X	X										
DU2-SU4	-112.13837	40.88514	9/4/2016			X			X								X	X										
DU2-SU4	-112.13837	40.88064	9/4/2016			X		X									X	X										
DU2-SU4	-112.13837	40.87615	9/4/2016			X		X									X	X										
DU2-SU4	-112.13244	40.90759	9/4/2016			X			X								X											
DU2-SU4	-112.13244	40.90310	9/4/2016			X	X										X	X										
DU2-SU4	-112.13244	40.89861	9/4/2016			X			X								X	X										
DU2-SU4	-112.13244	40.89412	9/4/2016			X			X								X	X										
DU2-SU4	-112.13244	40.88963	9/4/2016			X			X								X	X										
DU2-SU4	-112.13244	40.88514	9/4/2016			X							X	X				X										
DU2-SU4	-112.13244	40.88064	9/4/2016			X			X								X	X										
DU2-SU4	-112.13244	40.87615	9/4/2016			X			X								X	X										
DU2-SU4	-112.12651	40.90759	9/4/2016			X			X								X	X	X									
DU2-SU4	-112.12651	40.90310	9/4/2016			X			X								X	X										
DU2-SU4	-112.12651	40.89861	9/4/2016			X			X								X	X										
DU2-SU4	-112.12651	40.89412	9/4/2016			X			X								X	X										
DU2-SU4	-112.12651	40.88963	9/4/2016			X			X									X										
DU2-SU4	-112.12651	40.88514	9/4/2016			X			X									X	X									
DU2-SU4	-112.12651	40.88064	9/4/2016			X			X								X	X										
DU2-SU4	-112.12651	40.87615	9/4/2016			X			X								X	X										

Sample ID	Longitude	Latitude	Date	V	SV	NV	TC	MC	SC	NC	ETC	EMC	ESC	VF	COL	COM	COS	SA	B	SND	BM	EBM	BH	HAL	GYP	HEX	CIR	MR
DU2-SU5	-112.16209	40.94352	11/13/2016			X			X																			
DU2-SU5	-112.16209	40.93903	11/13/2016			X			X																			
DU2-SU5	-112.16209	40.93454	11/13/2016			X			X									X										
DU2-SU5	-112.16209	40.93005	11/13/2016			X			X								X	X										
DU2-SU5	-112.16209	40.92556	11/13/2016			X			X																			
DU2-SU5	-112.16209	40.92107	11/13/2016			X							X	X														
DU2-SU5	-112.16209	40.91657	11/13/2016			X			X								X	X										
DU2-SU5	-112.16209	40.91208	11/13/2016			X			X								X	X										
DU2-SU5	-112.15616	40.94352	11/13/2016			X			X																			
DU2-SU5	-112.15616	40.93903	11/13/2016			X			X									X										
DU2-SU5	-112.15616	40.93454	11/13/2016			X			X									X										
DU2-SU5	-112.15616	40.93005	11/13/2016			X			X								X	X										
DU2-SU5	-112.15616	40.92556	11/13/2016			X			X									X										
DU2-SU5	-112.15616	40.92107	11/13/2016			X			X																			
DU2-SU5	-112.15616	40.91657	11/13/2016			X			X								X	X										
DU2-SU5	-112.15616	40.91208	11/13/2016			X			X								X	X										
DU2-SU5	-112.15023	40.94352	11/13/2016			X			X					X		X												
DU2-SU5	-112.15023	40.93903	11/13/2016	X					X					X														
DU2-SU5	-112.15023	40.93454	11/13/2016			X			X					X			X											
DU2-SU5	-112.15023	40.93005	11/13/2016			X			X								X	X										
DU2-SU5	-112.15023	40.92556	11/13/2016			X			X									X										
DU2-SU5	-112.15023	40.92107	11/13/2016			X			X								X	X										
DU2-SU5	-112.15023	40.91657	11/13/2016			X			X								X	X										
DU2-SU5	-112.15023	40.91208	11/13/2016			X			X								X	X										
DU2-SU5	-112.14430	40.94352	11/13/2016			X			X								X	X										
DU2-SU5	-112.14430	40.93903	11/13/2016			X			X									X										
DU2-SU5	-112.14430	40.93454	11/13/2016			X			X								X	X										
DU2-SU5	-112.14430	40.93005	11/13/2016			X			X								X	X										
DU2-SU5	-112.14430	40.92556	11/13/2016			X			X								X	X										
DU2-SU5	-112.14430	40.92107	11/13/2016			X			X								X	X										
DU2-SU5	-112.14430	40.91657	11/13/2016			X			X								X	X										
DU2-SU5	-112.14430	40.91208	11/13/2016			X		X									X	X										
DU2-SU5	-112.13837	40.94352	11/13/2016			X			X								X											
DU2-SU5	-112.13837	40.93903	11/13/2016			X			X																			
DU2-SU5	-112.13837	40.93454	11/13/2016			X			X								X	X										
DU2-SU5	-112.13837	40.93005	11/13/2016			X			X									X										
DU2-SU5	-112.13837	40.92556	11/13/2016			X			X								X	X										
DU2-SU5	-112.13837	40.92107	11/13/2016			X			X								X	X										
DU2-SU5	-112.13837	40.91657	11/13/2016			X			X								X	X										
DU2-SU5	-112.13837	40.91208	11/13/2016			X		X									X	X										
DU2-SU5	-112.13244	40.94352	11/13/2016			X							X															
DU2-SU5	-112.13244	40.93903	11/13/2016			X			X																			
DU2-SU5	-112.13244	40.93454	11/13/2016			X			X								X	X										
DU2-SU5	-112.13244	40.93005	11/13/2016			X			X								X	X										
DU2-SU5	-112.13244	40.92556	11/13/2016			X			X								X	X										
DU2-SU5	-112.13244	40.92107	11/13/2016			X			X								X	X										
DU2-SU5	-112.13244	40.91657	11/13/2016			X			X								X	X										
DU2-SU5	-112.13244	40.91208	11/13/2016			X			X									X										
DU2-SU5	-112.12651	40.94352	11/13/2016			X			X					X														
DU2-SU5	-112.12651	40.93903	11/13/2016			X			X								X											
DU2-SU5	-112.12651	40.93454	11/13/2016			X			X					X			X	X										
DU2-SU5	-112.12651	40.93005	11/13/2016			X			X									X										
DU2-SU5	-112.12651	40.92556	11/13/2016			X			X								X	X										
DU2-SU5	-112.12651	40.92107	11/13/2016			X			X								X	X										
DU2-SU5	-112.12651	40.91657	11/13/2016			X			X								X	X										
DU2-SU5	-112.12651	40.91208	11/13/2016			X		X									X	X										

Sample ID	Longitude	Latitude	Date	V	SV	NV	TC	MC	SC	NC	ETC	EMC	ESC	VF	COL	COM	COS	SA	B	SND	BM	EBM	BH	HAL	GYP	HEX	CIR	MR
DU2-SU6	-112.12057	40.94352	9/8/2016			X			X								X	X										
DU2-SU6	-112.12057	40.93903	9/8/2016			X		X									X	X										
DU2-SU6	-112.12057	40.93454	9/8/2016			X			X									X		X								
DU2-SU6	-112.12057	40.93005	9/8/2016			X			X								X	X										
DU2-SU6	-112.12057	40.92556	9/8/2016			X			X								X	X										
DU2-SU6	-112.12057	40.92107	9/8/2016			X			X								X	X										
DU2-SU6	-112.12057	40.91657	9/8/2016			X	X									X		X										
DU2-SU6	-112.12057	40.91208	9/8/2016			X			X									X										
DU2-SU6	-112.11464	40.94352	9/8/2016			X			X											X								
DU2-SU6	-112.11464	40.93903	9/8/2016			X			X								X	X										
DU2-SU6	-112.11464	40.93454	9/8/2016			X	X									X		X										
DU2-SU6	-112.11464	40.93005	9/8/2016			X	X									X		X										
DU2-SU6	-112.11464	40.92556	9/8/2016			X	X									X		X										
DU2-SU6	-112.11464	40.92107	9/8/2016			X			X								X	X										
DU2-SU6	-112.11464	40.91657	9/8/2016			X			X								X	X										
DU2-SU6	-112.11464	40.91208	9/8/2016			X			X							X		X										
DU2-SU6	-112.10871	40.94352	9/8/2016			X							X	X			X	X										
DU2-SU6	-112.10871	40.93903	9/8/2016			X							X	X			X	X										
DU2-SU6	-112.10871	40.93454	9/8/2016			X							X	X			X	X										
DU2-SU6	-112.10871	40.93005	9/8/2016			X							X	X				X										
DU2-SU6	-112.10871	40.92556	9/8/2016			X		X									X	X										
DU2-SU6	-112.10871	40.92107	9/8/2016			X							X				X	X										
DU2-SU6	-112.10871	40.91657	9/8/2016			X			X								X	X										
DU2-SU6	-112.10871	40.91208	9/8/2016			X			X							X		X										
DU2-SU6	-112.10278	40.92556	9/8/2016			X							X	X				X										
DU2-SU6	-112.10278	40.92107	9/8/2016			X							X	X				X										
DU2-SU6	-112.10278	40.91657	9/8/2016			X			X									X										
DU2-SU6	-112.10278	40.91208	9/8/2016			X			X									X										
DU2-SU6	-112.09685	40.92107	9/8/2016			X							X	X				X										
DU2-SU6	-112.09685	40.91657	9/8/2016			X							X	X				X										
DU2-SU6	-112.09685	40.91208	9/8/2016			X							X	X				X										
DU2-SU6	-112.09092	40.91657	9/8/2016			X							X	X				X										
DU2-SU6	-112.09092	40.91208	9/8/2016			X							X	X				X										

Sample ID	Longitude	Latitude	Date	V	SV	NV	TC	MC	SC	NC	ETC	EMC	ESC	VF	COL	COM	COS	SA	B	SND	BM	EBM	BH	HAL	GYP	HEX	CIR	MR
DU2-SU7	-112.17396	40.97945	11/15/2016			X			X								X	X										
DU2-SU7	-112.17396	40.97496	11/15/2016			X			X																			
DU2-SU7	-112.17396	40.97047	11/15/2016			X			X								X	X										
DU2-SU7	-112.17396	40.96598	11/15/2016			X			X									X										
DU2-SU7	-112.16803	40.97945	11/15/2016			X			X							X												
DU2-SU7	-112.16803	40.97496	11/15/2016			X			X								X											
DU2-SU7	-112.16803	40.97047	11/15/2016			X			X								X											
DU2-SU7	-112.16803	40.96598	11/15/2016		X				X								X											
DU2-SU7	-112.16803	40.96149	11/15/2016		X				X								X	X										
DU2-SU7	-112.16210	40.97945	11/15/2016			X			X								X	X										
DU2-SU7	-112.16210	40.97496	11/15/2016			X			X							X		X										
DU2-SU7	-112.16210	40.97047	11/15/2016			X			X								X	X										
DU2-SU7	-112.16210	40.96598	11/15/2016			X			X								X	X										
DU2-SU7	-112.16210	40.96149	11/15/2016			X			X								X	X										
DU2-SU7	-112.16210	40.95700	11/15/2016			X			X								X	X										
DU2-SU7	-112.15617	40.97945	11/15/2016			X			X							X												
DU2-SU7	-112.15617	40.97496	11/15/2016			X			X							X		X										
DU2-SU7	-112.15617	40.97047	11/15/2016			X			X								X	X										
DU2-SU7	-112.15617	40.96598	11/15/2016			X			X								X	X										
DU2-SU7	-112.15617	40.96149	11/15/2016			X			X								X	X										
DU2-SU7	-112.15617	40.95700	11/15/2016			X			X								X											
DU2-SU7	-112.15617	40.95250	11/15/2016			X							X	X			X	X										
DU2-SU7	-112.15617	40.94801	11/15/2016			X			X								X	X										
DU2-SU7	-112.15024	40.97945	11/15/2016			X			X								X	X										
DU2-SU7	-112.15024	40.97496	11/15/2016			X			X								X	X										
DU2-SU7	-112.15024	40.97047	11/15/2016			X			X								X	X										
DU2-SU7	-112.15024	40.96598	11/15/2016			X			X								X	X										
DU2-SU7	-112.15024	40.96149	11/15/2016			X			X								X	X										
DU2-SU7	-112.15024	40.95700	11/15/2016			X			X																			
DU2-SU7	-112.15024	40.95250	11/15/2016			X			X								X	X										
DU2-SU7	-112.15024	40.94801	11/15/2016			X			X							X												
DU2-SU7	-112.14431	40.97945	11/15/2016		X				X					X						X								
DU2-SU7	-112.14431	40.97496	11/15/2016			X			X					X						X								
DU2-SU7	-112.14431	40.97047	11/15/2016			X			X									X										
DU2-SU7	-112.14431	40.96598	11/15/2016			X							X	X			X	X										
DU2-SU7	-112.14431	40.96149	11/15/2016			X			X								X	X										
DU2-SU7	-112.14431	40.95700	11/15/2016			X			X								X	X										
DU2-SU7	-112.14431	40.95250	11/15/2016			X			X									X										
DU2-SU7	-112.14431	40.94801	11/15/2016			X			X									X										
DU2-SU7	-112.13838	40.97496	11/15/2016		X					X				X						X								
DU2-SU7	-112.13838	40.97047	11/15/2016			X				X																		
DU2-SU7	-112.13838	40.96598	11/15/2016			X			X									X										
DU2-SU7	-112.13838	40.96149	11/15/2016			X			X									X										
DU2-SU7	-112.13838	40.95700	11/15/2016			X			X								X	X										
DU2-SU7	-112.13838	40.95250	11/15/2016			X				X				X						X								
DU2-SU7	-112.13838	40.94801	11/15/2016			X			X								X											
DU2-SU7	-112.13245	40.97496	11/15/2016			X			X								X	X										
DU2-SU7	-112.13245	40.95700	11/15/2016			X			X									X										
DU2-SU7	-112.13245	40.95250	11/15/2016			X				X				X						X								
DU2-SU7	-112.13245	40.94801	11/15/2016			X							X	X			X											
DU2-SU7	-112.12652	40.95700	11/15/2016			X			X								X	X										
DU2-SU7	-112.12652	40.95250	11/15/2016			X							X	X				X										
DU2-SU7	-112.12652	40.94801	11/15/2016			X			X									X										
DU2-SU7	-112.12059	40.95700	11/15/2016			X			X							X		X										
DU2-SU7	-112.12059	40.95250	11/15/2016			X			X									X										
DU2-SU7	-112.12059	40.94801	11/15/2016			X				X				X						X								
DU2-SU7	-112.11466	40.95700	11/15/2016			X			X										X									
DU2-SU7	-112.11466	40.95250	11/15/2016			X			X								X											
DU2-SU7	-112.11466	40.94801	11/15/2016			X				X				X						X								
DU2-SU7	-112.10873	40.94801	11/15/2016			X				X									X									

Sample ID	Longitude	Latitude	Date	V	SV	NV	TC	MC	SC	NC	ETC	EMC	ESC	VF	COL	COM	COS	SA	B	SND	BM	EBM	BH	HAL	GYP	HEX	CIR	MR
DU2-SU8	-112.19175	41.00640	11/20/2016			X			X								X											
DU2-SU8	-112.19175	41.00191	11/20/2016			X			X									X										
DU2-SU8	-112.19175	40.99742	11/20/2016			X			X																			
DU2-SU8	-112.19175	40.99293	11/20/2016			X			X								X	X										
DU2-SU8	-112.18582	41.01538	11/20/2016			X			X								X	X										
DU2-SU8	-112.18582	41.01089	11/20/2016			X			X								X	X										
DU2-SU8	-112.18582	41.00640	11/20/2016			X			X								X	X										
DU2-SU8	-112.18582	41.00191	11/20/2016			X			X									X										
DU2-SU8	-112.18582	40.99742	11/20/2016			X			X									X										
DU2-SU8	-112.18582	40.99293	11/20/2016		X				X								X	X										
DU2-SU8	-112.18582	40.98843	11/20/2016			X			X								X	X										
DU2-SU8	-112.18582	40.98394	11/20/2016		X				X								X	X										
DU2-SU8	-112.17989	41.01538	11/20/2016			X			X								X	X										
DU2-SU8	-112.17989	41.01089	11/20/2016			X			X									X										
DU2-SU8	-112.17989	41.00640	11/20/2016			X			X									X										
DU2-SU8	-112.17989	41.00191	11/20/2016			X			X							X		X										
DU2-SU8	-112.17989	40.99742	11/20/2016			X			X								X	X										
DU2-SU8	-112.17989	40.99293	11/20/2016			X			X									X										
DU2-SU8	-112.17989	40.98843	11/20/2016		X				X					X			X	X										
DU2-SU8	-112.17989	40.98394	11/20/2016		X			X						X		X												
DU2-SU8	-112.17396	41.01538	11/20/2016			X			X								X	X										
DU2-SU8	-112.17396	41.01089	11/20/2016			X			X									X										
DU2-SU8	-112.17396	41.00640	11/20/2016			X							X	X			X	X										
DU2-SU8	-112.17396	41.00191	11/20/2016			X			X								X	X										
DU2-SU8	-112.17396	40.99742	11/20/2016			X			X								X	X										
DU2-SU8	-112.17396	40.99293	11/20/2016			X			X								X	X										
DU2-SU8	-112.17396	40.98843	11/20/2016			X			X								X	X										
DU2-SU8	-112.17396	40.98394	11/20/2016			X		X								X												
DU2-SU8	-112.16803	41.01538	11/20/2016			X								X							X							
DU2-SU8	-112.16803	41.01089	11/20/2016			X							X	X				X										
DU2-SU8	-112.16803	41.00640	11/20/2016			X			X								X	X										
DU2-SU8	-112.16803	41.00191	11/20/2016			X							X	X			X	X										
DU2-SU8	-112.16803	40.99742	11/20/2016			X			X								X	X										
DU2-SU8	-112.16803	40.99293	11/20/2016			X			X								X	X										
DU2-SU8	-112.16803	40.98843	11/20/2016			X				X							X	X										
DU2-SU8	-112.16803	40.98394	11/20/2016			X			X								X	X										
DU2-SU8	-112.16210	41.00640	11/20/2016			X															X							
DU2-SU8	-112.16210	41.00191	11/20/2016			X			X									X										
DU2-SU8	-112.16210	40.99742	11/20/2016			X			X								X	X										
DU2-SU8	-112.16210	40.99293	11/20/2016			X			X								X	X										
DU2-SU8	-112.16210	40.98843	11/20/2016			X			X								X	X										
DU2-SU8	-112.16210	40.98394	11/20/2016			X			X								X	X										
DU2-SU8	-112.15617	41.00191	11/20/2016			X				X																		
DU2-SU8	-112.15617	40.99742	11/20/2016			X							X	X				X										
DU2-SU8	-112.15617	40.99293	11/20/2016			X			X					X			X	X										
DU2-SU8	-112.15617	40.98843	11/20/2016			X			X								X	X										
DU2-SU8	-112.15617	40.98394	11/20/2016			X			X								X	X										
DU2-SU8	-112.15024	40.98843	11/20/2016			X							X				X	X										
DU2-SU8	-112.15024	40.98394	11/20/2016			X			X								X	X										

Sample ID	Longitude	Latitude	Date	V	SV	NV	TC	MC	SC	NC	ETC	EMC	ESC	VF	COL	COM	COS	SA	B	SND	BM	EBM	BH	HAL	GYP	HEX	CIR	MR
DU2-SU9	-112.23327	41.05580	11/16/2016			X				X							X	X										
DU2-SU9	-112.23327	41.05131	11/16/2016			X				X							X	X										
DU2-SU9	-112.22734	41.05131	11/16/2016			X			X								X	X										
DU2-SU9	-112.22734	41.04682	11/16/2016	X																								
DU2-SU9	-112.22141	41.05131	11/16/2016			X			X							X		X										
DU2-SU9	-112.22141	41.04682	11/16/2016		X					X							X											
DU2-SU9	-112.21548	41.05131	11/16/2016			X			X																			
DU2-SU9	-112.21548	41.04682	11/16/2016			X			X								X	X										
DU2-SU9	-112.20954	41.04682	11/16/2016			X			X								X	X										
DU2-SU9	-112.20361	41.04233	11/16/2016	X																								
DU2-SU9	-112.19768	41.04233	11/16/2016			X			X								X	X										
DU2-SU9	-112.19768	41.03784	11/16/2016	X																								
DU2-SU9	-112.19175	41.04233	11/16/2016			X			X								X	X										
DU2-SU9	-112.19175	41.03784	11/16/2016		X					X							X	X										
DU2-SU9	-112.19175	41.03335	11/16/2016		X					X							X											
DU2-SU9	-112.19175	41.02886	11/16/2016		X					X				X			X											
DU2-SU9	-112.18582	41.03784	11/16/2016			X			X								X	X										
DU2-SU9	-112.18582	41.03335	11/16/2016			X			X								X	X										
DU2-SU9	-112.18582	41.02886	11/16/2016		X					X				X			X											
DU2-SU9	-112.18582	41.02436	11/16/2016			X			X								X											
DU2-SU9	-112.18582	41.01987	11/16/2016	X																								
DU2-SU9	-112.17989	41.03335	11/16/2016			X			X								X	X										
DU2-SU9	-112.17989	41.02886	11/16/2016			X			X								X	X										
DU2-SU9	-112.17989	41.02436	11/16/2016			X				X									X									
DU2-SU9	-112.17989	41.01987	11/16/2016			X				X																		
DU2-SU9	-112.17396	41.02886	11/16/2016			X			X								X		X									
DU2-SU9	-112.17396	41.02436	11/16/2016			X												X			X							
DU2-SU9	-112.17396	41.01987	11/16/2016			X			X								X	X										
DU2-SU9	-112.16802	41.01987	11/16/2016			X			X									X				X						

Sample ID	Longitude	Latitude	Date	V	SV	NV	TC	MC	SC	NC	ETC	EMC	ESC	VF	COL	COM	COS	SA	B	SND	BM	EBM	BH	HAL	GYP	HEX	CIR	MR
DU2-SU10	-112.27183	41.04233	11/26/2016		X					X				X										X				
DU2-SU10	-112.26886	41.04457	11/26/2016			X				X																		
DU2-SU10	-112.26886	41.04233	11/26/2016			X				X				X		X												
DU2-SU10	-112.26589	41.04457	11/26/2016			X				X				X		X												
DU2-SU10	-112.26589	41.04233	11/26/2016			X		X						X	X													
DU2-SU10	-112.26293	41.04682	11/26/2016			X							X	X														
DU2-SU10	-112.26293	41.04457	11/26/2016		X					X				X	X													
DU2-SU10	-112.26293	41.04233	11/26/2016		X					X				X	X													
DU2-SU10	-112.25996	41.04907	11/26/2016			X				X																		
DU2-SU10	-112.25996	41.04682	11/26/2016		X					X				X														
DU2-SU10	-112.25996	41.04457	11/26/2016		X					X					X													
DU2-SU10	-112.25996	41.04233	11/26/2016		X					X				X														
DU2-SU10	-112.25700	41.06029	11/26/2016			X		X									X	X										
DU2-SU10	-112.25700	41.05131	11/26/2016			X				X																		
DU2-SU10	-112.25700	41.04907	11/26/2016		X					X				X	X													
DU2-SU10	-112.25700	41.04682	11/26/2016			X				X				X	X			X										
DU2-SU10	-112.25403	41.06029	11/26/2016			X																						
DU2-SU10	-112.25403	41.05805	11/26/2016			X				X								X	X									
DU2-SU10	-112.25403	41.05580	11/26/2016			X		X									X											
DU2-SU10	-112.25403	41.05356	11/26/2016			X			X						X													
DU2-SU10	-112.25403	41.05131	11/26/2016			X				X				X														
DU2-SU10	-112.25403	41.04907	11/26/2016			X				X						X		X										
DU2-SU10	-112.25403	41.04682	11/26/2016			X			X									X										
DU2-SU10	-112.25106	41.06029	11/26/2016			X				X							X											
DU2-SU10	-112.25106	41.05580	11/26/2016			X			X							X												
DU2-SU10	-112.25106	41.05356	11/26/2016			X			X						X													
DU2-SU10	-112.25106	41.05131	11/26/2016			X				X				X	X													
DU2-SU10	-112.24810	41.06029	11/26/2016			X			X						X													
DU2-SU10	-112.24513	41.06029	11/26/2016			X	X								X		X											

Sample ID	Longitude	Latitude	Date	V	SV	NV	TC	MC	SC	NC	ETC	EMC	ESC	VF	COL	COM	COS	SA	B	SND	BM	EBM	BH	HAL	GYP	HEX	CIR	MR
DU2-SU11	-112.27479	41.02661	11/26/2016			X				X																		
DU2-SU11	-112.27183	41.03111	11/26/2016			X			X								X											
DU2-SU11	-112.27183	41.02886	11/26/2016			X		X							X									X				
DU2-SU11	-112.27183	41.02661	11/26/2016			X	X								X													
DU2-SU11	-112.27183	41.02436	11/26/2016			X				X						X												
DU2-SU11	-112.26886	41.02661	11/26/2016		X				X							X												
DU2-SU11	-112.26886	41.02436	11/26/2016			X			X							X												
DU2-SU11	-112.26886	41.02212	11/26/2016			X				X																		
DU2-SU11	-112.26589	41.02436	11/26/2016			X		X							X													
DU2-SU11	-112.26589	41.02212	11/26/2016			X				X																		
DU2-SU11	-112.26293	41.02436	11/26/2016			X			X																			
DU2-SU11	-112.26293	41.02212	11/26/2016			X			X																			
DU2-SU11	-112.26293	41.01987	11/26/2016			X				X																		
DU2-SU11	-112.25996	41.02436	11/26/2016			X			X								X											
DU2-SU11	-112.25996	41.02212	11/26/2016			X			X								X											
DU2-SU11	-112.25996	41.01987	11/26/2016			X			X									X										
DU2-SU11	-112.25700	41.02436	11/26/2016			X			X							X												
DU2-SU11	-112.25700	41.02212	11/26/2016			X			X								X											
DU2-SU11	-112.25700	41.01987	11/26/2016			X			X									X										
DU2-SU11	-112.25403	41.02436	11/26/2016			X			X								X											
DU2-SU11	-112.25403	41.02212	11/26/2016			X				X							X											
DU2-SU11	-112.25403	41.01987	11/26/2016			X			X									X										
DU2-SU11	-112.25106	41.02436	11/26/2016		X					X														X				
DU2-SU11	-112.25106	41.02212	11/26/2016			X				X							X											
DU2-SU11	-112.25106	41.01987	11/26/2016			X			X									X										
DU2-SU11	-112.24810	41.02212	11/26/2016			X			X									X										
DU2-SU11	-112.24810	41.01987	11/26/2016			X				X						X		X										
DU2-SU11	-112.24513	41.02212	11/26/2016			X				X								X										
DU2-SU11	-112.24513	41.01987	11/26/2016			X			X									X										
DU2-SU11	-112.24217	41.01987	11/26/2016	X																								

Sample ID	Longitude	Latitude	Date	V	SV	NV	TC	MC	SC	NC	ETC	EMC	ESC	VF	COL	COM	COS	SA	B	SND	BM	EBM	BH	HAL	GYP	HEX	CIR	MR
DU2-SU12	-112.25996	40.96822	2/16/2017			X				X													X					
DU2-SU12	-112.25996	40.96373	2/16/2017			X				X																		
DU2-SU12	-112.25996	40.95924	2/16/2017			X				X													X					
DU2-SU12	-112.25996	40.95026	2/16/2017			X				X																		
DU2-SU12	-112.25700	41.01538	2/16/2017			X				X									X									
DU2-SU12	-112.25700	40.98843	2/16/2017			X				X																		
DU2-SU12	-112.25700	40.98394	2/16/2017			X		X								X							X					
DU2-SU12	-112.25700	40.97945	2/16/2017			X			X																			
DU2-SU12	-112.25700	40.97496	2/16/2017			X		X							X													
DU2-SU12	-112.25700	40.97047	2/16/2017			X			X										X									
DU2-SU12	-112.25700	40.96598	2/16/2017			X			X							X	X											
DU2-SU12	-112.25700	40.96148	2/16/2017		X				X							X												
DU2-SU12	-112.25700	40.95699	2/16/2017			X				X									X									
DU2-SU12	-112.25700	40.95250	2/16/2017			X		X								X												
DU2-SU12	-112.25700	40.94801	2/16/2017			X			X																			
DU2-SU12	-112.25403	41.01314	2/16/2017			X			X										X									
DU2-SU12	-112.25403	40.99966	2/16/2017			X	X								X				X									
DU2-SU12	-112.25403	40.99517	2/16/2017			X		X							X													
DU2-SU12	-112.25403	40.99068	2/16/2017			X				X						X												
DU2-SU12	-112.25403	40.98619	2/16/2017			X				X						X												
DU2-SU12	-112.25403	40.98170	2/16/2017			X				X																		
DU2-SU12	-112.25403	40.97720	2/16/2017			X			X							X												
DU2-SU12	-112.25403	40.97271	2/16/2017			X				X							X											
DU2-SU12	-112.25403	40.96822	2/16/2017			X			X								X											
DU2-SU12	-112.25403	40.95475	2/16/2017			X				X						X												
DU2-SU12	-112.25403	40.95026	2/16/2017			X				X									X									
DU2-SU12	-112.25106	41.01538	2/16/2017			X			X																			
DU2-SU12	-112.25106	41.01089	2/16/2017			X			X																			
DU2-SU12	-112.25106	41.00640	2/16/2017			X			X					X														
DU2-SU12	-112.25106	41.00191	2/16/2017			X				X										X								
DU2-SU12	-112.25106	40.99742	2/16/2017			X				X																		
DU2-SU12	-112.25106	40.98843	2/16/2017			X			X							X												
DU2-SU12	-112.25106	40.98394	2/16/2017			X				X																		
DU2-SU12	-112.25106	40.97945	2/16/2017			X				X						X												
DU2-SU12	-112.25106	40.97496	2/16/2017		X				X							X												
DU2-SU12	-112.25106	40.97047	2/16/2017			X				X							X											
DU2-SU12	-112.24810	41.01314	2/16/2017			X			X																			
DU2-SU12	-112.24810	41.00864	2/16/2017			X			X																			
DU2-SU12	-112.24810	41.00415	2/16/2017			X			X							X												
DU2-SU12	-112.24810	40.99968	2/16/2017			X			X																			
DU2-SU12	-112.24810	40.99742	2/16/2017			X				X																		
DU2-SU12	-112.24513	41.01538	2/16/2017			X				X																		
DU2-SU12	-112.24513	41.01089	2/16/2017			X			X																			
DU2-SU12	-112.24513	41.00640	2/16/2017			X				X																		
DU2-SU12	-112.24513	41.00191	2/16/2017			X				X																		
DU2-SU12	-112.24217	41.00864	2/16/2017			X				X																		
DU2-SU12	-112.24217	41.00415	2/16/2017			X				X																		

Sample ID	Longitude	Latitude	Date	V	SV	NV	TC	MC	SC	NC	ETC	EMC	ESC	VF	COL	COM	COS	SA	B	SND	BM	EBM	BH	HAL	GYP	HEX	CIR	MR
DU2-SU13	-112.25403	40.94127	3/5/2017			X						X				X												
DU2-SU13	-112.25106	40.93903	3/5/2017			X			X							X												
DU2-SU13	-112.24810	40.93454	3/5/2017			X			X								X											
DU2-SU13	-112.24217	40.93229	3/5/2017			X				X									X									
DU2-SU13	-112.23920	40.93005	3/5/2017			X				X																		
DU2-SU13	-112.23920	40.92555	3/5/2017			X			X										X									
DU2-SU13	-112.23624	40.92331	3/5/2017			X			X									X	X									
DU2-SU13	-112.23327	40.92106	3/5/2017			X			X									X	X									
DU2-SU13	-112.23327	40.91657	3/5/2017			X			X								X	X										
DU2-SU13	-112.23327	40.91208	3/5/2017			X						X						X										
DU2-SU13	-112.23030	40.91882	3/5/2017			X			X									X										
DU2-SU13	-112.23030	40.91433	3/5/2017			X			X								X			X								
DU2-SU13	-112.23030	40.90983	3/5/2017			X						X				X												
DU2-SU13	-112.23030	40.90534	3/5/2017			X			X								X											
DU2-SU13	-112.22734	40.91208	3/5/2017		X					X																		
DU2-SU13	-112.22734	40.90759	3/5/2017			X			X									X										
DU2-SU13	-112.22734	40.90310	3/5/2017			X			X									X										
DU2-SU13	-112.22437	40.89636	3/5/2017			X				X																		
DU2-SU13	-112.22141	40.89411	3/5/2017			X						X																
DU2-SU13	-112.22141	40.88962	3/5/2017			X							X			X												
DU2-SU13	-112.21844	40.88738	3/5/2017		X					X										X								
DU2-SU13	-112.21548	40.88064	3/5/2017			X			X																			
DU2-SU13	-112.21548	40.87839	3/5/2017			X			X								X											
DU2-SU13	-112.21251	40.87615	3/5/2017			X			X									X	X									

Sample ID	Longitude	Latitude	Date	V	SV	NV	TC	MC	SC	NC	ETC	EMC	ESC	VF	COL	COM	COS	SA	B	SND	BM	EBM	BH	HAL	GYP	HEX	CIR	MR
DU2-SU14	-112.22141	40.86747	3/3/2017			X				X				X		X	X											
DU2-SU14	-112.21548	40.86267	3/3/2017		X					X				X														
DU2-SU14	-112.20954	40.87166	3/3/2017			X			X										X									
DU2-SU14	-112.20954	40.86747	3/3/2017			X						X																
DU2-SU14	-112.20954	40.86267	3/3/2017			X						X																
DU2-SU14	-112.20954	40.85818	3/3/2017			X	X								X	X												
DU2-SU14	-112.20361	40.86747	3/3/2017		X					X							X											
DU2-SU14	-112.20361	40.86267	3/3/2017		X					X				X														
DU2-SU14	-112.20361	40.85818	3/3/2017			X				X								X										
DU2-SU14	-112.19768	40.86267	3/3/2017		X					X						X												
DU2-SU14	-112.19768	40.85818	3/3/2017			X				X								X										
DU2-SU14	-112.19175	40.85818	3/3/2017			X				X																		
DU2-SU14	-112.19175	40.85369	3/3/2017			X				X																		
DU2-SU14	-112.19175	40.84920	3/3/2017			X						X																
DU2-SU14	-112.19175	40.84471	3/3/2017			X					X																	
DU2-SU14	-112.18582	40.84920	3/3/2017			X			X									X										
DU2-SU14	-112.18582	40.84471	3/3/2017			X						X																
DU2-SU14	-112.18582	40.84022	3/3/2017			X						X																
DU2-SU14	-112.17989	40.84471	3/3/2017			X		X																				
DU2-SU14	-112.17989	40.84022	3/3/2017			X						X																
DU2-SU14	-112.17396	40.84471	3/3/2017			X				X						X												
DU2-SU14	-112.17396	40.84022	3/3/2017			X						X																

Sample ID	Longitude	Latitude	Date	V	SV	NV	TC	MC	SC	NC	ETC	EMC	ESC	VF	COL	COM	COS	SA	B	SND	BM	EBM	BH	HAL	GYP	HEX	CIR	MR
DU3-SU1	-112.08435	40.94352	7/23/2016			X							X	X														
DU3-SU1	-112.08435	40.93903	7/23/2016			X							X	X														
DU3-SU1	-112.08435	40.93454	7/23/2016		X								X	X														
DU3-SU1	-112.08435	40.93005	7/23/2016			X							X	X														
DU3-SU1	-112.07842	40.94352	7/23/2016		X								X	X														
DU3-SU1	-112.07842	40.93903	7/23/2016		X								X	X														
DU3-SU1	-112.07842	40.93454	7/23/2016			X			X									X										
DU3-SU1	-112.07842	40.93005	7/23/2016		X								X	X														
DU3-SU1	-112.07842	40.92555	7/23/2016		X								X	X														
DU3-SU1	-112.07842	40.92106	7/23/2016			X							X	X														
DU3-SU1	-112.07842	40.91657	7/23/2016		X								X	X														
DU3-SU1	-112.07249	40.94352	7/23/2016			X			X									X										
DU3-SU1	-112.07249	40.93903	7/23/2016			X							X	X														
DU3-SU1	-112.07249	40.93454	7/23/2016			X			X									X										
DU3-SU1	-112.07249	40.93005	7/23/2016			X			X									X										
DU3-SU1	-112.07249	40.92555	7/23/2016			X							X	X														
DU3-SU1	-112.07249	40.92106	7/23/2016			X							X	X														
DU3-SU1	-112.07249	40.91657	7/23/2016		X				X									X										
DU3-SU1	-112.06656	40.94352	7/23/2016			X			X									X										
DU3-SU1	-112.06656	40.93903	7/23/2016			X							X					X										
DU3-SU1	-112.06656	40.93454	7/23/2016			X			X									X										
DU3-SU1	-112.06656	40.93005	7/23/2016			X							X	X														
DU3-SU1	-112.06656	40.92555	7/23/2016			X			X									X										
DU3-SU1	-112.06656	40.92106	7/23/2016			X			X									X										
DU3-SU1	-112.06656	40.91657	7/23/2016		X				X									X										
DU3-SU1	-112.06063	40.94352	7/23/2016			X			X									X										
DU3-SU1	-112.06063	40.93903	7/23/2016			X			X									X										
DU3-SU1	-112.06063	40.93454	7/23/2016			X			X								X	X										
DU3-SU1	-112.06063	40.93005	7/23/2016			X							X	X														
DU3-SU1	-112.06063	40.92555	7/23/2016			X			X									X										
DU3-SU1	-112.06063	40.92106	7/23/2016			X			X									X										
DU3-SU1	-112.06063	40.91657	7/23/2016			X							X	X														
DU3-SU1	-112.05470	40.94352	7/23/2016			X			X									X										
DU3-SU1	-112.05470	40.93903	7/23/2016			X			X									X										
DU3-SU1	-112.05470	40.93454	7/23/2016			X			X									X										
DU3-SU1	-112.05470	40.93005	7/23/2016			X							X	X														
DU3-SU1	-112.05470	40.92555	7/23/2016			X			X									X										
DU3-SU1	-112.05470	40.92106	7/23/2016			X			X								X	X										
DU3-SU1	-112.05470	40.91657	7/23/2016		X								X	X														
DU3-SU1	-112.04877	40.94352	7/23/2016			X			X									X										
DU3-SU1	-112.04877	40.93903	7/23/2016			X			X									X										
DU3-SU1	-112.04877	40.93454	7/23/2016			X			X									X										
DU3-SU1	-112.04877	40.93005	7/23/2016			X			X									X										
DU3-SU1	-112.04877	40.92555	7/23/2016			X			X								X	X										
DU3-SU1	-112.04877	40.92106	7/23/2016			X							X	X														
DU3-SU1	-112.04284	40.94352	7/23/2016			X			X									X										
DU3-SU1	-112.04284	40.93903	7/23/2016			X			X									X										
DU3-SU1	-112.04284	40.93454	7/23/2016			X							X	X														
DU3-SU1	-112.04284	40.93005	7/23/2016			X			X									X										
DU3-SU1	-112.04284	40.92555	7/23/2016			X			X								X	X										
DU3-SU1	-112.04284	40.92106	7/23/2016		X				X									X										
DU3-SU1	-112.03691	40.94352	7/23/2016			X			X									X										
DU3-SU1	-112.03691	40.93903	7/23/2016			X			X									X										
DU3-SU1	-112.03691	40.93454	7/23/2016			X			X									X										
DU3-SU1	-112.03691	40.93005	7/23/2016			X			X									X										
DU3-SU1	-112.03691	40.92555	7/23/2016			X			X									X										
DU3-SU1	-112.03098	40.94352	7/23/2016			X			X									X										
DU3-SU1	-112.03098	40.93903	7/23/2016			X			X									X										
DU3-SU1	-112.03098	40.93454	7/23/2016			X			X									X										
DU3-SU1	-112.03098	40.93005	7/23/2016			X			X								X	X										
DU3-SU1	-112.03098	40.92555	7/23/2016			X							X	X														

Sample ID	Longitude	Latitude	Date	V	SV	NV	TC	MC	SC	NC	ETC	EMC	ESC	VF	COL	COM	COS	SA	B	SND	BM	EBM	BH	HAL	GYP	HEX	CIR	MR
DU3-SU2	-112.06656	40.97945	7/25/2016			X			X									X										
DU3-SU2	-112.06656	40.97496	7/25/2016			X			X								X	X										
DU3-SU2	-112.06656	40.97047	7/25/2016			X			X				X	X				X										
DU3-SU2	-112.06656	40.96598	7/25/2016			X			X									X										
DU3-SU2	-112.06656	40.96149	7/25/2016			X			X									X										
DU3-SU2	-112.06656	40.95700	7/25/2016			X			X								X	X										
DU3-SU2	-112.06656	40.95250	7/25/2016			X			X								X	X										
DU3-SU2	-112.06656	40.94801	7/25/2016			X			X								X	X										
DU3-SU2	-112.06063	40.97945	7/25/2016			X			X								X	X										
DU3-SU2	-112.06063	40.97496	7/25/2016			X			X								X	X										
DU3-SU2	-112.06063	40.97047	7/25/2016			X			X									X										
DU3-SU2	-112.06063	40.96598	7/25/2016			X			X									X										
DU3-SU2	-112.06063	40.96149	7/25/2016			X			X									X										
DU3-SU2	-112.06063	40.95700	7/25/2016			X			X								X	X										
DU3-SU2	-112.06063	40.95250	7/25/2016			X			X								X	X										
DU3-SU2	-112.06063	40.94801	7/25/2016			X			X								X	X										
DU3-SU2	-112.05470	40.97945	7/25/2016			X			X									X										
DU3-SU2	-112.05470	40.97496	7/25/2016			X			X									X										
DU3-SU2	-112.05470	40.97047	7/25/2016			X			X									X										
DU3-SU2	-112.05470	40.96598	7/25/2016			X			X									X										
DU3-SU2	-112.05470	40.96149	7/25/2016			X			X									X										
DU3-SU2	-112.05470	40.95700	7/25/2016			X			X									X										
DU3-SU2	-112.05470	40.95250	7/25/2016			X			X									X										
DU3-SU2	-112.05470	40.94801	7/25/2016			X			X									X										
DU3-SU2	-112.04877	40.97945	7/25/2016			X			X								X	X										
DU3-SU2	-112.04877	40.97496	7/25/2016			X			X								X	X										
DU3-SU2	-112.04877	40.97047	7/25/2016			X			X									X										
DU3-SU2	-112.04877	40.96598	7/25/2016			X			X									X										
DU3-SU2	-112.04877	40.96149	7/25/2016			X			X									X										
DU3-SU2	-112.04877	40.95700	7/25/2016			X			X									X										
DU3-SU2	-112.04877	40.95250	7/25/2016			X			X									X										
DU3-SU2	-112.04877	40.94801	7/25/2016			X			X									X										
DU3-SU2	-112.04284	40.97945	7/25/2016			X			X								X	X										
DU3-SU2	-112.04284	40.97496	7/25/2016			X			X								X	X										
DU3-SU2	-112.04284	40.97047	7/25/2016			X			X									X										
DU3-SU2	-112.04284	40.96598	7/25/2016			X			X									X										
DU3-SU2	-112.04284	40.96149	7/25/2016			X			X									X										
DU3-SU2	-112.04284	40.95700	7/25/2016			X			X									X										
DU3-SU2	-112.04284	40.95250	7/25/2016			X			X									X										
DU3-SU2	-112.04284	40.94801	7/25/2016			X			X									X										
DU3-SU2	-112.03691	40.97945	7/25/2016			X			X								X	X										
DU3-SU2	-112.03691	40.97496	7/25/2016			X			X								X	X										
DU3-SU2	-112.03691	40.97047	7/25/2016			X			X									X										
DU3-SU2	-112.03691	40.96598	7/25/2016			X			X									X										
DU3-SU2	-112.03691	40.96149	7/25/2016			X			X									X										
DU3-SU2	-112.03691	40.95700	7/25/2016			X			X									X										
DU3-SU2	-112.03691	40.95250	7/25/2016			X			X									X										
DU3-SU2	-112.03691	40.94801	7/25/2016			X			X									X										
DU3-SU2	-112.03098	40.97945	7/25/2016			X			X								X	X										
DU3-SU2	-112.03098	40.97496	7/25/2016			X			X								X	X										
DU3-SU2	-112.03098	40.97047	7/25/2016			X			X									X										
DU3-SU2	-112.03098	40.96598	7/25/2016			X			X									X										
DU3-SU2	-112.03098	40.96149	7/25/2016			X			X									X										
DU3-SU2	-112.03098	40.95700	7/25/2016			X			X									X										
DU3-SU2	-112.03098	40.95250	7/25/2016			X			X				X	X				X										
DU3-SU2	-112.03098	40.94801	7/25/2016			X			X									X										
DU3-SU2	-112.02505	40.97945	7/25/2016			X			X								X	X										
DU3-SU2	-112.02505	40.97496	7/25/2016			X			X								X	X										
DU3-SU2	-112.02505	40.97047	7/25/2016			X			X									X										
DU3-SU2	-112.02505	40.96598	7/25/2016			X			X									X										
DU3-SU2	-112.02505	40.96149	7/25/2016			X			X									X										
DU3-SU2	-112.02505	40.95700	7/25/2016			X			X				X	X				X										
DU3-SU2	-112.02505	40.95250	7/25/2016			X			X									X										
DU3-SU2	-112.02505	40.94801	7/25/2016			X			X									X										

Sample ID	Longitude	Latitude	Date	V	SV	NV	TC	MC	SC	NC	ETC	EMC	ESC	VF	COL	COM	COS	SA	B	SND	BM	EBM	BH	HAL	GYP	HEX	CIR	MR
DU3-SU3	-112.09029	40.97945	6/17/2017			X			X																			
DU3-SU3	-112.09029	40.97496	6/17/2017			X			X																			
DU3-SU3	-112.08435	40.97945	6/17/2017			X							X	X														
DU3-SU3	-112.08435	40.97496	6/17/2017			X							X	X														
DU3-SU3	-112.08435	40.97047	6/17/2017			X			X																			
DU3-SU3	-112.07842	40.97945	6/17/2017			X							X	X														
DU3-SU3	-112.07842	40.97496	6/17/2017			X			X																			
DU3-SU3	-112.07842	40.97047	6/17/2017			X			X																			
DU3-SU3	-112.07842	40.96598	6/17/2017			X			X																			
DU3-SU3	-112.07842	40.96148	6/17/2017		X				X																			
DU3-SU3	-112.07249	40.97945	6/17/2017			X			X																			
DU3-SU3	-112.07249	40.97496	6/17/2017			X			X					X														
DU3-SU3	-112.07249	40.97047	6/17/2017			X							X	X														
DU3-SU3	-112.07249	40.96598	6/17/2017			X							X	X														
DU3-SU3	-112.07249	40.96148	6/17/2017			X							X	X														
DU3-SU3	-112.07249	40.95699	6/17/2017			X							X	X														
DU3-SU3	-112.07249	40.95250	6/17/2017		X				X																			

Sample ID	Longitude	Latitude	Date	V	SV	NV	TC	MC	SC	NC	ETC	EMC	ESC	VF	COL	COM	COS	SA	B	SND	BM	EBM	BH	HAL	GYP	HEX	CIR	MR
DU3-SU4	-112.02504	40.94352	8/18/2017			X							X	X				X										
DU3-SU4	-112.02504	40.93903	8/18/2017			X			X									X										
DU3-SU4	-112.02504	40.93454	8/18/2017			X			X									X										
DU3-SU4	-112.02504	40.93005	8/18/2017		X								X	X														
DU3-SU4	-112.01911	40.97945	8/18/2017			X			X									X										
DU3-SU4	-112.01911	40.97496	8/18/2017			X			X																			
DU3-SU4	-112.01911	40.97047	8/18/2017			X			X																			
DU3-SU4	-112.01911	40.96598	8/18/2017			X			X									X										
DU3-SU4	-112.01911	40.96149	8/18/2017			X							X	X				X										
DU3-SU4	-112.01911	40.95700	8/18/2017			X						X		X														
DU3-SU4	-112.01911	40.95250	8/18/2017			X							X	X				X										
DU3-SU4	-112.01911	40.94801	8/18/2017			X					X			X												X		
DU3-SU4	-112.01911	40.94352	8/18/2017			X							X															
DU3-SU4	-112.01911	40.93903	8/18/2017			X			X									X										
DU3-SU4	-112.01911	40.93454	8/18/2017		X				X																			
DU3-SU4	-112.01318	40.97945	8/18/2017			X			X									X										
DU3-SU4	-112.01318	40.97496	8/18/2017			X			X									X										
DU3-SU4	-112.01318	40.97047	8/18/2017			X							X	X														
DU3-SU4	-112.01318	40.96598	8/18/2017			X			X									X										
DU3-SU4	-112.01318	40.96149	8/18/2017			X							X	X				X										
DU3-SU4	-112.01318	40.95700	8/18/2017		X							X		X														
DU3-SU4	-112.01318	40.95250	8/18/2017		X						X			X												X		
DU3-SU4	-112.01318	40.94801	8/18/2017		X							X		X												X		
DU3-SU4	-112.01318	40.94352	8/18/2017			X			X																			
DU3-SU4	-112.00725	40.97945	8/18/2017			X			X									X										
DU3-SU4	-112.00725	40.97496	8/18/2017			X			X									X										
DU3-SU4	-112.00725	40.97047	8/18/2017			X							X	X														
DU3-SU4	-112.00725	40.96598	8/18/2017			X							X	X														
DU3-SU4	-112.00725	40.96149	8/18/2017		X								X	X														
DU3-SU4	-112.00725	40.95700	8/18/2017		X								X	X														
DU3-SU4	-112.00725	40.95250	8/18/2017		X		X																			X		
DU3-SU4	-112.00725	40.94801	8/18/2017		X				X																			
DU3-SU4	-112.00131	40.97945	8/18/2017			X			X									X										
DU3-SU4	-112.00131	40.97496	8/18/2017		X								X	X														
DU3-SU4	-112.00131	40.97047	8/18/2017		X								X	X														
DU3-SU4	-112.00131	40.96598	8/18/2017		X								X	X														
DU3-SU4	-112.00131	40.96149	8/18/2017		X								X	X														
DU3-SU4	-112.00131	40.95700	8/18/2017		X								X	X														
DU3-SU4	-112.00131	40.95250	8/18/2017		X						X			X												X		
DU3-SU4	-112.00131	40.94801	8/18/2017	X							X			X												X		
DU3-SU4	-111.99538	40.97945	8/18/2017		X								X	X														
DU3-SU4	-111.99538	40.97496	8/18/2017		X								X	X														
DU3-SU4	-111.99538	40.97047	8/18/2017		X								X	X														
DU3-SU4	-111.99538	40.96598	8/18/2017		X								X	X														
DU3-SU4	-111.99538	40.96149	8/18/2017		X								X	X														
DU3-SU4	-111.99538	40.95700	8/18/2017		X						X			X												X		
DU3-SU4	-111.99538	40.95250	8/18/2017		X						X			X												X		
DU3-SU4	-111.98945	40.97945	8/18/2017		X								X	X														
DU3-SU4	-111.98945	40.97496	8/18/2017		X								X	X														
DU3-SU4	-111.98945	40.97047	8/18/2017		X								X	X														
DU3-SU4	-111.98945	40.96598	8/18/2017		X							X		X														
DU3-SU4	-111.98945	40.96149	8/18/2017		X						X			X												X		
DU3-SU4	-111.98945	40.95700	8/18/2017			X					X			X												X		
DU3-SU4	-111.98352	40.97945	8/18/2017		X						X			X														
DU3-SU4	-111.98352	40.97496	8/18/2017		X						X			X												X		
DU3-SU4	-111.98352	40.97047	8/18/2017		X						X			X												X		
DU3-SU4	-111.98352	40.96598	8/18/2017		X						X			X												X		
DU3-SU4	-111.98352	40.96149	8/18/2017	X							X			X												X		
DU3-SU4	-111.97759	40.97945	8/18/2017		X						X			X												X		
DU3-SU4	-111.97759	40.97496	8/18/2017			X					X			X												X		

Sample ID	Longitude	Latitude	Date	V	SV	NV	TC	MC	SC	NC	ETC	EMC	ESC	VF	COL	COM	COS	SA	B	SND	BM	EBM	BH	HAL	GYP	HEX	CIR	MR
DU3-SU5	-112.01911	41.00640	8/24/2017		X							X		X														
DU3-SU5	-112.01911	41.00191	8/24/2017			X							X	X														
DU3-SU5	-112.01911	40.99742	8/24/2017		X								X	X														
DU3-SU5	-112.01911	40.99293	8/24/2017			X							X	X														
DU3-SU5	-112.01911	40.98844	8/24/2017			X			X					X														
DU3-SU5	-112.01911	40.98395	8/24/2017			X		X																				
DU3-SU5	-112.01318	41.00640	8/24/2017		X						X			X														
DU3-SU5	-112.01318	41.00191	8/24/2017		X								X	X														
DU3-SU5	-112.01318	40.99742	8/24/2017		X								X	X														
DU3-SU5	-112.01318	40.99293	8/24/2017		X								X	X														
DU3-SU5	-112.01318	40.98844	8/24/2017			X							X	X														
DU3-SU5	-112.01318	40.98395	8/24/2017			X							X	X														
DU3-SU5	-112.00725	41.00640	8/24/2017		X						X			X														
DU3-SU5	-112.00725	41.00191	8/24/2017		X						X			X														
DU3-SU5	-112.00725	40.99742	8/24/2017		X								X	X														
DU3-SU5	-112.00725	40.99293	8/24/2017		X								X	X														
DU3-SU5	-112.00725	40.98844	8/24/2017		X								X	X														
DU3-SU5	-112.00725	40.98395	8/24/2017		X							X		X														
DU3-SU5	-112.00132	41.00640	8/24/2017		X						X			X														
DU3-SU5	-112.00132	41.00191	8/24/2017		X							X		X														
DU3-SU5	-112.00132	40.99742	8/24/2017		X						X			X												X		
DU3-SU5	-112.00132	40.99293	8/24/2017		X								X	X														
DU3-SU5	-112.00132	40.98844	8/24/2017		X								X	X														
DU3-SU5	-112.00132	40.98395	8/24/2017		X			X						X														
DU3-SU5	-111.99539	41.00191	8/24/2017		X								X	X														
DU3-SU5	-111.99539	40.99742	8/24/2017		X								X	X														
DU3-SU5	-111.99539	40.99293	8/24/2017		X						X			X												X		
DU3-SU5	-111.99539	40.98844	8/24/2017		X								X	X														
DU3-SU5	-111.99539	40.98395	8/24/2017		X								X	X														
DU3-SU5	-111.98946	40.99742	8/24/2017		X						X			X														
DU3-SU5	-111.98946	40.99293	8/24/2017		X								X	X														
DU3-SU5	-111.98946	40.98844	8/24/2017		X						X			X												X		
DU3-SU5	-111.98946	40.98395	8/24/2017		X							X		X														
DU3-SU5	-111.98353	40.98844	8/24/2017		X							X		X														
DU3-SU5	-111.98353	40.98395	8/24/2017		X								X	X														

Sample ID	Longitude	Latitude	Date	V	SV	NV	TC	MC	SC	NC	ETC	EMC	ESC	VF	COL	COM	COS	SA	B	SND	BM	EBM	BH	HAL	GYP	HEX	CIR	MR
DU3-SU6	-112.06656	41.00640	8/26/2017		X							X		X														
DU3-SU6	-112.06656	41.00191	8/26/2017		X								X	X														
DU3-SU6	-112.06656	40.99742	8/26/2017		X						X			X														
DU3-SU6	-112.06656	40.99293	8/26/2017			X			X					X			X											
DU3-SU6	-112.06656	40.98844	8/26/2017			X	X										X											
DU3-SU6	-112.06656	40.98395	8/26/2017			X			X									X										
DU3-SU6	-112.06063	41.00640	8/26/2017		X						X			X														
DU3-SU6	-112.06063	41.00191	8/26/2017		X							X		X														
DU3-SU6	-112.06063	40.99742	8/26/2017		X								X	X														
DU3-SU6	-112.06063	40.99293	8/26/2017			X							X	X														
DU3-SU6	-112.06063	40.98844	8/26/2017			X							X	X														
DU3-SU6	-112.06063	40.98395	8/26/2017			X			X									X										
DU3-SU6	-112.05470	41.00640	8/26/2017		X						X			X												X		
DU3-SU6	-112.05470	41.00191	8/26/2017		X								X	X														
DU3-SU6	-112.05470	40.99742	8/26/2017		X								X	X														
DU3-SU6	-112.05470	40.99293	8/26/2017			X							X	X														
DU3-SU6	-112.05470	40.98844	8/26/2017			X							X	X														
DU3-SU6	-112.05470	40.98395	8/26/2017			X							X	X														
DU3-SU6	-112.04877	41.00640	8/26/2017		X						X			X														
DU3-SU6	-112.04877	41.00191	8/26/2017		X								X	X														
DU3-SU6	-112.04877	40.99742	8/26/2017		X							X		X														
DU3-SU6	-112.04877	40.99293	8/26/2017			X							X	X														
DU3-SU6	-112.04877	40.98844	8/26/2017			X						X		X														
DU3-SU6	-112.04877	40.98395	8/26/2017			X	X																					
DU3-SU6	-112.04284	41.00640	8/26/2017		X								X	X														
DU3-SU6	-112.04284	41.00191	8/26/2017		X						X			X														
DU3-SU6	-112.04284	40.99742	8/26/2017		X						X			X														
DU3-SU6	-112.04284	40.99293	8/26/2017			X							X	X														
DU3-SU6	-112.04284	40.98844	8/26/2017			X							X	X														
DU3-SU6	-112.04284	40.98395	8/26/2017			X			X									X										
DU3-SU6	-112.03691	41.00640	8/26/2017		X								X	X														
DU3-SU6	-112.03691	41.00191	8/26/2017		X								X	X														
DU3-SU6	-112.03691	40.99742	8/26/2017		X							X		X														
DU3-SU6	-112.03691	40.99293	8/26/2017			X							X	X														
DU3-SU6	-112.03691	40.98844	8/26/2017			X						X		X														
DU3-SU6	-112.03691	40.98395	8/26/2017			X			X									X										
DU3-SU6	-112.03098	41.00640	8/26/2017		X								X	X														
DU3-SU6	-112.03098	41.00191	8/26/2017		X								X	X														
DU3-SU6	-112.03098	40.99742	8/26/2017		X								X	X														
DU3-SU6	-112.03098	40.99293	8/26/2017			X			X					X														
DU3-SU6	-112.03098	40.98844	8/26/2017			X							X	X														
DU3-SU6	-112.03098	40.98395	8/26/2017			X			X									X										
DU3-SU6	-112.02505	41.00640	8/26/2017		X						X			X														
DU3-SU6	-112.02505	41.00191	8/26/2017		X							X		X												X		
DU3-SU6	-112.02505	40.99742	8/26/2017		X								X	X														
DU3-SU6	-112.02505	40.99293	8/26/2017			X							X	X														
DU3-SU6	-112.02505	40.98844	8/26/2017			X							X	X														
DU3-SU6	-112.02505	40.98395	8/26/2017			X		X						X				X										

Sample ID	Longitude	Latitude	Date	V	SV	NV	TC	MC	SC	NC	ETC	EMC	ESC	VF	COL	COM	COS	SA	B	SND	BM	EBM	BH	HAL	GYP	HEX	CIR	MR
DU3-SU7	-112.10215	41.01538	6/17/2017		X			X										X								X		
DU3-SU7	-112.10215	41.01089	6/17/2017			X			X																	X		
DU3-SU7	-112.09622	41.01538	6/17/2017		X		X							X												X		
DU3-SU7	-112.09622	41.01089	6/17/2017			X					X			X												X		
DU3-SU7	-112.09622	41.00640	6/17/2017		X						X			X												X		
DU3-SU7	-112.09622	41.00191	6/17/2017			X					X			X												X		
DU3-SU7	-112.09029	41.01538	6/17/2017		X			X						X												X		
DU3-SU7	-112.09029	41.01089	6/17/2017		X		X							X												X		
DU3-SU7	-112.09029	41.00640	6/17/2017		X		X							X												X		
DU3-SU7	-112.09029	41.00191	6/17/2017			X	X							X												X		
DU3-SU7	-112.09029	40.99742	6/17/2017			X					X															X		
DU3-SU7	-112.09029	40.99293	6/17/2017			X							X	X				X										
DU3-SU7	-112.09029	40.98843	6/17/2017			X							X	X				X										
DU3-SU7	-112.09029	40.98394	6/17/2017			X			X									X										
DU3-SU7	-112.08436	41.01538	6/17/2017		X		X							X												X		
DU3-SU7	-112.08436	41.01089	6/17/2017		X		X							X												X		
DU3-SU7	-112.08436	41.00640	6/17/2017		X		X							X												X		
DU3-SU7	-112.08436	41.00191	6/17/2017			X	X							X												X		
DU3-SU7	-112.08436	40.99742	6/17/2017			X							X	X				X								X		
DU3-SU7	-112.08436	40.99293	6/17/2017			X							X	X				X										
DU3-SU7	-112.08436	40.98843	6/17/2017			X							X	X				X										
DU3-SU7	-112.08436	40.98394	6/17/2017			X							X	X				X										
DU3-SU7	-112.07843	41.00640	6/17/2017		X		X							X												X		
DU3-SU7	-112.07843	41.00191	6/17/2017		X		X							X												X		
DU3-SU7	-112.07843	40.99742	6/17/2017		X								X	X												X		
DU3-SU7	-112.07843	40.99293	6/17/2017		X								X	X				X										
DU3-SU7	-112.07843	40.98843	6/17/2017			X							X	X				X										
DU3-SU7	-112.07843	40.98394	6/17/2017			X			X								X	X										
DU3-SU7	-112.07250	41.00640	6/17/2017		X		X							X												X		
DU3-SU7	-112.07250	41.00191	6/17/2017			X	X							X												X		
DU3-SU7	-112.07250	40.99742	6/17/2017	X			X							X												X		
DU3-SU7	-112.07250	40.99293	6/17/2017		X								X	X				X										
DU3-SU7	-112.07250	40.98843	6/17/2017			X							X	X				X										
DU3-SU7	-112.07250	40.98394	6/17/2017			X			X								X	X										

Sample ID	Longitude	Latitude	Date	V	SV	NV	TC	MC	SC	NC	ETC	EMC	ESC	VF	COL	COM	COS	SA	B	SND	BM	EBM	BH	HAL	GYP	HEX	CIR	MR
DU3-SU8	-112.11401	41.05131	6/1/2017		X				X																	X		
DU3-SU8	-112.11401	41.04682	6/1/2017			X			X																	X		
DU3-SU8	-112.11401	41.04233	6/1/2017			X			X																	X		
DU3-SU8	-112.11401	41.03784	6/1/2017			X			X																	X		
DU3-SU8	-112.11401	41.03335	6/1/2017			X	X														X					X		
DU3-SU8	-112.10808	41.05131	6/1/2017		X				X																	X		
DU3-SU8	-112.10808	41.04682	6/1/2017			X			X																	X		
DU3-SU8	-112.10808	41.04233	6/1/2017			X			X																	X		
DU3-SU8	-112.10808	41.03784	6/1/2017			X		X																		X		
DU3-SU8	-112.10808	41.03335	6/1/2017		X		X																			X		
DU3-SU8	-112.10808	41.02886	6/1/2017		X		X							X												X		
DU3-SU8	-112.10808	41.02436	6/1/2017		X						X			X												X		
DU3-SU8	-112.10808	41.01987	6/1/2017		X		X							X												X		
DU3-SU8	-112.10215	41.05131	6/1/2017			X			X																	X		
DU3-SU8	-112.10215	41.04682	6/1/2017			X			X																	X		
DU3-SU8	-112.10215	41.04233	6/1/2017			X		X																		X		
DU3-SU8	-112.10215	41.03784	6/1/2017		X			X						X												X		
DU3-SU8	-112.10215	41.03335	6/1/2017		X		X							X												X		
DU3-SU8	-112.10215	41.02886	6/1/2017		X		X																			X		
DU3-SU8	-112.10215	41.02436	6/1/2017		X		X							X												X		
DU3-SU8	-112.10215	41.01987	6/1/2017		X		X							X												X		
DU3-SU8	-112.09622	41.04233	6/1/2017		X		X							X												X		
DU3-SU8	-112.09622	41.03784	6/1/2017		X		X							X												X		
DU3-SU8	-112.09622	41.03335	6/1/2017		X		X							X												X		
DU3-SU8	-112.09622	41.02886	6/1/2017		X		X																			X		
DU3-SU8	-112.09622	41.02436	6/1/2017		X		X							X												X		
DU3-SU8	-112.09622	41.01987	6/1/2017		X		X																			X		
DU3-SU8	-112.09029	41.03335	6/1/2017		X		X							X												X		
DU3-SU8	-112.09029	41.02886	6/1/2017		X				X																	X		
DU3-SU8	-112.09029	41.02436	6/1/2017		X			X																		X		
DU3-SU8	-112.09029	41.01987	6/1/2017		X		X																			X		
DU3-SU8	-112.08436	41.03335	6/1/2017		X				X																	X		
DU3-SU8	-112.08436	41.02886	6/1/2017		X		X							X												X		
DU3-SU8	-112.08436	41.02436	6/1/2017		X			X																		X		
DU3-SU8	-112.08436	41.01987	6/1/2017		X		X							X												X		

Sample ID	Longitude	Latitude	Date	V	SV	NV	TC	MC	SC	NC	ETC	EMC	ESC	VF	COL	COM	COS	SA	B	SND	BM	EBM	BH	HAL	GYP	HEX	CIR	MR
DU3-SU9	-112.13181	41.06479	6/1/2017		X		X																			X		
DU3-SU9	-112.13181	41.06029	6/1/2017		X				X										X							X		
DU3-SU9	-112.12587	41.06029	6/1/2017		X			X																		X		
DU3-SU9	-112.12587	41.05580	6/1/2017		X			X													X					X		
DU3-SU9	-112.12587	41.05131	6/1/2017		X					X																		
DU3-SU9	-112.11994	41.06928	6/1/2017		X			X						X														
DU3-SU9	-112.11994	41.05131	6/1/2017		X				X																	X		
DU3-SU9	-112.11994	41.04682	6/1/2017		X		X																			X		

Sample ID	Longitude	Latitude	Date	V	SV	NV	TC	MC	SC	NC	ETC	EMC	ESC	VF	COL	COM	COS	SA	B	SND	BM	EBM	BH	HAL	GYP	HEX	CIR	MR
DU3-SU10	-112.16740	41.08724	6/1/2017			X	X							X												X		
DU3-SU10	-112.16146	41.08724	6/1/2017			X			X									X										
DU3-SU10	-112.16146	41.08275	6/2/2017			X			X										X									
DU3-SU10	-112.15553	41.08724	6/3/2017			X	X							X												X		
DU3-SU10	-112.15553	41.08275	6/4/2017		X		X							X												X		
DU3-SU10	-112.15553	41.07826	6/5/2017		X					X									X									
DU3-SU10	-112.14960	41.08724	6/6/2017			X	X							X												X		
DU3-SU10	-112.14960	41.08275	6/7/2017		X		X							X												X		
DU3-SU10	-112.14960	41.07826	6/8/2017		X		X																			X		
DU3-SU10	-112.14367	41.08724	6/9/2017			X			X								X	X										
DU3-SU10	-112.14367	41.08275	6/10/2017		X		X																			X		
DU3-SU10	-112.13774	41.08724	6/11/2017			X			X									X								X		
DU3-SU10	-112.13181	41.08724	6/12/2017		X		X							X												X		
DU3-SU10	-112.12588	41.08724	6/13/2017		X		X							X												X		

Sample ID	Longitude	Latitude	Date	V	SV	NV	TC	MC	SC	NC	ETC	EMC	ESC	VF	COL	COM	COS	SA	B	SND	BM	EBM	BH	HAL	GYP	HEX	CIR	MR
DU4-SU1	-112.40689	40.69282	4/16/2017			X			X									X										
DU4-SU1	-112.40689	40.68833	4/16/2017			X			X									X										
DU4-SU1	-112.40689	40.68384	4/16/2017			X			X								X	X										
DU4-SU1	-112.40689	40.67935	4/16/2017	X					X									X										
DU4-SU1	-112.40096	40.69282	4/16/2017			X			X								X											
DU4-SU1	-112.40096	40.68833	4/16/2017			X			X								X	X										
DU4-SU1	-112.40096	40.68384	4/16/2017			X			X								X	X										
DU4-SU1	-112.40096	40.67935	4/16/2017			X			X									X										
DU4-SU1	-112.39503	40.69282	4/16/2017			X			X							X	X											
DU4-SU1	-112.39503	40.68833	4/16/2017			X			X								X	X										
DU4-SU1	-112.39503	40.68384	4/16/2017			X			X								X	X										
DU4-SU1	-112.39503	40.67935	4/16/2017		X					X																		
DU4-SU1	-112.38910	40.69282	4/16/2017			X			X							X	X											
DU4-SU1	-112.38910	40.68833	4/16/2017			X			X								X	X										
DU4-SU1	-112.38910	40.68384	4/16/2017			X			X							X	X	X										
DU4-SU1	-112.38910	40.67935	4/16/2017		X				X																			
DU4-SU1	-112.38910	40.67486	4/16/2017			X			X									X	X									
DU4-SU1	-112.38317	40.69282	4/16/2017			X			X								X	X										
DU4-SU1	-112.38317	40.68833	4/16/2017			X			X								X	X	X									
DU4-SU1	-112.38317	40.68384	4/16/2017			X			X							X		X										
DU4-SU1	-112.38317	40.67935	4/16/2017			X			X							X												
DU4-SU1	-112.38317	40.67486	4/16/2017			X			X																			
DU4-SU1	-112.37724	40.67935	4/16/2017			X			X										X									
DU4-SU1	-112.37724	40.67486	4/16/2017			X			X							X												
DU4-SU1	-112.37724	40.67037	4/16/2017			X			X								X	X										
DU4-SU1	-112.37131	40.67486	4/16/2017			X			X							X												
DU4-SU1	-112.37131	40.67037	4/16/2017			X			X								X											
DU4-SU1	-112.36538	40.67486	4/16/2017			X			X								X	X										
DU4-SU1	-112.36538	40.67037	4/16/2017			X			X								X											

Sample ID	Longitude	Latitude	Date	V	SV	NV	TC	MC	SC	NC	ETC	EMC	ESC	VF	COL	COM	COS	SA	B	SND	BM	EBM	BH	HAL	GYP	HEX	CIR	MR
DU4-SU2	-112.40689	40.72875	4/30/2017			X			X							X												
DU4-SU2	-112.40689	40.72426	4/30/2017			X				X				X		X	X											
DU4-SU2	-112.40689	40.71977	4/30/2017			X				X				X		X	X											
DU4-SU2	-112.40689	40.71528	4/30/2017			X			X							X			X									
DU4-SU2	-112.40689	40.70630	4/30/2017			X			X										X									
DU4-SU2	-112.40689	40.70180	4/30/2017			X			X								X											
DU4-SU2	-112.40689	40.69731	4/30/2017			X			X								X											
DU4-SU2	-112.40096	40.72875	4/30/2017			X			X							X			X									
DU4-SU2	-112.40096	40.72426	4/30/2017			X			X					X		X	X											
DU4-SU2	-112.40096	40.71977	4/30/2017			X			X							X	X											
DU4-SU2	-112.40096	40.71528	4/30/2017			X			X							X	X		X									
DU4-SU2	-112.40096	40.71079	4/30/2017			X			X								X	X	X									
DU4-SU2	-112.40096	40.70630	4/30/2017			X			X							X	X	X	X									
DU4-SU2	-112.40096	40.70180	4/30/2017			X			X							X	X	X										
DU4-SU2	-112.40096	40.69731	4/30/2017			X			X							X	X											
DU4-SU2	-112.39503	40.72875	4/30/2017			X			X							X			X									
DU4-SU2	-112.39503	40.72426	4/30/2017			X			X							X	X											
DU4-SU2	-112.39503	40.71977	4/30/2017			X			X								X		X									
DU4-SU2	-112.39503	40.71528	4/30/2017			X			X							X	X		X									
DU4-SU2	-112.39503	40.70630	4/30/2017			X			X								X	X	X									
DU4-SU2	-112.39503	40.70180	4/30/2017			X			X							X	X	X										
DU4-SU2	-112.39503	40.69731	4/30/2017			X			X								X											
DU4-SU2	-112.38910	40.72875	4/30/2017			X			X					X			X											
DU4-SU2	-112.38910	40.72426	4/30/2017			X			X							X	X											
DU4-SU2	-112.38910	40.71977	4/30/2017			X			X								X											
DU4-SU2	-112.38910	40.71528	4/30/2017			X			X								X		X									
DU4-SU2	-112.38910	40.71079	4/30/2017			X			X								X	X	X									
DU4-SU2	-112.38910	40.70630	4/30/2017			X			X							X			X									
DU4-SU2	-112.38910	40.70180	4/30/2017			X			X							X			X									
DU4-SU2	-112.38910	40.69731	4/30/2017			X			X								X											
DU4-SU2	-112.38317	40.72875	4/30/2017			X			X								X											
DU4-SU2	-112.38317	40.72426	4/30/2017			X			X							X	X											
DU4-SU2	-112.38317	40.71977	4/30/2017			X			X								X		X									
DU4-SU2	-112.38317	40.71528	4/30/2017			X				X									X									
DU4-SU2	-112.38317	40.71079	4/30/2017			X			X										X									
DU4-SU2	-112.38317	40.70630	4/30/2017			X			X										X									
DU4-SU2	-112.38317	40.69731	4/30/2017			X			X								X											

Sample ID	Longitude	Latitude	Date	V	SV	NV	TC	MC	SC	NC	ETC	EMC	ESC	VF	COL	COM	COS	SA	B	SND	BM	EBM	BH	HAL	GYP	HEX	CIR	MR
DU4-SU3	-112.40689	40.76468	4/23/2017			X			X							X	X											
DU4-SU3	-112.40689	40.75570	4/23/2017			X			X								X											
DU4-SU3	-112.40689	40.75121	4/23/2017			X			X									X										
DU4-SU3	-112.40689	40.74672	4/23/2017			X			X									X										
DU4-SU3	-112.40689	40.74223	4/23/2017			X			X									X										
DU4-SU3	-112.40689	40.73773	4/23/2017			X			X																			
DU4-SU3	-112.40689	40.73324	4/23/2017			X			X																			
DU4-SU3	-112.40096	40.76468	4/23/2017			X			X							X	X											
DU4-SU3	-112.40096	40.76019	4/23/2017			X				X				X			X											
DU4-SU3	-112.40096	40.75570	4/23/2017			X			X								X											
DU4-SU3	-112.40096	40.75121	4/23/2017			X			X																			
DU4-SU3	-112.40096	40.74672	4/23/2017			X			X								X											
DU4-SU3	-112.40096	40.74223	4/23/2017			X			X																			
DU4-SU3	-112.40096	40.73773	4/23/2017			X			X								X											
DU4-SU3	-112.40096	40.73324	4/23/2017			X			X							X												
DU4-SU3	-112.39503	40.75570	4/23/2017			X			X							X												
DU4-SU3	-112.39503	40.75121	4/23/2017			X			X					X			X											
DU4-SU3	-112.39503	40.74672	4/23/2017			X			X																			
DU4-SU3	-112.39503	40.74223	4/23/2017			X			X																			
DU4-SU3	-112.39503	40.73773	4/23/2017			X			X								X											
DU4-SU3	-112.39503	40.73324	4/23/2017			X				X																		
DU4-SU3	-112.38910	40.75570	4/23/2017			X			X									X	X									
DU4-SU3	-112.38910	40.75121	4/23/2017			X			X																			
DU4-SU3	-112.38910	40.74672	4/23/2017			X			X																			
DU4-SU3	-112.38910	40.74223	4/23/2017			X			X								X											
DU4-SU3	-112.38910	40.73773	4/23/2017			X				X						X												
DU4-SU3	-112.38317	40.74223	4/23/2017			X			X								X											
DU4-SU3	-112.38317	40.73773	4/23/2017			X			X									X										
DU4-SU3	-112.38317	40.73324	4/23/2017			X			X																			
DU4-SU3	-112.37724	40.74223	4/23/2017			X			X										X									
DU4-SU3	-112.37724	40.73773	4/23/2017			X			X									X										
DU4-SU3	-112.37131	40.73998	4/23/2017			X				X				X		X												
DU4-SU3	-112.36538	40.73998	4/23/2017			X				X				X														
DU4-SU3	-112.35945	40.73998	4/23/2017			X				X				X														
DU4-SU3	-112.35352	40.73998	4/23/2017			X				X				X	X													
DU4-SU3	-112.34759	40.73998	4/23/2017			X				X				X	X													
DU4-SU3	-112.34166	40.73998	4/23/2017			X				X				X	X													
DU4-SU3	-112.33573	40.73998	4/23/2017			X				X				X	X													
DU4-SU3	-112.32980	40.73998	4/23/2017			X				X				X	X													

Sample ID	Longitude	Latitude	Date	V	SV	NV	TC	MC	SC	NC	ETC	EMC	ESC	VF	COL	COM	COS	SA	B	SND	BM	EBM	BH	HAL	GYP	HEX	CIR	MR
DU4-SU4	-112.45435	40.71079	4/24/2018			X							X	X				X										
DU4-SU4	-112.45435	40.70630	4/24/2018			X			X									X										
DU4-SU4	-112.44842	40.71079	4/24/2018		X				X									X										
DU4-SU4	-112.44842	40.70630	4/24/2018	X					X					X														
DU4-SU4	-112.44249	40.71079	4/24/2018			X			X																			
DU4-SU4	-112.44249	40.70630	4/24/2018			X			X									X										
DU4-SU4	-112.44249	40.70181	4/24/2018			X			X									X										
DU4-SU4	-112.43656	40.71079	4/24/2018			X			X									X										
DU4-SU4	-112.43656	40.70630	4/24/2018			X			X									X										
DU4-SU4	-112.43656	40.70181	4/24/2018			X			X									X										
DU4-SU4	-112.43656	40.69732	4/24/2018			X			X									X										
DU4-SU4	-112.43656	40.69283	4/24/2018			X			X									X										
DU4-SU4	-112.43656	40.68834	4/24/2018			X			X									X										
DU4-SU4	-112.43063	40.71079	4/24/2018			X			X																			
DU4-SU4	-112.43063	40.70630	4/24/2018	X						X																		
DU4-SU4	-112.43063	40.70181	4/24/2018			X			X					X				X										
DU4-SU4	-112.43063	40.69732	4/24/2018			X			X									X										
DU4-SU4	-112.43063	40.69283	4/24/2018			X			X									X										
DU4-SU4	-112.43063	40.68834	4/24/2018			X			X									X										
DU4-SU4	-112.42470	40.70630	4/24/2018			X			X									X	X									
DU4-SU4	-112.42470	40.70181	4/24/2018			X			X									X										
DU4-SU4	-112.42470	40.69732	4/24/2018			X			X								X	X										
DU4-SU4	-112.42470	40.69283	4/24/2018			X			X									X										
DU4-SU4	-112.42470	40.68834	4/24/2018			X			X									X										
DU4-SU4	-112.42470	40.68384	4/24/2018		X				X									X										
DU4-SU4	-112.41877	40.70630	4/24/2018			X			X								X		X									
DU4-SU4	-112.41877	40.70181	4/24/2018			X				X								X										
DU4-SU4	-112.41877	40.69732	4/24/2018			X			X									X										
DU4-SU4	-112.41877	40.69283	4/24/2018			X			X									X										
DU4-SU4	-112.41877	40.68834	4/24/2018			X			X									X										
DU4-SU4	-112.41877	40.68384	4/24/2018			X						X		X														
DU4-SU4	-112.41284	40.70630	4/24/2018			X			X								X		X									
DU4-SU4	-112.41284	40.70181	4/24/2018			X			X										X									
DU4-SU4	-112.41284	40.69732	4/24/2018			X			X																			
DU4-SU4	-112.41284	40.69283	4/24/2018			X			X									X										
DU4-SU4	-112.41284	40.68834	4/24/2018			X			X									X										
DU4-SU4	-112.41284	40.68384	4/24/2018			X			X									X										

Sample ID	Longitude	Latitude	Date	V	SV	NV	TC	MC	SC	NC	ETC	EMC	ESC	VF	COL	COM	COS	SA	B	SND	BM	EBM	BH	HAL	GYP	HEX	CIR	MR
DU4-SU5	-112.50180	40.70630	5/26/2017		X			X											X							X		
DU4-SU5	-112.49587	40.70630	5/26/2017		X			X										X								X		
DU4-SU5	-112.48994	40.70630	5/26/2017		X		X																			X		
DU4-SU5	-112.48401	40.70630	5/26/2017		X				X									X								X		
DU4-SU5	-112.48401	40.70181	5/26/2017		X				X									X								X		
DU4-SU5	-112.47808	40.72875	5/26/2017			X			X									X										
DU4-SU5	-112.47808	40.71528	5/26/2017			X			X									X								X		
DU4-SU5	-112.47808	40.71079	5/26/2017		X				X									X								X		
DU4-SU5	-112.47808	40.70630	5/26/2017		X				X									X								X		
DU4-SU5	-112.47808	40.70181	5/26/2017			X			X									X								X		
DU4-SU5	-112.47215	40.72875	5/26/2017			X			X									X								X		
DU4-SU5	-112.47215	40.72426	5/26/2017			X			X									X								X		
DU4-SU5	-112.47215	40.71977	5/26/2017		X				X									X								X		
DU4-SU5	-112.47215	40.71528	5/26/2017		X				X									X								X		
DU4-SU5	-112.47215	40.71079	5/26/2017		X			X										X								X		
DU4-SU5	-112.47215	40.70630	5/26/2017			X		X										X								X		
DU4-SU5	-112.47215	40.70180	5/26/2017			X			X									X								X		
DU4-SU5	-112.47215	40.69731	5/26/2017			X			X									X								X		
DU4-SU5	-112.46622	40.72875	5/26/2017			X			X									X										
DU4-SU5	-112.46622	40.72426	5/26/2017			X			X									X								X		
DU4-SU5	-112.46622	40.71977	5/26/2017			X			X									X										
DU4-SU5	-112.46622	40.71528	5/26/2017			X			X									X										
DU4-SU5	-112.46622	40.71079	5/26/2017		X			X						X				X								X		
DU4-SU5	-112.46622	40.70630	5/26/2017			X			X									X										
DU4-SU5	-112.46622	40.70180	5/26/2017			X			X									X										
DU4-SU5	-112.46622	40.69731	5/26/2017			X			X									X										
DU4-SU5	-112.46029	40.72875	5/26/2017			X			X									X										
DU4-SU5	-112.46029	40.72426	5/26/2017			X			X									X										
DU4-SU5	-112.46029	40.71977	5/26/2017			X			X									X								X		
DU4-SU5	-112.46029	40.71528	5/26/2017			X			X									X										
DU4-SU5	-112.46029	40.71079	5/26/2017			X		X										X								X		
DU4-SU5	-112.46029	40.70630	5/26/2017		X			X						X												X		
DU4-SU5	-112.46029	40.70180	5/26/2017		X				X					X														
DU4-SU5	-112.46029	40.69731	5/26/2017			X			X									X										

Sample ID	Longitude	Latitude	Date	V	SV	NV	TC	MC	SC	NC	ETC	EMC	ESC	VF	COL	COM	COS	SA	B	SND	BM	EBM	BH	HAL	GYP	HEX	CIR	MR
DU4-SU6	-112.43062	40.76468	4/25/2018		X											X	X											
DU4-SU6	-112.43062	40.76019	4/25/2018			X			X									X										
DU4-SU6	-112.43062	40.75570	4/25/2018			X			X									X										
DU4-SU6	-112.43062	40.75121	4/25/2018			X			X									X										
DU4-SU6	-112.43062	40.74672	4/25/2018			X			X									X										
DU4-SU6	-112.43062	40.74223	4/25/2018			X			X									X										
DU4-SU6	-112.43062	40.73773	4/25/2018			X			X									X										
DU4-SU6	-112.43062	40.73324	4/25/2018			X			X									X										
DU4-SU6	-112.43062	40.72875	4/25/2018			X			X									X										
DU4-SU6	-112.43062	40.72426	4/25/2018			X			X									X										
DU4-SU6	-112.43062	40.71977	4/25/2018			X			X									X										
DU4-SU6	-112.43062	40.71528	4/25/2018			X			X									X										
DU4-SU6	-112.42469	40.76468	4/25/2018			X			X								X	X										
DU4-SU6	-112.42469	40.76019	4/25/2018			X			X									X										
DU4-SU6	-112.42469	40.75570	4/25/2018			X			X									X										
DU4-SU6	-112.42469	40.75121	4/25/2018			X			X									X										
DU4-SU6	-112.42469	40.74672	4/25/2018			X			X									X										
DU4-SU6	-112.42469	40.74223	4/25/2018			X			X									X										
DU4-SU6	-112.42469	40.73773	4/25/2018			X			X									X										
DU4-SU6	-112.42469	40.73324	4/25/2018			X			X									X										
DU4-SU6	-112.42469	40.72875	4/25/2018			X			X									X										
DU4-SU6	-112.42469	40.72426	4/25/2018			X			X									X										
DU4-SU6	-112.42469	40.71977	4/25/2018			X			X									X										
DU4-SU6	-112.42469	40.71528	4/25/2018			X			X									X	X									
DU4-SU6	-112.41876	40.76468	4/25/2018			X			X								X	X										
DU4-SU6	-112.41876	40.76019	4/25/2018			X			X									X										
DU4-SU6	-112.41876	40.75570	4/25/2018			X			X									X										
DU4-SU6	-112.41876	40.75121	4/25/2018			X			X									X										
DU4-SU6	-112.41876	40.74672	4/25/2018			X			X									X										
DU4-SU6	-112.41876	40.74223	4/25/2018			X			X									X										
DU4-SU6	-112.41876	40.73773	4/25/2018			X			X									X										
DU4-SU6	-112.41876	40.73324	4/25/2018			X			X									X										
DU4-SU6	-112.41876	40.72875	4/25/2018			X			X									X										
DU4-SU6	-112.41876	40.72426	4/25/2018			X			X									X										
DU4-SU6	-112.41876	40.71977	4/25/2018			X			X									X										
DU4-SU6	-112.41876	40.71528	4/25/2018			X			X									X	X									
DU4-SU6	-112.41283	40.76468	4/25/2018			X			X					X				X										
DU4-SU6	-112.41283	40.76019	4/25/2018			X			X									X										
DU4-SU6	-112.41283	40.75570	4/25/2018			X			X									X										
DU4-SU6	-112.41283	40.75121	4/25/2018			X			X									X										
DU4-SU6	-112.41283	40.74672	4/25/2018			X			X									X										
DU4-SU6	-112.41283	40.74223	4/25/2018			X			X									X										
DU4-SU6	-112.41283	40.73773	4/25/2018			X			X									X										
DU4-SU6	-112.41283	40.73324	4/25/2018			X			X									X	X									
DU4-SU6	-112.41283	40.72875	4/25/2018			X			X									X	X									
DU4-SU6	-112.41283	40.72426	4/25/2018			X			X									X	X									
DU4-SU6	-112.41283	40.71977	4/25/2018			X			X									X										
DU4-SU6	-112.41283	40.71528	4/25/2018			X			X									X	X									

Sample ID	Longitude	Latitude	Date	V	SV	NV	TC	MC	SC	NC	ETC	EMC	ESC	VF	COL	COM	COS	SA	B	SND	BM	EBM	BH	HAL	GYP	HEX	CIR	MR
DU4-SU7	-112.45435	40.76468	4/26/2018			X			X									X										
DU4-SU7	-112.45435	40.76019	4/26/2018			X			X									X										
DU4-SU7	-112.45435	40.75570	4/26/2018			X			X									X										
DU4-SU7	-112.45435	40.75121	4/26/2018			X			X									X										
DU4-SU7	-112.45435	40.74672	4/26/2018			X			X									X										
DU4-SU7	-112.45435	40.74223	4/26/2018			X			X									X										
DU4-SU7	-112.45435	40.73773	4/26/2018			X			X									X										
DU4-SU7	-112.45435	40.73324	4/26/2018			X			X									X										
DU4-SU7	-112.45435	40.72875	4/26/2018			X			X									X										
DU4-SU7	-112.45435	40.72426	4/26/2018			X			X									X										
DU4-SU7	-112.45435	40.71977	4/26/2018			X			X									X										
DU4-SU7	-112.45435	40.71528	4/26/2018			X							X	X				X										
DU4-SU7	-112.44842	40.76468	4/26/2018			X			X									X										
DU4-SU7	-112.44842	40.76019	4/26/2018			X			X									X										
DU4-SU7	-112.44842	40.75570	4/26/2018			X			X									X										
DU4-SU7	-112.44842	40.75121	4/26/2018			X			X									X										
DU4-SU7	-112.44842	40.74672	4/26/2018			X			X									X										
DU4-SU7	-112.44842	40.74223	4/26/2018			X			X									X										
DU4-SU7	-112.44842	40.73773	4/26/2018			X			X									X										
DU4-SU7	-112.44842	40.73324	4/26/2018			X			X									X										
DU4-SU7	-112.44842	40.72875	4/26/2018			X			X									X										
DU4-SU7	-112.44842	40.72426	4/26/2018			X			X									X										
DU4-SU7	-112.44842	40.71977	4/26/2018			X			X									X										
DU4-SU7	-112.44842	40.71528	4/26/2018			X			X								X	X										
DU4-SU7	-112.44249	40.76468	4/26/2018			X			X									X										
DU4-SU7	-112.44249	40.76019	4/26/2018			X			X									X										
DU4-SU7	-112.44249	40.75570	4/26/2018			X			X									X										
DU4-SU7	-112.44249	40.75121	4/26/2018			X			X									X										
DU4-SU7	-112.44249	40.74672	4/26/2018			X			X									X										
DU4-SU7	-112.44249	40.74223	4/26/2018			X			X									X										
DU4-SU7	-112.44249	40.73773	4/26/2018			X			X									X										
DU4-SU7	-112.44249	40.73324	4/26/2018			X			X									X										
DU4-SU7	-112.44249	40.72875	4/26/2018			X			X									X										
DU4-SU7	-112.44249	40.72426	4/26/2018			X			X									X										
DU4-SU7	-112.44249	40.71977	4/26/2018			X			X									X										
DU4-SU7	-112.44249	40.71528	4/26/2018		X				X					X														
DU4-SU7	-112.43656	40.76468	4/26/2018			X			X									X										
DU4-SU7	-112.43656	40.76019	4/26/2018			X			X									X										
DU4-SU7	-112.43656	40.75570	4/26/2018			X			X									X										
DU4-SU7	-112.43656	40.75121	4/26/2018			X			X									X										
DU4-SU7	-112.43656	40.74672	4/26/2018			X			X									X										
DU4-SU7	-112.43656	40.74223	4/26/2018			X			X									X										
DU4-SU7	-112.43656	40.73773	4/26/2018			X			X									X										X
DU4-SU7	-112.43656	40.73324	4/26/2018			X			X									X										X
DU4-SU7	-112.43656	40.72875	4/26/2018			X			X									X										
DU4-SU7	-112.43656	40.72426	4/26/2018			X			X									X										
DU4-SU7	-112.43656	40.71977	4/26/2018			X			X								X	X										
DU4-SU7	-112.43656	40.71528	4/26/2018		X				X																			

Sample ID	Longitude	Latitude	Date	V	SV	NV	TC	MC	SC	NC	ETC	EMC	ESC	VF	COL	COM	COS	SA	B	SND	BM	EBM	BH	HAL	GYP	HEX	CIR	MR
DU4-SU8	-112.49587	40.76468	4/28/2018			X			X																			
DU4-SU8	-112.49587	40.76019	4/28/2018			X			X																			
DU4-SU8	-112.49587	40.75570	4/28/2018			X			X																			
DU4-SU8	-112.49587	40.75121	4/28/2018			X			X																			
DU4-SU8	-112.49587	40.74672	4/28/2018			X			X																			
DU4-SU8	-112.49587	40.74223	4/28/2018			X			X																			
DU4-SU8	-112.48994	40.76468	4/28/2018			X			X								X	X										
DU4-SU8	-112.48994	40.76019	4/28/2018			X			X							X		X										
DU4-SU8	-112.48994	40.75570	4/28/2018			X			X									X										
DU4-SU8	-112.48994	40.75121	4/28/2018			X			X									X										
DU4-SU8	-112.48994	40.74672	4/28/2018			X			X									X										
DU4-SU8	-112.48994	40.74223	4/28/2018			X			X									X										
DU4-SU8	-112.48994	40.73773	4/28/2018			X			X									X										
DU4-SU8	-112.48401	40.76468	4/28/2018			X			X									X										
DU4-SU8	-112.48401	40.76019	4/28/2018			X			X									X										
DU4-SU8	-112.48401	40.75570	4/28/2018			X			X								X	X										
DU4-SU8	-112.48401	40.75121	4/28/2018			X			X							X		X										
DU4-SU8	-112.48401	40.74672	4/28/2018			X			X									X										
DU4-SU8	-112.48401	40.74223	4/28/2018			X			X									X										
DU4-SU8	-112.48401	40.73773	4/28/2018			X			X									X										
DU4-SU8	-112.47808	40.76468	4/28/2018			X			X								X	X										
DU4-SU8	-112.47808	40.76019	4/28/2018			X			X								X	X										
DU4-SU8	-112.47808	40.75570	4/28/2018			X			X								X	X										
DU4-SU8	-112.47808	40.75121	4/28/2018			X			X							X	X	X										
DU4-SU8	-112.47808	40.74672	4/28/2018			X			X								X	X										
DU4-SU8	-112.47808	40.74223	4/28/2018			X			X									X										
DU4-SU8	-112.47808	40.73773	4/28/2018			X			X									X										
DU4-SU8	-112.47808	40.73324	4/28/2018			X			X									X										
DU4-SU8	-112.47215	40.76468	4/28/2018			X			X								X	X										
DU4-SU8	-112.47215	40.76019	4/28/2018			X			X								X	X										
DU4-SU8	-112.47215	40.75570	4/28/2018			X			X								X	X										
DU4-SU8	-112.47215	40.75121	4/28/2018			X			X									X										
DU4-SU8	-112.47215	40.74672	4/28/2018			X			X								X	X										
DU4-SU8	-112.47215	40.74223	4/28/2018			X			X									X										
DU4-SU8	-112.47215	40.73773	4/28/2018			X			X									X										
DU4-SU8	-112.47215	40.73324	4/28/2018			X			X									X										
DU4-SU8	-112.46622	40.76468	4/28/2018			X			X									X										
DU4-SU8	-112.46622	40.76019	4/28/2018			X			X									X										
DU4-SU8	-112.46622	40.75570	4/28/2018			X			X									X										
DU4-SU8	-112.46622	40.75121	4/28/2018			X			X									X										
DU4-SU8	-112.46622	40.74672	4/28/2018			X			X								X	X										
DU4-SU8	-112.46622	40.74223	4/28/2018			X			X									X										
DU4-SU8	-112.46622	40.73773	4/28/2018			X			X									X										
DU4-SU8	-112.46622	40.73324	4/28/2018			X			X									X										
DU4-SU8	-112.46029	40.76468	4/28/2018			X			X									X										
DU4-SU8	-112.46029	40.76019	4/28/2018			X			X									X										
DU4-SU8	-112.46029	40.75570	4/28/2018			X			X									X										
DU4-SU8	-112.46029	40.75121	4/28/2018			X			X									X										
DU4-SU8	-112.46029	40.74672	4/28/2018			X			X									X										
DU4-SU8	-112.46029	40.74223	4/28/2018			X			X									X										
DU4-SU8	-112.46029	40.73773	4/28/2018			X			X									X										
DU4-SU8	-112.46029	40.73324	4/28/2018			X			X									X										

Sample ID	Longitude	Latitude	Date	V	SV	NV	TC	MC	SC	NC	ETC	EMC	ESC	VF	COL	COM	COS	SA	B	SND	BM	EBM	BH	HAL	GYP	HEX	CIR	MR
DU4-SU9	-112.45435	40.79612	5/1/2017		X				X							X												
DU4-SU9	-112.45435	40.79163	5/1/2017			X			X							X	X											
DU4-SU9	-112.45435	40.78714	5/1/2017			X			X																			
DU4-SU9	-112.45435	40.78265	5/1/2017			X			X																			
DU4-SU9	-112.45435	40.77816	5/1/2017			X			X					X			X											
DU4-SU9	-112.45435	40.77367	5/1/2017			X			X								X	X										
DU4-SU9	-112.45435	40.76917	5/1/2017			X			X																			
DU4-SU9	-112.44842	40.79612	5/1/2017		X				X							X												
DU4-SU9	-112.44842	40.79163	5/1/2017		X					X																		
DU4-SU9	-112.44842	40.78714	5/1/2017		X					X						X	X											
DU4-SU9	-112.44842	40.78265	5/1/2017			X							X															
DU4-SU9	-112.44842	40.77816	5/1/2017		X				X								X											
DU4-SU9	-112.44842	40.77367	5/1/2017			X			X							X												
DU4-SU9	-112.44842	40.76917	5/1/2017			X			X																			
DU4-SU9	-112.44249	40.79163	5/1/2017		X				X						X	X												
DU4-SU9	-112.44249	40.78714	5/1/2017			X			X									X										
DU4-SU9	-112.44249	40.78265	5/1/2017			X			X									X										
DU4-SU9	-112.44249	40.77816	5/1/2017			X			X							X												
DU4-SU9	-112.44249	40.77367	5/1/2017			X			X																			
DU4-SU9	-112.44249	40.76917	5/1/2017			X							X															
DU4-SU9	-112.43656	40.79612	5/1/2017		X				X						X	X												
DU4-SU9	-112.43656	40.79163	5/1/2017		X				X						X	X												
DU4-SU9	-112.43656	40.78714	5/1/2017			X			X							X	X											
DU4-SU9	-112.43656	40.78265	5/1/2017			X			X									X										
DU4-SU9	-112.43656	40.77816	5/1/2017			X			X							X												
DU4-SU9	-112.43656	40.77367	5/1/2017			X			X									X										
DU4-SU9	-112.43656	40.76917	5/1/2017			X			X									X										
DU4-SU9	-112.43063	40.78265	5/1/2017		X				X								X											
DU4-SU9	-112.43063	40.77816	5/1/2017			X			X									X										
DU4-SU9	-112.43063	40.77367	5/1/2017			X			X								X	X										
DU4-SU9	-112.43063	40.76917	5/1/2017			X			X								X	X										
DU4-SU9	-112.42470	40.78265	5/1/2017			X			X								X											
DU4-SU9	-112.42470	40.77816	5/1/2017			X			X																			
DU4-SU9	-112.42470	40.77367	5/1/2017			X			X								X											
DU4-SU9	-112.42470	40.76917	5/1/2017			X			X									X										
DU4-SU9	-112.41877	40.77816	5/1/2017			X			X								X											
DU4-SU9	-112.41877	40.77367	5/1/2017			X			X								X											
DU4-SU9	-112.41877	40.76917	5/1/2017		X					X				X			X											
DU4-SU9	-112.41284	40.77367	5/1/2017			X				X																		
DU4-SU9	-112.41284	40.76917	5/1/2017			X			X								X											
DU4-SU9	-112.40691	40.77367	5/1/2017			X			X								X											
DU4-SU9	-112.40691	40.76917	5/1/2017			X			X								X	X										
DU4-SU9	-112.40098	40.76917	5/1/2017			X				X																		

Sample ID	Longitude	Latitude	Date	V	SV	NV	TC	MC	SC	NC	ETC	EMC	ESC	VF	COL	COM	COS	SA	B	SND	BM	EBM	BH	HAL	GYP	HEX	CIR	MR
DU4-SU10	-112.49587	40.76917	6/14/2017			X			X									X										
DU4-SU10	-112.48994	40.77816	6/14/2017			X			X									X										
DU4-SU10	-112.48994	40.77367	6/14/2017			X			X									X	X									
DU4-SU10	-112.48994	40.76918	6/14/2017			X			X									X										
DU4-SU10	-112.48401	40.77816	6/14/2017			X			X									X										
DU4-SU10	-112.48401	40.77367	6/14/2017			X			X									X										
DU4-SU10	-112.48401	40.76918	6/14/2017			X			X									X										
DU4-SU10	-112.47808	40.78265	6/14/2017			X			X									X										
DU4-SU10	-112.47808	40.77816	6/14/2017			X			X									X										
DU4-SU10	-112.47808	40.77367	6/14/2017			X			X									X										
DU4-SU10	-112.47808	40.76918	6/14/2017			X			X									X										
DU4-SU10	-112.47215	40.78714	6/14/2017			X			X									X										
DU4-SU10	-112.47215	40.78265	6/14/2017			X			X									X										
DU4-SU10	-112.47215	40.77816	6/14/2017			X			X									X										
DU4-SU10	-112.47215	40.77367	6/14/2017			X			X									X										
DU4-SU10	-112.47215	40.76918	6/14/2017			X			X									X										
DU4-SU10	-112.46622	40.80061	6/14/2017		X			X																		X		
DU4-SU10	-112.46622	40.79163	6/14/2017			X			X									X										
DU4-SU10	-112.46622	40.78714	6/14/2017			X			X									X										
DU4-SU10	-112.46622	40.78265	6/14/2017			X			X									X										
DU4-SU10	-112.46622	40.77816	6/14/2017			X			X									X										
DU4-SU10	-112.46622	40.77367	6/14/2017			X			X							X		X										
DU4-SU10	-112.46622	40.76918	6/14/2017			X			X									X										
DU4-SU10	-112.46029	40.80062	6/14/2017		X				X								X	X										
DU4-SU10	-112.46029	40.79612	6/14/2017		X				X					X		X		X										
DU4-SU10	-112.46029	40.79163	6/14/2017			X			X							X		X										
DU4-SU10	-112.46029	40.78714	6/14/2017			X			X									X										
DU4-SU10	-112.46029	40.78265	6/14/2017			X			X									X										
DU4-SU10	-112.46029	40.77816	6/14/2017			X			X							X												
DU4-SU10	-112.46029	40.77367	6/14/2017			X			X																			
DU4-SU10	-112.46029	40.76918	6/14/2017			X			X							X												

Sample ID	Longitude	Latitude	Date	V	SV	NV	TC	MC	SC	NC	ETC	EMC	ESC	VF	COL	COM	COS	SA	B	SND	BM	EBM	BH	HAL	GYP	HEX	CIR	MR
DU4-SU11	-112.47214	40.80960	6/14/2017			X			X								X											
DU4-SU11	-112.47214	40.80511	6/14/2017			X			X																			
DU4-SU11	-112.46621	40.83654	6/14/2017			X				X						X	X											
DU4-SU11	-112.46621	40.83205	6/14/2017			X			X																			
DU4-SU11	-112.46621	40.82756	6/14/2017			X			X								X											
DU4-SU11	-112.46621	40.81409	6/14/2017			X			X								X											
DU4-SU11	-112.46621	40.80960	6/14/2017			X			X								X	X										
DU4-SU11	-112.46621	40.80511	6/14/2017			X			X								X	X										
DU4-SU11	-112.46028	40.83654	6/14/2017			X				X						X	X											
DU4-SU11	-112.46028	40.83205	6/14/2017			X				X						X	X											
DU4-SU11	-112.46028	40.82756	6/14/2017			X				X						X	X											
DU4-SU11	-112.46028	40.82307	6/14/2017			X				X						X	X											
DU4-SU11	-112.46028	40.81858	6/14/2017		X					X				X			X											
DU4-SU11	-112.46028	40.81409	6/14/2017		X					X				X			X											
DU4-SU11	-112.46028	40.80959	6/14/2017			X			X								X											
DU4-SU11	-112.46028	40.80510	6/14/2017		X					X						X	X											
DU4-SU11	-112.45435	40.82756	6/14/2017			X				X							X											
DU4-SU11	-112.45435	40.82307	6/14/2017			X				X							X											
DU4-SU11	-112.45435	40.81858	6/14/2017		X					X							X											
DU4-SU11	-112.45435	40.81409	6/14/2017		X					X				X			X											
DU4-SU11	-112.45435	40.80959	6/14/2017			X			X								X											
DU4-SU11	-112.45435	40.80510	6/14/2017		X					X						X	X											
DU4-SU11	-112.44842	40.82307	6/14/2017		X						X			X	X													
DU4-SU11	-112.44842	40.81858	6/14/2017		X						X				X													
DU4-SU11	-112.44842	40.81409	6/14/2017		X						X				X	X												
DU4-SU11	-112.44249	40.81858	6/14/2017		X						X				X	X												
DU4-SU11	-112.44249	40.81409	6/14/2017		X					X				X		X	X											
DU4-SU11	-112.43656	40.81858	6/14/2017		X						X				X	X												
DU4-SU11	-112.43656	40.81409	6/14/2017		X							X			X	X												

Sample ID	Longitude	Latitude	Date	V	SV	NV	TC	MC	SC	NC	ETC	EMC	ESC	VF	COL	COM	COS	SA	B	SND	BM	EBM	BH	HAL	GYP	HEX	CIR	MR
DU4-SU12	-112.49978	40.91739	5/14/2017			X		X								X	X	X										
DU4-SU12	-112.49978	40.91290	5/14/2017			X		X									X	X										
DU4-SU12	-112.49978	40.90841	5/14/2017	X						X							X											
DU4-SU12	-112.49385	40.90841	5/14/2017			X		X									X	X										
DU4-SU12	-112.49385	40.90392	5/14/2017		X					X							X											
DU4-SU12	-112.49385	40.89943	5/14/2017		X			X								X	X											
DU4-SU12	-112.49385	40.89494	5/14/2017			X			X							X	X											
DU4-SU12	-112.49385	40.89044	5/14/2017			X		X								X	X											
DU4-SU12	-112.48792	40.89943	5/14/2017			X		X									X											
DU4-SU12	-112.48792	40.89494	5/14/2017			X		X									X											
DU4-SU12	-112.48792	40.89044	5/14/2017		X				X								X											
DU4-SU12	-112.48792	40.88595	5/14/2017			X			X								X											
DU4-SU12	-112.48199	40.88595	5/14/2017			X		X								X	X											
DU4-SU12	-112.48199	40.88146	5/14/2017			X		X									X											
DU4-SU12	-112.47606	40.87697	5/14/2017		X			X							X	X			X									
DU4-SU12	-112.47606	40.87248	5/14/2017			X				X							X											
DU4-SU12	-112.47606	40.86799	5/14/2017			X			X								X		X									
DU4-SU12	-112.47606	40.86350	5/14/2017			X			X								X		X									
DU4-SU12	-112.47606	40.85901	5/14/2017			X			X							X												
DU4-SU12	-112.47013	40.86350	5/14/2017			X		X								X	X											
DU4-SU12	-112.47013	40.85901	5/14/2017			X		X								X	X											
DU4-SU12	-112.47013	40.85452	5/14/2017			X			X							X	X											
DU4-SU12	-112.47013	40.85003	5/14/2017			X			X						X	X												
DU4-SU12	-112.47013	40.84553	5/14/2017		X					X						X												
DU4-SU12	-112.46420	40.85003	5/14/2017			X				X							X											
DU4-SU12	-112.46420	40.84553	5/14/2017			X			X								X											
DU4-SU12	-112.46420	40.84104	5/14/2017			X			X								X											
DU4-SU12	-112.45827	40.84104	5/14/2017		X					X						X	X											

Sample ID	Longitude	Latitude	Date	V	SV	NV	TC	MC	SC	NC	ETC	EMC	ESC	VF	COL	COM	COS	SA	B	SND	BM	EBM	BH	HAL	GYP	HEX	CIR	MR
DU4-SU13	-112.53833	40.89942	5/15/2017			X			X									X										
DU4-SU13	-112.53833	40.89493	5/15/2017		X				X																			
DU4-SU13	-112.53536	40.89942	5/15/2017			X		X									X											
DU4-SU13	-112.53536	40.89717	5/15/2017		X					X				X						X								
DU4-SU13	-112.53240	40.90167	5/15/2017			X			X									X										
DU4-SU13	-112.53240	40.89942	5/15/2017		X					X				X			X											
DU4-SU13	-112.52943	40.91963	5/15/2017			X			X																			
DU4-SU13	-112.52943	40.91739	5/15/2017	X					X					X														
DU4-SU13	-112.52943	40.90391	5/15/2017			X			X									X										
DU4-SU13	-112.52943	40.90167	5/15/2017		X					X				X														
DU4-SU13	-112.52647	40.91963	5/15/2017		X				X								X											
DU4-SU13	-112.52647	40.91739	5/15/2017	X				X						X														
DU4-SU13	-112.52647	40.91065	5/15/2017		X				X																			
DU4-SU13	-112.52647	40.90840	5/15/2017		X				X								X											
DU4-SU13	-112.52647	40.90616	5/15/2017		X				X																			
DU4-SU13	-112.52350	40.92413	5/15/2017		X					X						X												
DU4-SU13	-112.52350	40.92188	5/15/2017		X					X				X			X											
DU4-SU13	-112.52350	40.91964	5/15/2017			X				X				X			X											
DU4-SU13	-112.52350	40.91739	5/15/2017		X					X				X														
DU4-SU13	-112.52350	40.91515	5/15/2017		X				X																			
DU4-SU13	-112.52054	40.92638	5/15/2017			X				X						X	X											
DU4-SU13	-112.52054	40.92413	5/15/2017		X					X				X		X												
DU4-SU13	-112.52054	40.92188	5/15/2017			X		X									X											
DU4-SU13	-112.52054	40.91964	5/15/2017			X		X									X											
DU4-SU13	-112.52054	40.91739	5/15/2017		X			X						X			X											
DU4-SU13	-112.52054	40.91515	5/15/2017	X						X				X														
DU4-SU13	-112.51757	40.92638	5/15/2017		X					X							X											
DU4-SU13	-112.51757	40.92413	5/15/2017		X					X										X								
DU4-SU13	-112.51757	40.92188	5/15/2017			X			X								X											
DU4-SU13	-112.51757	40.91964	5/15/2017			X		X																				
DU4-SU13	-112.51757	40.91739	5/15/2017		X				X					X														
DU4-SU13	-112.51757	40.91515	5/15/2017	X						X										X								

Sample ID	Longitude	Latitude	Date	V	SV	NV	TC	MC	SC	NC	ETC	EMC	ESC	VF	COL	COM	COS	SA	B	SND	BM	EBM	BH	HAL	GYP	HEX	CIR	MR
DU5-SU1	-112.38390	41.30385	6/4/2018			X					X							X								X		
DU5-SU1	-112.38390	41.29936	6/4/2018			X					X							X								X		
DU5-SU1	-112.38390	41.29487	6/4/2018			X			X									X										
DU5-SU1	-112.38093	41.29262	6/4/2018			X					X							X										
DU5-SU1	-112.38093	41.28813	6/4/2018			X			X									X										
DU5-SU1	-112.38093	41.28364	6/4/2018			X			X									X										
DU5-SU1	-112.37797	41.28364	6/4/2018																									X
DU5-SU1	-112.37500	41.28364	6/4/2018			X			X									X										
DU5-SU1	-112.37500	41.27915	6/4/2018			X			X									X										
DU5-SU1	-112.37500	41.27466	6/4/2018			X			X									X										
DU5-SU1	-112.36907	41.27466	6/4/2018			X					X							X								X		

Sample ID	Longitude	Latitude	Date	V	SV	NV	TC	MC	SC	NC	ETC	EMC	ESC	VF	COL	COM	COS	SA	B	SND	BM	EBM	BH	HAL	GYP	HEX	CIR	MR
DU5-SU2	-112.40466	41.33978	6/4/2018			X			X									X										
DU5-SU2	-112.40169	41.33978	6/4/2018			X			X										X		X							
DU5-SU2	-112.39873	41.33978	6/4/2018			X			X										X									
DU5-SU2	-112.39576	41.33978	6/4/2018			X					X			X				X										
DU5-SU2	-112.39576	41.33529	6/4/2018			X					X			X														
DU5-SU2	-112.39576	41.33080	6/4/2018			X					X		X	X														
DU5-SU2	-112.39576	41.32631	6/4/2018			X					X			X				X								X		
DU5-SU2	-112.39576	41.32182	6/4/2018			X			X									X										
DU5-SU2	-112.39576	41.31733	6/4/2018			X			X									X										
DU5-SU2	-112.39576	41.31283	6/4/2018			X							X	X														
DU5-SU2	-112.39280	41.33978	6/4/2018			X			X									X										
DU5-SU2	-112.38983	41.33978	6/4/2018			X	X																			X		
DU5-SU2	-112.38983	41.33529	6/4/2018			X	X																			X		
DU5-SU2	-112.38983	41.33080	6/4/2018			X					X															X		
DU5-SU2	-112.38983	41.32631	6/4/2018			X					X		X	X												X		
DU5-SU2	-112.38983	41.32182	6/4/2018			X					X			X												X		
DU5-SU2	-112.38983	41.31733	6/4/2018			X			X									X										
DU5-SU2	-112.38983	41.31283	6/4/2018			X			X									X										
DU5-SU2	-112.38983	41.30834	6/4/2018			X					X							X								X		

Sample ID	Longitude	Latitude	Date	V	SV	NV	TC	MC	SC	NC	ETC	EMC	ESC	VF	COL	COM	COS	SA	B	SND	BM	EBM	BH	HAL	GYP	HEX	CIR	MR
DU5-SU3	-112.41949	41.36449	5/30/2018		X				X							X	X											
DU5-SU3	-112.41949	41.36000	5/30/2018			X							X	X			X											
DU5-SU3	-112.41949	41.35551	5/30/2018			X			X								X											
DU5-SU3	-112.41949	41.35102	5/30/2018			X			X								X											
DU5-SU3	-112.41356	41.36898	5/30/2018		X				X					X		X	X											
DU5-SU3	-112.41356	41.36449	5/30/2018		X								X	X														
DU5-SU3	-112.41356	41.36000	5/30/2018			X							X	X														
DU5-SU3	-112.41356	41.35551	5/30/2018			X							X	X														
DU5-SU3	-112.41356	41.35102	5/30/2018			X							X	X														
DU5-SU3	-112.41356	41.34653	5/30/2018			X							X	X														
DU5-SU3	-112.40763	41.36898	5/30/2018			X			X									X										
DU5-SU3	-112.40763	41.36449	5/30/2018			X							X	X														
DU5-SU3	-112.40763	41.36000	5/30/2018			X						X		X														
DU5-SU3	-112.40763	41.35551	5/30/2018			X							X	X														
DU5-SU3	-112.40763	41.35102	5/30/2018			X							X	X														
DU5-SU3	-112.40763	41.34653	5/30/2018			X							X	X														
DU5-SU3	-112.40763	41.34204	5/30/2018			X			X									X										
DU5-SU3	-112.40170	41.37347	5/30/2018			X					X		X	X												X		
DU5-SU3	-112.40170	41.36898	5/30/2018			X					X			X												X		
DU5-SU3	-112.40170	41.36449	5/30/2018			X						X		X												X		
DU5-SU3	-112.40170	41.36000	5/30/2018			X							X	X														
DU5-SU3	-112.40170	41.35551	5/30/2018			X						X		X														
DU5-SU3	-112.40170	41.35102	5/30/2018			X							X	X														
DU5-SU3	-112.40170	41.34653	5/30/2018			X							X	X														
DU5-SU3	-112.40170	41.34204	5/30/2018			X			X									X										
DU5-SU3	-112.39577	41.37347	5/30/2018			X					X			X												X		
DU5-SU3	-112.39577	41.36898	5/30/2018			X					X			X												X		
DU5-SU3	-112.39577	41.36449	5/30/2018			X					X			X												X		
DU5-SU3	-112.39577	41.36000	5/30/2018			X							X	X														
DU5-SU3	-112.39577	41.35551	5/30/2018			X							X	X														
DU5-SU3	-112.39577	41.35102	5/30/2018			X			X					X				X										
DU5-SU3	-112.39577	41.34653	5/30/2018			X						X		X				X										
DU5-SU3	-112.39577	41.34204	5/30/2018			X						X		X				X										
DU5-SU3	-112.38984	41.37347	5/30/2018			X					X															X		
DU5-SU3	-112.38984	41.36898	5/30/2018			X					X			X												X		
DU5-SU3	-112.38984	41.36449	5/30/2018			X					X			X												X		
DU5-SU3	-112.38984	41.36000	5/30/2018			X					X			X				X								X		

Sample ID	Longitude	Latitude	Date	V	SV	NV	TC	MC	SC	NC	ETC	EMC	ESC	VF	COL	COM	COS	SA	B	SND	BM	EBM	BH	HAL	GYP	HEX	CIR	MR
DU5-SU4	-112.33645	41.38245	6/25/2018		X				X									X										
DU5-SU4	-112.33645	41.37347	6/25/2018			X			X									X										
DU5-SU4	-112.32458	41.39144	6/25/2018			X			X									X										
DU5-SU4	-112.32458	41.38245	6/25/2018		X				X					X				X										
DU5-SU4	-112.32458	41.37347	6/25/2018			X							X	X				X										
DU5-SU4	-112.32458	41.36449	6/25/2018			X			X									X										
DU5-SU4	-112.31272	41.41838	6/25/2018		X								X	X														
DU5-SU4	-112.31272	41.40940	6/25/2018		X						X			X				X										
DU5-SU4	-112.31272	41.40042	6/25/2018		X						X			X				X										
DU5-SU4	-112.31272	41.39144	6/25/2018		X							X		X														
DU5-SU4	-112.31272	41.38245	6/25/2018		X				X									X										
DU5-SU4	-112.31272	41.37347	6/25/2018		X				X									X										
DU5-SU4	-112.31272	41.36449	6/25/2018			X			X									X										
DU5-SU4	-112.31272	41.35500	6/25/2018		X						X		X	X														
DU5-SU4	-112.30086	41.42737	6/25/2018		X								X	X														
DU5-SU4	-112.30086	41.41838	6/25/2018		X				X									X										
DU5-SU4	-112.30086	41.40940	6/25/2018			X					X			X				X										
DU5-SU4	-112.30086	41.40042	6/25/2018			X			X									X										
DU5-SU4	-112.30086	41.39144	6/25/2018			X			X					X				X										
DU5-SU4	-112.30086	41.38245	6/25/2018			X			X									X										
DU5-SU4	-112.30086	41.37347	6/25/2018			X			X									X										
DU5-SU4	-112.30086	41.36449	6/25/2018			X							X	X														
DU5-SU4	-112.28899	41.42737	6/25/2018			X			X									X										
DU5-SU4	-112.28899	41.41838	6/25/2018			X			X									X										
DU5-SU4	-112.28899	41.40940	6/25/2018			X							X	X				X										
DU5-SU4	-112.28899	41.40042	6/25/2018		X			X						X				X										
DU5-SU4	-112.28899	41.39144	6/25/2018			X			X					X				X										
DU5-SU4	-112.28899	41.38245	6/25/2018			X			X					X				X										
DU5-SU4	-112.27713	41.41838	6/25/2018		X				X									X										
DU5-SU4	-112.27713	41.40940	6/25/2018		X						X			X												X		
DU5-SU4	-112.27713	41.40042	6/25/2018			X			X					X				X										
DU5-SU4	-112.27713	41.39144	6/25/2018			X							X	X				X										
DU5-SU4	-112.26527	41.41838	6/25/2018			X					X			X												X		
DU5-SU4	-112.26527	41.40940	6/25/2018		X						X			X												X		
DU5-SU4	-112.26527	41.40042	6/25/2018			X					X			X														
DU5-SU4	-112.25340	41.41838	6/25/2018			X					X							X										
DU5-SU4	-112.25340	41.40940	6/25/2018			X					X							X										

Sample ID	Longitude	Latitude	Date	V	SV	NV	TC	MC	SC	NC	ETC	EMC	ESC	VF	COL	COM	COS	SA	B	SND	BM	EBM	BH	HAL	GYP	HEX	CIR	MR
DU5-SU5	-112.41949	41.40491	5/30/2018						X									X										
DU5-SU5	-112.41356	41.40940	5/30/2018								X		X	X														
DU5-SU5	-112.40763	41.40491	5/30/2018						X									X										
DU5-SU5	-112.40170	41.40042	5/30/2018						X									X										
DU5-SU5	-112.40170	41.38694	5/30/2018								X			X												X		
DU5-SU5	-112.40170	41.38245	5/30/2018								X			X												X		
DU5-SU5	-112.40170	41.37796	5/30/2018								X			X												X		
DU5-SU5	-112.39577	41.39593	5/30/2018						X									X										
DU5-SU5	-112.39577	41.39144	5/30/2018						X									X										
DU5-SU5	-112.39577	41.38694	5/30/2018								X		X	X												X		
DU5-SU5	-112.39577	41.38245	5/30/2018								X		X	X												X		
DU5-SU5	-112.39577	41.37796	5/30/2018								X		X	X												X		
DU5-SU5	-112.38984	41.38694	5/30/2018								X							X								X		
DU5-SU5	-112.38984	41.38245	5/30/2018								X							X								X		
DU5-SU5	-112.38984	41.37796	5/30/2018								X							X								X		

Sample ID	Longitude	Latitude	Date	V	SV	NV	TC	MC	SC	NC	ETC	EMC	ESC	VF	COL	COM	COS	SA	B	SND	BM	EBM	BH	HAL	GYP	HEX	CIR	MR
DU5-SU6	-112.39576	41.51719	6/17/2018			X							X	X														
DU5-SU6	-112.39576	41.51270	6/17/2018			X						X		X														
DU5-SU6	-112.39576	41.50821	6/17/2018			X						X		X														
DU5-SU6	-112.39576	41.50372	6/17/2018			X						X		X														
DU5-SU6	-112.39576	41.49923	6/17/2018			X							X	X														
DU5-SU6	-112.39576	41.49474	6/17/2018			X							X	X														
DU5-SU6	-112.39576	41.49024	6/17/2018			X							X	X														
DU5-SU6	-112.39576	41.48575	6/17/2018			X							X	X														
DU5-SU6	-112.39576	41.48126	6/17/2018			X							X	X														
DU5-SU6	-112.39576	41.47677	6/17/2018			X							X	X														
DU5-SU6	-112.39576	41.47228	6/17/2018			X							X	X														
DU5-SU6	-112.39576	41.46779	6/17/2018			X							X	X														
DU5-SU6	-112.38983	41.51719	6/17/2018			X						X		X														
DU5-SU6	-112.38983	41.51270	6/17/2018			X						X		X														
DU5-SU6	-112.38983	41.50821	6/17/2018			X						X		X														
DU5-SU6	-112.38983	41.50372	6/17/2018			X						X		X														
DU5-SU6	-112.38983	41.49923	6/17/2018			X							X	X														
DU5-SU6	-112.38983	41.49474	6/17/2018			X							X	X														
DU5-SU6	-112.38983	41.49024	6/17/2018			X							X	X														
DU5-SU6	-112.38983	41.48575	6/17/2018			X							X	X														
DU5-SU6	-112.38983	41.48126	6/17/2018			X							X	X														
DU5-SU6	-112.38983	41.47677	6/17/2018			X							X	X														
DU5-SU6	-112.38983	41.47228	6/17/2018			X							X	X														
DU5-SU6	-112.38983	41.46779	6/17/2018		X						X			X				X										
DU5-SU6	-112.38390	41.51719	6/17/2018			X			X									X										
DU5-SU6	-112.38390	41.51270	6/17/2018			X			X									X										
DU5-SU6	-112.38390	41.50821	6/17/2018			X			X									X										
DU5-SU6	-112.38390	41.50372	6/17/2018			X							X	X														
DU5-SU6	-112.38390	41.49923	6/17/2018			X							X	X														
DU5-SU6	-112.38390	41.49474	6/17/2018			X							X	X														
DU5-SU6	-112.38390	41.49024	6/17/2018			X							X	X														
DU5-SU6	-112.38390	41.48575	6/17/2018			X							X	X														
DU5-SU6	-112.38390	41.48126	6/17/2018			X							X	X														
DU5-SU6	-112.38390	41.47677	6/17/2018			X							X	X														
DU5-SU6	-112.38390	41.47228	6/17/2018			X						X		X				X										
DU5-SU6	-112.38390	41.46779	6/17/2018		X				X									X	X									
DU5-SU6	-112.37797	41.51719	6/17/2018			X		X						X				X										
DU5-SU6	-112.37797	41.51270	6/17/2018	X																								
DU5-SU6	-112.37797	41.50821	6/17/2018	X																								
DU5-SU6	-112.37797	41.50372	6/17/2018			X							X	X														
DU5-SU6	-112.37797	41.49923	6/17/2018			X							X	X														
DU5-SU6	-112.37797	41.49474	6/17/2018			X							X	X														
DU5-SU6	-112.37797	41.49024	6/17/2018			X							X	X														
DU5-SU6	-112.37797	41.48575	6/17/2018			X							X	X														
DU5-SU6	-112.37797	41.48126	6/17/2018			X							X	X														
DU5-SU6	-112.37797	41.47677	6/17/2018			X							X	X														
DU5-SU6	-112.37797	41.47228	6/17/2018		X			X																				
DU5-SU6	-112.37204	41.51719	6/17/2018			X		X										X										
DU5-SU6	-112.37204	41.51270	6/17/2018	X																								
DU5-SU6	-112.37204	41.50821	6/17/2018	X																								
DU5-SU6	-112.37204	41.50372	6/17/2018			X							X	X														

Sample ID	Longitude	Latitude	Date	V	SV	NV	TC	MC	SC	NC	ETC	EMC	ESC	VF	COL	COM	COS	SA	B	SND	BM	EBM	BH	HAL	GYP	HEX	CIR	MR
DU5-SU6	-112.37204	41.49923	6/17/2018			X							X	X														
DU5-SU6	-112.37204	41.49474	6/17/2018			X							X	X														
DU5-SU6	-112.37204	41.49024	6/17/2018			X							X	X														
DU5-SU6	-112.37204	41.48575	6/17/2018			X							X	X														
DU5-SU6	-112.37204	41.48126	6/17/2018			X							X	X														
DU5-SU6	-112.37204	41.47677	6/17/2018			X					X		X	X														
DU5-SU6	-112.37204	41.47228	6/17/2018		X			X																				
DU5-SU6	-112.36611	41.51719	6/17/2018			X					X			X														
DU5-SU6	-112.36611	41.51270	6/17/2018			X						X		X														
DU5-SU6	-112.36611	41.50821	6/17/2018			X			X									X										
DU5-SU6	-112.36611	41.50372	6/17/2018			X							X	X														
DU5-SU6	-112.36611	41.49923	6/17/2018			X							X	X														
DU5-SU6	-112.36611	41.49474	6/17/2018			X							X	X														
DU5-SU6	-112.36611	41.49024	6/17/2018			X							X	X														
DU5-SU6	-112.36611	41.48575	6/17/2018			X							X	X														
DU5-SU6	-112.36611	41.48126	6/17/2018			X							X	X														
DU5-SU6	-112.36018	41.51719	6/17/2018	X																								
DU5-SU6	-112.36018	41.51270	6/17/2018			X						X		X														
DU5-SU6	-112.36018	41.50821	6/17/2018			X							X	X														
DU5-SU6	-112.36018	41.50372	6/17/2018			X							X	X														
DU5-SU6	-112.36018	41.49923	6/17/2018			X							X	X														
DU5-SU6	-112.36018	41.49474	6/17/2018			X							X	X														
DU5-SU6	-112.36018	41.49024	6/17/2018			X							X	X														
DU5-SU6	-112.36018	41.48575	6/17/2018			X							X	X														
DU5-SU6	-112.35425	41.51719	6/17/2018	X																								
DU5-SU6	-112.35425	41.51270	6/17/2018	X																								
DU5-SU6	-112.35425	41.50821	6/17/2018			X						X		X														
DU5-SU6	-112.35425	41.50372	6/17/2018			X						X		X														
DU5-SU6	-112.35425	41.49923	6/17/2018			X							X	X														
DU5-SU6	-112.35425	41.49474	6/17/2018			X							X	X														
DU5-SU6	-112.35425	41.49024	6/17/2018			X						X		X														
DU5-SU6	-112.34832	41.51719	6/17/2018		X							X		X														
DU5-SU6	-112.34832	41.51270	6/17/2018			X							X	X														
DU5-SU6	-112.34832	41.50821	6/17/2018			X							X	X														
DU5-SU6	-112.34832	41.50372	6/17/2018		X						X			X				X								X		
DU5-SU6	-112.34832	41.49474	6/17/2018			X							X	X														
DU5-SU6	-112.34832	41.49024	6/17/2018			X					X		X	X														

Sample ID	Longitude	Latitude	Date	V	SV	NV	TC	MC	SC	NC	ETC	EMC	ESC	VF	COL	COM	COS	SA	B	SND	BM	EBM	BH	HAL	GYP	HEX	CIR	MR
DU5-SU7	-112.43728	41.48126	6/8/2018			X					X			X														
DU5-SU7	-112.43728	41.47677	6/8/2018			X					X			X														
DU5-SU7	-112.43135	41.48126	6/8/2018		X								X	X														
DU5-SU7	-112.43135	41.47677	6/8/2018			X						X		X														
DU5-SU7	-112.43135	41.47228	6/8/2018			X						X		X														
DU5-SU7	-112.43135	41.46779	6/8/2018			X						X		X														
DU5-SU7	-112.43135	41.46330	6/8/2018			X					X							X										
DU5-SU7	-112.43135	41.45881	6/8/2018			X					X																	
DU5-SU7	-112.43135	41.44084	6/8/2018			X			X							X	X	X										
DU5-SU7	-112.43135	41.43635	6/8/2018		X						X			X														
DU5-SU7	-112.43135	41.43186	6/8/2018			X			X									X										
DU5-SU7	-112.43135	41.42737	6/8/2018			X			X							X		X										
DU5-SU7	-112.43135	41.42288	6/8/2018		X						X			X														
DU5-SU7	-112.42542	41.48126	6/8/2018			X							X	X														
DU5-SU7	-112.42542	41.47677	6/8/2018			X							X	X														
DU5-SU7	-112.42542	41.47228	6/8/2018			X							X	X														
DU5-SU7	-112.42542	41.46779	6/8/2018			X							X	X														
DU5-SU7	-112.42542	41.46330	6/8/2018			X						X		X														
DU5-SU7	-112.42542	41.45881	6/8/2018			X						X		X														
DU5-SU7	-112.42542	41.45431	6/8/2018		X						X							X										
DU5-SU7	-112.42542	41.44982	6/8/2018			X					X		X	X														
DU5-SU7	-112.42542	41.44533	6/8/2018		X						X			X														
DU5-SU7	-112.42542	41.44084	6/8/2018			X		X										X								X		
DU5-SU7	-112.42542	41.43635	6/8/2018			X						X		X														
DU5-SU7	-112.42542	41.43186	6/8/2018			X						X		X														
DU5-SU7	-112.42542	41.42737	6/8/2018			X							X	X														
DU5-SU7	-112.42542	41.42288	6/8/2018			X							X	X														
DU5-SU7	-112.41949	41.48126	6/8/2018			X							X	X														
DU5-SU7	-112.41949	41.47677	6/8/2018			X							X	X														
DU5-SU7	-112.41949	41.47228	6/8/2018			X							X	X														
DU5-SU7	-112.41949	41.46779	6/8/2018			X							X	X														
DU5-SU7	-112.41949	41.46330	6/8/2018			X							X	X														
DU5-SU7	-112.41949	41.45881	6/8/2018			X							X	X														
DU5-SU7	-112.41949	41.45431	6/8/2018			X							X	X													X	
DU5-SU7	-112.41949	41.44982	6/8/2018			X					X		X	X														
DU5-SU7	-112.41949	41.44533	6/8/2018			X					X			X				X										
DU5-SU7	-112.41949	41.44084	6/8/2018		X				X																	X		
DU5-SU7	-112.41949	41.42287	6/8/2018			X							X	X				X										
DU5-SU7	-112.41949	41.41838	6/8/2018			X							X	X														
DU5-SU7	-112.41949	41.41389	6/8/2018			X			X									X										
DU5-SU7	-112.41356	41.48126	6/8/2018			X							X	X														
DU5-SU7	-112.41356	41.47677	6/8/2018			X							X	X														
DU5-SU7	-112.41356	41.47228	6/8/2018			X							X	X														
DU5-SU7	-112.41356	41.46779	6/8/2018			X						X		X														
DU5-SU7	-112.41356	41.46330	6/8/2018			X						X		X														
DU5-SU7	-112.41356	41.45881	6/8/2018			X							X	X														
DU5-SU7	-112.41356	41.41389	6/8/2018		X						X															X	X	
DU5-SU7	-112.40763	41.48126	6/8/2018			X							X	X														
DU5-SU7	-112.40763	41.47677	6/8/2018			X							X	X														
DU5-SU7	-112.40763	41.47228	6/8/2018			X							X	X														
DU5-SU7	-112.40763	41.46779	6/8/2018			X						X		X														
DU5-SU7	-112.40763	41.46330	6/8/2018			X						X		X														
DU5-SU7	-112.40763	41.45881	6/8/2018		X						X							X										
DU5-SU7	-112.40170	41.48126	6/8/2018			X							X	X														
DU5-SU7	-112.40170	41.47677	6/8/2018			X							X	X														
DU5-SU7	-112.40170	41.47228	6/8/2018			X							X	X														
DU5-SU7	-112.40170	41.46779	6/8/2018			X						X		X														
DU5-SU7	-112.40170	41.46330	6/8/2018		X						X							X										

Sample ID	Longitude	Latitude	Date	V	SV	NV	TC	MC	SC	NC	ETC	EMC	ESC	VF	COL	COM	COS	SA	B	SND	BM	EBM	BH	HAL	GYP	HEX	CIR	MR
DU5-SU8	-112.44321	41.51719	6/10/2018		X						X			X														
DU5-SU8	-112.44321	41.51270	6/10/2018			X					X			X														
DU5-SU8	-112.44321	41.50821	6/10/2018			X					X			X												X		
DU5-SU8	-112.44321	41.50372	6/10/2018		X							X		X														
DU5-SU8	-112.44321	41.49923	6/10/2018		X							X		X														
DU5-SU8	-112.44321	41.49474	6/10/2018			X					X			X												X		
DU5-SU8	-112.44321	41.49024	6/10/2018			X					X			X												X		
DU5-SU8	-112.43728	41.51719	6/10/2018			X					X			X												X		
DU5-SU8	-112.43728	41.51270	6/10/2018			X					X		X	X												X		
DU5-SU8	-112.43728	41.50821	6/10/2018			X						X		X														
DU5-SU8	-112.43728	41.50372	6/10/2018			X					X			X												X		
DU5-SU8	-112.43728	41.49923	6/10/2018		X			X						X														
DU5-SU8	-112.43728	41.49474	6/10/2018			X						X		X														
DU5-SU8	-112.43728	41.49024	6/10/2018			X							X	X														
DU5-SU8	-112.43728	41.48575	6/10/2018			X							X	X														
DU5-SU8	-112.43135	41.51719	6/10/2018			X					X			X												X		
DU5-SU8	-112.43135	41.51270	6/10/2018			X					X			X												X		
DU5-SU8	-112.43135	41.50821	6/10/2018			X						X		X														
DU5-SU8	-112.43135	41.50372	6/10/2018			X						X		X														
DU5-SU8	-112.43135	41.49923	6/10/2018			X						X		X														
DU5-SU8	-112.43135	41.49474	6/10/2018			X						X		X														
DU5-SU8	-112.43135	41.49024	6/10/2018			X						X		X														
DU5-SU8	-112.43135	41.48575	6/10/2018			X						X		X														
DU5-SU8	-112.42542	41.51719	6/10/2018			X					X			X														
DU5-SU8	-112.42542	41.51270	6/10/2018			X					X			X														
DU5-SU8	-112.42542	41.50821	6/10/2018			X						X		X														
DU5-SU8	-112.42542	41.50372	6/10/2018			X						X		X														
DU5-SU8	-112.42542	41.49923	6/10/2018			X						X		X														
DU5-SU8	-112.42542	41.49474	6/10/2018			X						X		X														
DU5-SU8	-112.42542	41.49024	6/10/2018			X						X		X														
DU5-SU8	-112.42542	41.48575	6/10/2018			X						X		X														
DU5-SU8	-112.41949	41.51719	6/10/2018			X					X			X														
DU5-SU8	-112.41949	41.51270	6/10/2018			X					X			X														
DU5-SU8	-112.41949	41.50821	6/10/2018			X						X		X														
DU5-SU8	-112.41949	41.50372	6/10/2018			X						X		X														
DU5-SU8	-112.41949	41.49923	6/10/2018			X						X		X														
DU5-SU8	-112.41949	41.49474	6/10/2018			X						X		X														
DU5-SU8	-112.41949	41.49024	6/10/2018			X						X		X														
DU5-SU8	-112.41949	41.48575	6/10/2018			X						X		X														
DU5-SU8	-112.41356	41.51719	6/10/2018			X					X															X		
DU5-SU8	-112.41356	41.51270	6/10/2018			X					X			X												X		
DU5-SU8	-112.41356	41.50821	6/10/2018			X						X		X														
DU5-SU8	-112.41356	41.50372	6/10/2018			X						X		X														
DU5-SU8	-112.41356	41.49923	6/10/2018			X						X		X														
DU5-SU8	-112.41356	41.49474	6/10/2018			X						X		X														
DU5-SU8	-112.41356	41.49024	6/10/2018			X						X		X														
DU5-SU8	-112.41356	41.48575	6/10/2018			X						X		X														
DU5-SU8	-112.40763	41.51719	6/10/2018			X					X															X		
DU5-SU8	-112.40763	41.51270	6/10/2018			X					X															X		
DU5-SU8	-112.40763	41.50821	6/10/2018			X		X																				
DU5-SU8	-112.40763	41.50372	6/10/2018			X							X	X														
DU5-SU8	-112.40763	41.49923	6/10/2018			X							X	X														
DU5-SU8	-112.40763	41.49474	6/10/2018			X							X	X														
DU5-SU8	-112.40763	41.49024	6/10/2018			X							X	X														
DU5-SU8	-112.40763	41.48575	6/10/2018			X							X	X														
DU5-SU8	-112.40170	41.51719	6/10/2018			X					X			X												X		
DU5-SU8	-112.40170	41.51270	6/10/2018			X					X			X												X		
DU5-SU8	-112.40170	41.50821	6/10/2018			X						X		X														
DU5-SU8	-112.40170	41.50372	6/10/2018			X							X	X														
DU5-SU8	-112.40170	41.49923	6/10/2018			X							X	X														
DU5-SU8	-112.40170	41.49474	6/10/2018			X							X	X														
DU5-SU8	-112.40170	41.49024	6/10/2018			X							X	X														
DU5-SU8	-112.40170	41.48575	6/10/2018			X							X	X														

Sample ID	Longitude	Latitude	Date	V	SV	NV	TC	MC	SC	NC	ETC	EMC	ESC	VF	COL	COM	COS	SA	B	SND	BM	EBM	BH	HAL	GYP	HEX	CIR	MR
DU5-SU9	-112.44321	41.52618	6/26/2018		X			X										X										
DU5-SU9	-112.44321	41.52169	6/26/2018		X				X									X										
DU5-SU9	-112.43728	41.53067	6/26/2018			X			X									X										
DU5-SU9	-112.43728	41.52618	6/26/2018		X							X		X														
DU5-SU9	-112.43728	41.52169	6/26/2018		X						X			X												X		
DU5-SU9	-112.43135	41.54414	6/26/2018			X			X									X										
DU5-SU9	-112.43135	41.53965	6/26/2018			X		X						X				X										
DU5-SU9	-112.43135	41.53516	6/26/2018			X			X									X										
DU5-SU9	-112.43135	41.53067	6/26/2018			X			X									X										
DU5-SU9	-112.43135	41.52618	6/26/2018			X					X			X				X								X		
DU5-SU9	-112.43135	41.52169	6/26/2018			X					X		X	X												X		
DU5-SU9	-112.42542	41.55312	6/26/2018			X			X									X										
DU5-SU9	-112.42542	41.54863	6/26/2018			X			X									X										
DU5-SU9	-112.42542	41.54414	6/26/2018			X			X									X										
DU5-SU9	-112.42542	41.53965	6/26/2018			X		X										X										
DU5-SU9	-112.42542	41.53516	6/26/2018			X					X			X				X								X		
DU5-SU9	-112.42542	41.53067	6/26/2018			X					X			X				X								X		
DU5-SU9	-112.42542	41.52617	6/26/2018			X					X			X												X		
DU5-SU9	-112.42542	41.52168	6/26/2018		X						X			X				X								X		
DU5-SU9	-112.41949	41.55312	6/26/2018	X																								
DU5-SU9	-112.41949	41.54863	6/26/2018	X																								
DU5-SU9	-112.41949	41.54414	6/26/2018			X		X										X										
DU5-SU9	-112.41949	41.53965	6/26/2018			X			X									X										
DU5-SU9	-112.41949	41.53516	6/26/2018		X				X									X										
DU5-SU9	-112.41949	41.53067	6/26/2018			X					X			X				X								X		
DU5-SU9	-112.41949	41.52617	6/26/2018			X					X			X				X								X		
DU5-SU9	-112.41949	41.52168	6/26/2018			X					X							X								X		
DU5-SU9	-112.41356	41.55312	6/26/2018	X																								
DU5-SU9	-112.41356	41.54863	6/26/2018	X																								
DU5-SU9	-112.41356	41.54414	6/26/2018	X																								
DU5-SU9	-112.41356	41.53965	6/26/2018			X		X						X				X										
DU5-SU9	-112.41356	41.53516	6/26/2018			X					X			X				X								X		
DU5-SU9	-112.41356	41.53067	6/26/2018			X					X			X												X		
DU5-SU9	-112.41356	41.52617	6/26/2018			X					X			X				X								X		
DU5-SU9	-112.41356	41.52168	6/26/2018			X					X			X				X								X		
DU5-SU9	-112.40763	41.55312	6/26/2018		X						X			X				X								X		
DU5-SU9	-112.40763	41.54863	6/26/2018		X				X									X										
DU5-SU9	-112.40763	41.54414	6/26/2018			X			X									X										
DU5-SU9	-112.40763	41.53965	6/26/2018			X					X			X				X								X		
DU5-SU9	-112.40763	41.53516	6/26/2018			X			X									X										
DU5-SU9	-112.40763	41.53067	6/26/2018			X					X			X												X		
DU5-SU9	-112.40763	41.52617	6/26/2018			X			X									X										
DU5-SU9	-112.40763	41.52168	6/26/2018			X					X			X				X								X		
DU5-SU9	-112.40170	41.55312	6/26/2018			X					X			X												X		
DU5-SU9	-112.40170	41.54863	6/26/2018			X			X									X										
DU5-SU9	-112.40170	41.54414	6/26/2018		X						X			X												X		
DU5-SU9	-112.40170	41.53965	6/26/2018			X					X			X				X								X		
DU5-SU9	-112.40170	41.53516	6/26/2018		X						X			X				X								X		
DU5-SU9	-112.40170	41.53067	6/26/2018			X					X			X				X								X		
DU5-SU9	-112.40170	41.52617	6/26/2018			X					X			X				X								X		
DU5-SU9	-112.40170	41.52168	6/26/2018			X					X			X				X								X		

Sample ID	Longitude	Latitude	Date	V	SV	NV	TC	MC	SC	NC	ETC	EMC	ESC	VF	COL	COM	COS	SA	B	SND	BM	EBM	BH	HAL	GYP	HEX	CIR	MR
DU5-SU10	-112.39576	41.55312	6/17/2018			X					X			X				X										
DU5-SU10	-112.39576	41.54863	6/17/2018		X						X			X				X										
DU5-SU10	-112.39576	41.54414	6/17/2018			X		X										X										
DU5-SU10	-112.39576	41.53965	6/17/2018		X		X											X			X							
DU5-SU10	-112.39576	41.53516	6/17/2018			X			X									X										
DU5-SU10	-112.39576	41.53067	6/17/2018			X					X			X				X										
DU5-SU10	-112.39576	41.52617	6/17/2018			X	X											X			X							
DU5-SU10	-112.39576	41.52168	6/17/2018			X					X			X				X										
DU5-SU10	-112.38983	41.55312	6/17/2018			X			X									X										
DU5-SU10	-112.38983	41.54863	6/17/2018			X						X		X				X										
DU5-SU10	-112.38983	41.54414	6/17/2018			X			X									X										
DU5-SU10	-112.38983	41.53965	6/17/2018			X			X									X										
DU5-SU10	-112.38983	41.53516	6/17/2018			X	X											X			X							
DU5-SU10	-112.38983	41.53067	6/17/2018			X					X			X														
DU5-SU10	-112.38983	41.52617	6/17/2018			X					X			X				X										
DU5-SU10	-112.38983	41.52168	6/17/2018			X					X			X				X										
DU5-SU10	-112.38390	41.55312	6/17/2018			X			X									X										
DU5-SU10	-112.38390	41.54863	6/17/2018			X			X									X										
DU5-SU10	-112.38390	41.54414	6/17/2018			X			X									X										
DU5-SU10	-112.38390	41.53965	6/17/2018			X						X		X				X										
DU5-SU10	-112.38390	41.53516	6/17/2018			X			X									X										
DU5-SU10	-112.38390	41.53067	6/17/2018			X					X			X				X										
DU5-SU10	-112.38390	41.52617	6/17/2018			X			X									X										
DU5-SU10	-112.38390	41.52168	6/17/2018			X						X		X				X										
DU5-SU10	-112.37797	41.55312	6/17/2018			X					X		X	X														
DU5-SU10	-112.37797	41.54863	6/17/2018			X			X									X										
DU5-SU10	-112.37797	41.54414	6/17/2018			X							X	X				X										
DU5-SU10	-112.37797	41.53965	6/17/2018			X						X		X				X										
DU5-SU10	-112.37797	41.53516	6/17/2018			X						X		X				X										
DU5-SU10	-112.37797	41.53067	6/17/2018			X			X									X										
DU5-SU10	-112.37797	41.52617	6/17/2018			X					X			X				X										
DU5-SU10	-112.37797	41.52168	6/17/2018			X	X											X			X							
DU5-SU10	-112.37204	41.55312	6/17/2018	X																								
DU5-SU10	-112.37204	41.54863	6/17/2018			X					X			X				X										
DU5-SU10	-112.37204	41.54414	6/17/2018			X			X									X										
DU5-SU10	-112.37204	41.53965	6/17/2018			X						X		X				X										
DU5-SU10	-112.37204	41.53516	6/17/2018			X						X		X				X										
DU5-SU10	-112.37204	41.53067	6/17/2018			X						X		X				X										
DU5-SU10	-112.37204	41.52617	6/17/2018			X		X						X				X										
DU5-SU10	-112.37204	41.52168	6/17/2018			X		X						X				X										
DU5-SU10	-112.36611	41.55312	6/17/2018	X																								
DU5-SU10	-112.36611	41.54863	6/17/2018	X																								
DU5-SU10	-112.36611	41.54414	6/17/2018			X					X			X				X										
DU5-SU10	-112.36611	41.53965	6/17/2018			X					X			X				X										
DU5-SU10	-112.36611	41.53516	6/17/2018			X							X	X				X										
DU5-SU10	-112.36611	41.53067	6/17/2018			X						X		X				X										
DU5-SU10	-112.36611	41.52617	6/17/2018			X							X	X				X										
DU5-SU10	-112.36611	41.52168	6/17/2018			X		X						X				X										
DU5-SU10	-112.36018	41.55312	6/17/2018			X						X		X														
DU5-SU10	-112.36018	41.54863	6/17/2018	X																								
DU5-SU10	-112.36018	41.54414	6/17/2018			X			X									X										

Sample ID	Longitude	Latitude	Date	V	SV	NV	TC	MC	SC	NC	ETC	EMC	ESC	VF	COL	COM	COS	SA	B	SND	BM	EBM	BH	HAL	GYP	HEX	CIR	MR
DU5-SU10	-112.36018	41.53965	6/17/2018			X			X									X										
DU5-SU10	-112.36018	41.53516	6/17/2018			X					X		X	X														
DU5-SU10	-112.36018	41.53067	6/17/2018			X						X		X				X										
DU5-SU10	-112.36018	41.52617	6/17/2018			X							X	X														
DU5-SU10	-112.36018	41.52168	6/17/2018			X						X		X				X										
DU5-SU10	-112.35425	41.55312	6/17/2018			X					X			X														
DU5-SU10	-112.35425	41.54863	6/17/2018			X					X			X														
DU5-SU10	-112.35425	41.54414	6/17/2018	X																								
DU5-SU10	-112.35425	41.53965	6/17/2018			X						X		X														
DU5-SU10	-112.35425	41.53516	6/17/2018			X						X		X														
DU5-SU10	-112.35425	41.53067	6/17/2018			X							X	X														
DU5-SU10	-112.35425	41.52617	6/17/2018			X			X									X										
DU5-SU10	-112.35425	41.52168	6/17/2018			X						X		X				X										
DU5-SU10	-112.34832	41.55312	6/17/2018			X						X		X				X										
DU5-SU10	-112.34832	41.54863	6/17/2018			X			X									X										
DU5-SU10	-112.34832	41.54414	6/17/2018			X		X										X										
DU5-SU10	-112.34832	41.53965	6/17/2018			X						X		X				X										
DU5-SU10	-112.34832	41.53516	6/17/2018			X			X									X										
DU5-SU10	-112.34832	41.53067	6/17/2018			X						X		X				X										
DU5-SU10	-112.34832	41.52617	6/17/2018			X						X		X				X										
DU5-SU10	-112.34832	41.52168	6/17/2018			X						X		X				X										

Sample ID	Longitude	Latitude	Date	V	SV	NV	TC	MC	SC	NC	ETC	EMC	ESC	VF	COL	COM	COS	SA	B	SND	BM	EBM	BH	HAL	GYP	HEX	CIR	MR
DU5-SU11	-112.34238	41.54863	6/15/2018		X						X			X														
DU5-SU11	-112.34238	41.54414	6/15/2018			X					X							X										
DU5-SU11	-112.34238	41.53965	6/15/2018			X					X		X	X														
DU5-SU11	-112.34238	41.53516	6/15/2018			X					X	X		X														
DU5-SU11	-112.34238	41.53067	6/15/2018			X						X		X														
DU5-SU11	-112.34238	41.52618	6/15/2018			X					X		X	X														
DU5-SU11	-112.34238	41.52168	6/15/2018			X							X	X														
DU5-SU11	-112.34238	41.51719	6/15/2018			X							X	X														
DU5-SU11	-112.34238	41.51270	6/15/2018			X							X	X														
DU5-SU11	-112.34238	41.50821	6/15/2018			X							X	X														
DU5-SU11	-112.34238	41.50372	6/15/2018			X					X		X	X														
DU5-SU11	-112.34238	41.49923	6/15/2018			X					X							X										
DU5-SU11	-112.33645	41.53516	6/15/2018		X						X																	
DU5-SU11	-112.33645	41.53067	6/15/2018		X						X		X	X														
DU5-SU11	-112.33645	41.52618	6/15/2018			X					X	X		X														
DU5-SU11	-112.33645	41.52168	6/15/2018			X							X	X														
DU5-SU11	-112.33645	41.51719	6/15/2018			X							X	X														
DU5-SU11	-112.33645	41.51270	6/15/2018			X							X	X														
DU5-SU11	-112.33645	41.50821	6/15/2018			X							X	X														
DU5-SU11	-112.33645	41.50372	6/15/2018			X					X		X	X														
DU5-SU11	-112.33052	41.53516	6/15/2018		X						X		X	X														
DU5-SU11	-112.33052	41.53067	6/15/2018			X					X		X	X														
DU5-SU11	-112.33052	41.52618	6/15/2018			X					X		X	X												X		
DU5-SU11	-112.33052	41.52168	6/15/2018			X					X		X	X														
DU5-SU11	-112.33052	41.51719	6/15/2018		X				X					X														
DU5-SU11	-112.33052	41.51270	6/15/2018		X						X		X	X														
DU5-SU11	-112.33052	41.50821	6/15/2018			X					X		X	X														
DU5-SU11	-112.33052	41.50372	6/15/2018			X		X										X										
DU5-SU11	-112.32459	41.53516	6/15/2018		X						X																	
DU5-SU11	-112.32459	41.53067	6/15/2018		X						X		X	X														
DU5-SU11	-112.32459	41.52618	6/15/2018		X						X		X	X														
DU5-SU11	-112.32459	41.52168	6/15/2018			X							X	X														
DU5-SU11	-112.32459	41.51719	6/15/2018			X							X	X														
DU5-SU11	-112.32459	41.51270	6/15/2018		X						X		X	X														
DU5-SU11	-112.32459	41.50821	6/15/2018			X					X			X														
DU5-SU11	-112.32459	41.50372	6/15/2018		X				X																			
DU5-SU11	-112.31866	41.53516	6/15/2018		X						X							X										
DU5-SU11	-112.31866	41.53067	6/15/2018		X						X		X	X				X										
DU5-SU11	-112.31866	41.52618	6/15/2018		X						X		X	X												X		
DU5-SU11	-112.31866	41.52168	6/15/2018			X					X		X	X														
DU5-SU11	-112.31866	41.51719	6/15/2018			X					X		X	X														
DU5-SU11	-112.31866	41.51270	6/15/2018			X					X		X	X												X		
DU5-SU11	-112.31866	41.50821	6/15/2018			X					X			X														
DU5-SU11	-112.31273	41.52168	6/15/2018		X						X		X	X												X		
DU5-SU11	-112.31273	41.51719	6/15/2018		X						X		X	X														
DU5-SU11	-112.31273	41.51270	6/15/2018		X						X		X	X														
DU5-SU11	-112.31273	41.50821	6/15/2018		X						X							X										

Sample ID	Longitude	Latitude	Date	V	SV	NV	TC	MC	SC	NC	ETC	EMC	ESC	VF	COL	COM	COS	SA	B	SND	BM	EBM	BH	HAL	GYP	HEX	CIR	MR
DU5-SU12	-112.43135	41.57558	6/12/2018			X			X									X										
DU5-SU12	-112.43135	41.56660	6/12/2018			X			X									X										
DU5-SU12	-112.43135	41.56211	6/12/2018		X								X	X				X										
DU5-SU12	-112.43135	41.55762	6/12/2018			X			X									X										X
DU5-SU12	-112.42542	41.57558	6/12/2018		X						X			X				X								X		
DU5-SU12	-112.42542	41.57109	6/12/2018		X							X		X				X										
DU5-SU12	-112.42542	41.56660	6/12/2018			X			X									X										
DU5-SU12	-112.42542	41.56211	6/12/2018			X		X						X				X										
DU5-SU12	-112.42542	41.55762	6/12/2018			X		X						X				X										
DU5-SU12	-112.41949	41.58456	6/12/2018		X						X			X												X		
DU5-SU12	-112.41949	41.58007	6/12/2018			X					X			X				X								X		
DU5-SU12	-112.41949	41.57558	6/12/2018			X			X									X										
DU5-SU12	-112.41949	41.57109	6/12/2018		X				X									X	X									
DU5-SU12	-112.41949	41.56660	6/12/2018			X			X									X										
DU5-SU12	-112.41949	41.56211	6/12/2018			X		X						X				X										
DU5-SU12	-112.41949	41.55762	6/12/2018			X		X						X				X										
DU5-SU12	-112.41356	41.58456	6/12/2018			X		X						X				X										
DU5-SU12	-112.41356	41.58007	6/12/2018			X		X						X				X										
DU5-SU12	-112.41356	41.57558	6/12/2018		X				X									X										
DU5-SU12	-112.41356	41.57109	6/12/2018			X					X			X				X										
DU5-SU12	-112.41356	41.56660	6/12/2018	X																								
DU5-SU12	-112.41356	41.56211	6/12/2018		X				X									X										
DU5-SU12	-112.41356	41.55762	6/12/2018		X				X									X										
DU5-SU12	-112.40763	41.58906	6/12/2018		X				X									X										
DU5-SU12	-112.40763	41.58456	6/12/2018			X			X									X										
DU5-SU12	-112.40763	41.58007	6/12/2018			X					X			X				X								X		
DU5-SU12	-112.40763	41.57558	6/12/2018			X			X									X										
DU5-SU12	-112.40763	41.57109	6/12/2018			X					X			X				X										
DU5-SU12	-112.40763	41.56660	6/12/2018		X								X	X														X
DU5-SU12	-112.40763	41.56211	6/12/2018		X						X			X												X		
DU5-SU12	-112.40763	41.55762	6/12/2018		X						X			X												X		
DU5-SU12	-112.40170	41.58906	6/12/2018			X		X						X				X										
DU5-SU12	-112.40170	41.58456	6/12/2018			X		X						X			X	X										
DU5-SU12	-112.40170	41.58007	6/12/2018			X					X			X				X								X		
DU5-SU12	-112.40170	41.57558	6/12/2018			X					X			X				X								X		
DU5-SU12	-112.40170	41.57109	6/12/2018			X			X									X										
DU5-SU12	-112.40170	41.56660	6/12/2018			X		X										X										X
DU5-SU12	-112.40170	41.56211	6/12/2018			X					X			X		X										X		
DU5-SU12	-112.40170	41.55762	6/12/2018			X					X			X		X										X		X

Sample ID	Longitude	Latitude	Date	V	SV	NV	TC	MC	SC	NC	ETC	EMC	ESC	VF	COL	COM	COS	SA	B	SND	BM	EBM	BH	HAL	GYP	HEX	CIR	MR
DU5-SU13	-112.39576	41.58906	6/16/2018			X			X									X										
DU5-SU13	-112.39576	41.58457	6/16/2018			X						X		X														
DU5-SU13	-112.39576	41.58008	6/16/2018			X						X						X										
DU5-SU13	-112.39576	41.57559	6/16/2018			X						X		X				X										
DU5-SU13	-112.39576	41.57110	6/16/2018			X			X									X										
DU5-SU13	-112.39576	41.56661	6/16/2018	X																								
DU5-SU13	-112.39576	41.56211	6/16/2018			X			X									X										
DU5-SU13	-112.39576	41.55762	6/16/2018			X					X			X				X										
DU5-SU13	-112.38983	41.58906	6/16/2018		X				X									X										
DU5-SU13	-112.38983	41.58457	6/16/2018		X								X	X				X										
DU5-SU13	-112.38983	41.58008	6/16/2018			X			X									X										
DU5-SU13	-112.38983	41.57559	6/16/2018			X					X																	
DU5-SU13	-112.38983	41.57110	6/16/2018			X					X							X										
DU5-SU13	-112.38983	41.56661	6/16/2018			X			X									X										
DU5-SU13	-112.38983	41.56211	6/16/2018			X			X									X										
DU5-SU13	-112.38983	41.55762	6/16/2018			X			X									X										
DU5-SU13	-112.38390	41.58906	6/16/2018			X							X	X				X										
DU5-SU13	-112.38390	41.58457	6/16/2018	X																								
DU5-SU13	-112.38390	41.58008	6/16/2018			X					X			X				X										
DU5-SU13	-112.38390	41.57559	6/16/2018	X																								
DU5-SU13	-112.38390	41.57110	6/16/2018	X																								
DU5-SU13	-112.38390	41.56661	6/16/2018			X			X									X										
DU5-SU13	-112.38390	41.56211	6/16/2018			X			X									X										
DU5-SU13	-112.38390	41.55762	6/16/2018			X			X									X										
DU5-SU13	-112.37797	41.58906	6/16/2018			X					X							X										
DU5-SU13	-112.37797	41.58457	6/16/2018			X		X						X				X										
DU5-SU13	-112.37797	41.58008	6/16/2018		X				X									X										
DU5-SU13	-112.37797	41.57559	6/16/2018			X		X						X				X										
DU5-SU13	-112.37797	41.57110	6/16/2018			X		X						X				X										
DU5-SU13	-112.37797	41.56661	6/16/2018			X						X		X				X										
DU5-SU13	-112.37797	41.56211	6/16/2018			X			X									X										
DU5-SU13	-112.37797	41.55762	6/16/2018			X			X									X										
DU5-SU13	-112.37204	41.58906	6/16/2018			X			X									X										
DU5-SU13	-112.37204	41.58457	6/16/2018			X			X									X										
DU5-SU13	-112.37204	41.58008	6/16/2018	X																								
DU5-SU13	-112.37204	41.57559	6/16/2018	X																								
DU5-SU13	-112.37204	41.57110	6/16/2018	X																								
DU5-SU13	-112.37204	41.56661	6/16/2018	X																								
DU5-SU13	-112.37204	41.56211	6/16/2018			X			X									X										
DU5-SU13	-112.37204	41.55762	6/16/2018			X			X									X										
DU5-SU13	-112.36611	41.58906	6/16/2018			X			X					X				X										
DU5-SU13	-112.36611	41.58457	6/16/2018			X					X			X				X										
DU5-SU13	-112.36611	41.58008	6/16/2018			X		X						X				X										
DU5-SU13	-112.36611	41.57559	6/16/2018	X																								
DU5-SU13	-112.36611	41.57110	6/16/2018	X																								
DU5-SU13	-112.36611	41.56661	6/16/2018	X																								
DU5-SU13	-112.36611	41.56211	6/16/2018	X																								
DU5-SU13	-112.36611	41.55762	6/16/2018	X																								
DU5-SU13	-112.36018	41.58906	6/16/2018		X				X																			
DU5-SU13	-112.36018	41.58457	6/16/2018			X					X			X				X										
DU5-SU13	-112.36018	41.58008	6/16/2018		X							X		X				X										
DU5-SU13	-112.36018	41.57559	6/16/2018			X		X						X				X										
DU5-SU13	-112.36018	41.57110	6/16/2018			X		X						X				X										
DU5-SU13	-112.36018	41.56661	6/16/2018	X																								
DU5-SU13	-112.36018	41.56211	6/16/2018	X																								
DU5-SU13	-112.36018	41.55762	6/16/2018	X																								
DU5-SU13	-112.35425	41.58906	6/16/2018	X																								
DU5-SU13	-112.35425	41.58457	6/16/2018	X																								
DU5-SU13	-112.35425	41.58008	6/16/2018	X																								
DU5-SU13	-112.35425	41.57559	6/16/2018		X						X			X														
DU5-SU13	-112.35425	41.57110	6/16/2018		X						X			X														X
DU5-SU13	-112.35425	41.56661	6/16/2018			X					X		X	X														

Sample ID	Longitude	Latitude	Date	V	SV	NV	TC	MC	SC	NC	ETC	EMC	ESC	VF	COL	COM	COS	SA	B	SND	BM	EBM	BH	HAL	GYP	HEX	CIR	MR
DU5-BRBR	-112.33169	41.44875	6/14/2018			X	X							X												X		

Sample ID	Longitude	Latitude	Date	V	SV	NV	TC	MC	SC	NC	ETC	EMC	ESC	VF	COL	COM	COS	SA	B	SND	BM	EBM	BH	HAL	GYP	HEX	CIR	MR
DU6-SU1	-112.69552	40.92413	4/10/2018		X						X			X														
DU6-SU1	-112.69552	40.91964	4/10/2018		X						X			X												X		
DU6-SU1	-112.68959	40.94658	4/10/2018			X				X				X			X											
DU6-SU1	-112.68959	40.94209	4/10/2018		X								X	X			X											
DU6-SU1	-112.68959	40.93760	4/10/2018		X					X				X		X	X											
DU6-SU1	-112.68959	40.93311	4/10/2018			X				X				X			X											
DU6-SU1	-112.68959	40.92862	4/10/2018			X				X				X			X											
DU6-SU1	-112.68959	40.92413	4/10/2018			X				X				X			X											
DU6-SU1	-112.68366	40.94658	4/10/2018			X				X				X			X											
DU6-SU1	-112.68366	40.94209	4/10/2018			X				X				X		X	X											
DU6-SU1	-112.68366	40.93760	4/10/2018		X					X				X		X	X											
DU6-SU1	-112.68366	40.93311	4/10/2018		X					X				X		X	X											
DU6-SU1	-112.68366	40.92862	4/10/2018			X				X				X			X											
DU6-SU1	-112.68366	40.92413	4/10/2018		X					X				X			X											
DU6-SU1	-112.67773	40.94658	4/10/2018		X					X					X	X												
DU6-SU1	-112.67773	40.94209	4/10/2018		X					X				X		X	X											
DU6-SU1	-112.67773	40.93760	4/10/2018		X					X				X		X	X											
DU6-SU1	-112.67773	40.93311	4/10/2018		X					X				X		X	X											
DU6-SU1	-112.67773	40.92862	4/10/2018		X					X				X		X	X											
DU6-SU1	-112.67180	40.94658	4/10/2018		X					X					X	X												
DU6-SU1	-112.67180	40.94209	4/10/2018		X					X				X		X	X											
DU6-SU1	-112.67180	40.93760	4/10/2018		X					X				X		X	X											
DU6-SU1	-112.67180	40.93311	4/10/2018		X								X	X			X											
DU6-SU1	-112.67180	40.92862	4/10/2018			X				X							X											
DU6-SU1	-112.66587	40.94658	4/10/2018		X					X						X	X											
DU6-SU1	-112.66587	40.94209	4/10/2018		X					X				X		X	X											
DU6-SU1	-112.66587	40.93760	4/10/2018		X					X				X		X	X											
DU6-SU1	-112.66587	40.93311	4/10/2018		X					X				X			X											
DU6-SU1	-112.65994	40.94658	4/10/2018			X				X						X	X											
DU6-SU1	-112.65994	40.94209	4/10/2018		X					X						X												
DU6-SU1	-112.65994	40.93760	4/10/2018			X			X							X	X											
DU6-SU1	-112.65994	40.93311	4/10/2018			X				X				X			X											
DU6-SU1	-112.65401	40.94658	4/10/2018			X			X					X														
DU6-SU1	-112.65401	40.94209	4/10/2018			X				X				X														
DU6-SU1	-112.65401	40.93760	4/10/2018			X			X								X											
DU6-SU1	-112.65401	40.93311	4/10/2018			X			X																			
DU6-SU1	-112.64808	40.94658	4/10/2018			X			X																			
DU6-SU1	-112.64808	40.94209	4/10/2018			X			X																			
DU6-SU1	-112.64808	40.93760	4/10/2018			X			X																			
DU6-SU1	-112.64808	40.93311	4/10/2018			X			X																			

Sample ID	Longitude	Latitude	Date	V	SV	NV	TC	MC	SC	NC	ETC	EMC	ESC	VF	COL	COM	COS	SA	B	SND	BM	EBM	BH	HAL	GYP	HEX	CIR	MR
DU6-SU2	-112.64213	40.94658	4/19/2018			X			X									X										
DU6-SU2	-112.64213	40.94209	4/19/2018			X			X									X										
DU6-SU2	-112.64213	40.93760	4/19/2018			X			X								X											
DU6-SU2	-112.64213	40.93311	4/19/2018			X			X							X	X											
DU6-SU2	-112.63620	40.94658	4/19/2018			X			X									X	X									
DU6-SU2	-112.63620	40.94209	4/19/2018			X			X									X										
DU6-SU2	-112.63620	40.93760	4/19/2018			X			X								X	X										
DU6-SU2	-112.63620	40.93311	4/19/2018			X			X								X											
DU6-SU2	-112.63027	40.94658	4/19/2018			X			X									X						X				
DU6-SU2	-112.63027	40.93760	4/19/2018			X			X								X	X										
DU6-SU2	-112.63027	40.93311	4/19/2018			X			X									X	X									
DU6-SU2	-112.62434	40.94658	4/19/2018			X			X								X	X										
DU6-SU2	-112.62434	40.94209	4/19/2018			X			X								X											
DU6-SU2	-112.62434	40.93760	4/19/2018			X			X								X	X										
DU6-SU2	-112.62434	40.93311	4/19/2018			X			X								X	X										
DU6-SU2	-112.61841	40.94658	4/19/2018			X				X				X			X											
DU6-SU2	-112.61841	40.94209	4/19/2018			X			X										X									
DU6-SU2	-112.61841	40.93760	4/19/2018			X			X								X	X										
DU6-SU2	-112.61841	40.93311	4/19/2018			X			X								X											
DU6-SU2	-112.61248	40.94658	4/19/2018			X			X								X											
DU6-SU2	-112.61248	40.94209	4/19/2018			X			X								X	X										
DU6-SU2	-112.61248	40.93760	4/19/2018			X			X								X											
DU6-SU2	-112.60655	40.94658	4/19/2018			X			X								X											
DU6-SU2	-112.60655	40.94209	4/19/2018			X			X								X	X										
DU6-SU2	-112.60655	40.93760	4/19/2018		X					X				X			X											
DU6-SU2	-112.60062	40.94658	4/19/2018			X			X								X		X									
DU6-SU2	-112.60062	40.94209	4/19/2018			X				X				X			X											
DU6-SU2	-112.59469	40.94658	4/19/2018			X			X									X										
DU6-SU2	-112.59469	40.94209	4/19/2018			X			X								X	X										
DU6-SU2	-112.58876	40.94209	4/19/2018			X			X								X	X										
DU6-SU2	-112.58283	40.94658	4/19/2018			X			X								X	X										
DU6-SU2	-112.58283	40.94209	4/19/2018			X			X								X	X										
DU6-SU2	-112.57690	40.94658	4/19/2018			X			X								X	X										
DU6-SU2	-112.57690	40.94209	4/19/2018			X				X				X		X	X											
DU6-SU2	-112.57097	40.94658	4/19/2018		X					X				X			X											
DU6-SU2	-112.55909	40.94658	4/19/2018			X			X								X											
DU6-SU2	-112.55316	40.94658	4/19/2018			X			X								X	X										
DU6-SU2	-112.55316	40.94209	4/19/2018			X			X								X		X									
DU6-SU2	-112.54723	40.94658	4/19/2018			X			X							X	X	X										
DU6-SU2	-112.54723	40.94209	4/19/2018			X			X								X											
DU6-SU2	-112.54723	40.93760	4/19/2018			X			X								X											

Sample ID	Longitude	Latitude	Date	V	SV	NV	TC	MC	SC	NC	ETC	EMC	ESC	VF	COL	COM	COS	SA	B	SND	BM	EBM	BH	HAL	GYP	HEX	CIR	MR
DU6-SU3	-112.68959	40.95557	4/15/2018			X				X							X											
DU6-SU3	-112.68959	40.95108	4/15/2018			X				X				X			X											
DU6-SU3	-112.68366	40.97353	4/15/2018			X			X								X		X									
DU6-SU3	-112.68366	40.96904	4/15/2018			X			X								X											
DU6-SU3	-112.68366	40.96455	4/15/2018			X			X								X											
DU6-SU3	-112.68366	40.96006	4/15/2018			X			X								X											
DU6-SU3	-112.68366	40.95557	4/15/2018			X			X								X		X									
DU6-SU3	-112.68366	40.95108	4/15/2018			X				X				X			X											
DU6-SU3	-112.67773	40.97802	4/15/2018			X			X								X											
DU6-SU3	-112.67773	40.97353	4/15/2018			X			X									X										
DU6-SU3	-112.67773	40.96904	4/15/2018			X			X								X											
DU6-SU3	-112.67773	40.96455	4/15/2018			X			X								X											
DU6-SU3	-112.67773	40.96006	4/15/2018			X			X								X											
DU6-SU3	-112.67773	40.95557	4/15/2018			X			X								X											
DU6-SU3	-112.67773	40.95108	4/15/2018			X				X				X			X											
DU6-SU3	-112.67180	40.97802	4/15/2018			X			X							X	X											
DU6-SU3	-112.67180	40.97353	4/15/2018			X			X									X	X									
DU6-SU3	-112.67180	40.96904	4/15/2018			X			X									X	X									
DU6-SU3	-112.67180	40.96455	4/15/2018			X			X									X	X									
DU6-SU3	-112.67180	40.96006	4/15/2018			X			X									X										
DU6-SU3	-112.67180	40.95557	4/15/2018			X			X							X	X											
DU6-SU3	-112.67180	40.95108	4/15/2018			X				X				X		X	X											
DU6-SU3	-112.66587	40.97802	4/15/2018		X					X				X		X	X											
DU6-SU3	-112.66587	40.97353	4/15/2018		X					X							X											
DU6-SU3	-112.66587	40.96904	4/15/2018			X			X									X										
DU6-SU3	-112.66587	40.96455	4/15/2018			X			X																			
DU6-SU3	-112.66587	40.96006	4/15/2018			X			X																			
DU6-SU3	-112.66587	40.95557	4/15/2018			X				X				X		X	X											
DU6-SU3	-112.66587	40.95108	4/15/2018			X				X				X		X	X											
DU6-SU3	-112.65994	40.97802	4/15/2018		X					X				X		X	X											
DU6-SU3	-112.65994	40.97353	4/15/2018		X					X				X		X	X											
DU6-SU3	-112.65994	40.96904	4/15/2018			X				X				X			X	X										
DU6-SU3	-112.65994	40.96455	4/15/2018			X			X																			
DU6-SU3	-112.65994	40.95108	4/15/2018			X				X				X		X	X											
DU6-SU3	-112.65401	40.97802	4/15/2018	X																								
DU6-SU3	-112.65401	40.97353	4/15/2018			X			X									X										
DU6-SU3	-112.65401	40.96904	4/15/2018			X			X									X										
DU6-SU3	-112.65401	40.96455	4/15/2018			X			X									X										
DU6-SU3	-112.65401	40.96006	4/15/2018			X			X								X											
DU6-SU3	-112.65401	40.95557	4/15/2018			X			X									X										
DU6-SU3	-112.65401	40.95108	4/15/2018			X			X									X										
DU6-SU3	-112.64808	40.97802	4/15/2018			X			X										X									
DU6-SU3	-112.64808	40.97353	4/15/2018			X			X									X	X									
DU6-SU3	-112.64808	40.96904	4/15/2018			X			X									X	X									
DU6-SU3	-112.64808	40.96455	4/15/2018			X			X									X	X									
DU6-SU3	-112.64808	40.96006	4/15/2018			X			X									X	X									
DU6-SU3	-112.64808	40.95557	4/15/2018			X			X									X	X									
DU6-SU3	-112.64808	40.95108	4/15/2018			X			X									X										

Sample ID	Longitude	Latitude	Date	V	SV	NV	TC	MC	SC	NC	ETC	EMC	ESC	VF	COL	COM	COS	SA	B	SND	BM	EBM	BH	HAL	GYP	HEX	CIR	MR
DU6-SU4	-112.64213	40.97802	4/19/2018			X			X									X	X									
DU6-SU4	-112.64213	40.97353	4/19/2018			X			X									X	X									
DU6-SU4	-112.64213	40.96904	4/19/2018			X			X								X		X									
DU6-SU4	-112.64213	40.96455	4/19/2018			X			X								X											
DU6-SU4	-112.64213	40.96006	4/19/2018			X			X								X											
DU6-SU4	-112.64213	40.95557	4/19/2018			X			X								X											
DU6-SU4	-112.64213	40.95107	4/19/2018			X			X									X										
DU6-SU4	-112.63620	40.97802	4/19/2018			X			X								X	X	X									
DU6-SU4	-112.63620	40.97353	4/19/2018			X			X									X										
DU6-SU4	-112.63620	40.96904	4/19/2018			X			X								X		X									
DU6-SU4	-112.63620	40.96455	4/19/2018			X			X									X										
DU6-SU4	-112.63620	40.96006	4/19/2018			X			X								X		X									
DU6-SU4	-112.63027	40.97802	4/19/2018			X			X								X	X										
DU6-SU4	-112.63027	40.97353	4/19/2018			X			X								X	X										
DU6-SU4	-112.63027	40.96904	4/19/2018			X			X								X		X									
DU6-SU4	-112.63027	40.96455	4/19/2018			X			X									X										
DU6-SU4	-112.63027	40.96006	4/19/2018			X			X								X		X									
DU6-SU4	-112.63027	40.95557	4/19/2018			X			X										X									
DU6-SU4	-112.63027	40.95107	4/19/2018			X			X								X	X	X									
DU6-SU4	-112.62434	40.97802	4/19/2018			X			X									X	X									
DU6-SU4	-112.62434	40.97353	4/19/2018			X			X								X											
DU6-SU4	-112.62434	40.96904	4/19/2018			X			X								X	X										
DU6-SU4	-112.62434	40.96455	4/19/2018			X			X								X											
DU6-SU4	-112.62434	40.96006	4/19/2018			X			X									X										
DU6-SU4	-112.62434	40.95557	4/19/2018			X			X									X	X									
DU6-SU4	-112.62434	40.95107	4/19/2018			X			X								X	X										
DU6-SU4	-112.61841	40.97802	4/19/2018			X			X								X		X									
DU6-SU4	-112.61841	40.97353	4/19/2018			X			X								X											
DU6-SU4	-112.61841	40.96904	4/19/2018			X			X								X	X										
DU6-SU4	-112.61841	40.96455	4/19/2018			X			X					X			X											
DU6-SU4	-112.61841	40.96006	4/19/2018		X					X				X			X											
DU6-SU4	-112.61841	40.95557	4/19/2018			X			X									X										
DU6-SU4	-112.61841	40.95107	4/19/2018			X			X								X											
DU6-SU4	-112.61248	40.97802	4/19/2018		X					X				X			X											
DU6-SU4	-112.61248	40.97353	4/19/2018			X			X									X										
DU6-SU4	-112.61248	40.96904	4/19/2018			X			X									X										
DU6-SU4	-112.61248	40.96455	4/19/2018		X					X							X											
DU6-SU4	-112.61248	40.96006	4/19/2018		X					X				X			X											
DU6-SU4	-112.61248	40.95557	4/19/2018			X			X									X										
DU6-SU4	-112.61248	40.95107	4/19/2018			X			X									X										
DU6-SU4	-112.60655	40.97802	4/19/2018			X			X										X									
DU6-SU4	-112.60655	40.97353	4/19/2018			X			X									X										
DU6-SU4	-112.60655	40.96904	4/19/2018			X				X							X											
DU6-SU4	-112.60655	40.96455	4/19/2018			X				X				X			X											
DU6-SU4	-112.60655	40.96006	4/19/2018			X				X				X			X											
DU6-SU4	-112.60655	40.95557	4/19/2018			X			X									X										
DU6-SU4	-112.60655	40.95107	4/19/2018			X			X									X										
DU6-SU4	-112.60062	40.97802	4/19/2018		X					X							X											
DU6-SU4	-112.60062	40.97353	4/19/2018			X			X																			
DU6-SU4	-112.60062	40.96904	4/19/2018			X			X								X											
DU6-SU4	-112.60062	40.96455	4/19/2018			X			X								X	X										
DU6-SU4	-112.60062	40.96006	4/19/2018			X			X										X									
DU6-SU4	-112.60062	40.95107	4/19/2018			X			X									X										

Sample ID	Longitude	Latitude	Date	V	SV	NV	TC	MC	SC	NC	ETC	EMC	ESC	VF	COL	COM	COS	SA	B	SND	BM	EBM	BH	HAL	GYP	HEX	CIR	MR
DU6-SU5	-112.59468	40.97802	4/21/2018	X																								
DU6-SU5	-112.59468	40.97353	4/21/2018			X			X								X	X										
DU6-SU5	-112.59468	40.96904	4/21/2018			X			X							X	X											
DU6-SU5	-112.59468	40.96455	4/21/2018			X			X								X	X										
DU6-SU5	-112.58875	40.97802	4/21/2018		X					X				X			X											
DU6-SU5	-112.58875	40.97353	4/21/2018			X			X					X			X											
DU6-SU5	-112.58875	40.96904	4/21/2018			X			X								X	X										
DU6-SU5	-112.58875	40.96455	4/21/2018			X			X								X	X										
DU6-SU5	-112.58875	40.96006	4/21/2018			X			X						X		X											
DU6-SU5	-112.58875	40.95557	4/21/2018			X			X								X	X										
DU6-SU5	-112.58875	40.95107	4/21/2018			X			X								X	X						X				
DU6-SU5	-112.58282	40.97802	4/21/2018		X					X				X			X											
DU6-SU5	-112.58282	40.97353	4/21/2018		X					X				X			X											
DU6-SU5	-112.58282	40.96904	4/21/2018			X			X								X	X										
DU6-SU5	-112.58282	40.96455	4/21/2018			X			X								X	X										
DU6-SU5	-112.58282	40.96006	4/21/2018			X			X								X	X										
DU6-SU5	-112.58282	40.95557	4/21/2018			X			X								X	X										
DU6-SU5	-112.58282	40.95107	4/21/2018			X			X								X	X										
DU6-SU5	-112.57689	40.97802	4/21/2018			X			X																			
DU6-SU5	-112.57689	40.97353	4/21/2018			X			X								X											
DU6-SU5	-112.57689	40.96904	4/21/2018			X			X								X	X										
DU6-SU5	-112.57689	40.96455	4/21/2018		X					X				X			X											
DU6-SU5	-112.57689	40.96006	4/21/2018			X			X									X										
DU6-SU5	-112.57689	40.95557	4/21/2018		X					X				X			X											
DU6-SU5	-112.57689	40.95107	4/21/2018			X			X								X	X										
DU6-SU5	-112.57096	40.97802	4/21/2018			X			X								X											
DU6-SU5	-112.57096	40.97353	4/21/2018			X			X								X											
DU6-SU5	-112.57096	40.96904	4/21/2018			X			X									X										
DU6-SU5	-112.57096	40.96455	4/21/2018			X			X								X	X										
DU6-SU5	-112.57096	40.96006	4/21/2018			X			X								X	X										
DU6-SU5	-112.57096	40.95557	4/21/2018			X			X								X	X										
DU6-SU5	-112.57096	40.95107	4/21/2018			X					X				X													
DU6-SU5	-112.56503	40.97802	4/21/2018		X				X								X											
DU6-SU5	-112.56503	40.97353	4/21/2018		X					X				X														
DU6-SU5	-112.56503	40.96904	4/21/2018			X			X								X	X										
DU6-SU5	-112.56503	40.96455	4/21/2018			X			X								X	X										
DU6-SU5	-112.56503	40.96006	4/21/2018			X			X								X	X										
DU6-SU5	-112.56503	40.95557	4/21/2018			X			X								X											
DU6-SU5	-112.56503	40.95107	4/21/2018			X			X								X											
DU6-SU5	-112.55910	40.97802	4/21/2018			X		X								X	X											
DU6-SU5	-112.55910	40.97353	4/21/2018			X			X					X			X											
DU6-SU5	-112.55910	40.96904	4/21/2018			X			X								X											
DU6-SU5	-112.55910	40.96455	4/21/2018			X			X								X											
DU6-SU5	-112.55910	40.96006	4/21/2018			X			X								X											
DU6-SU5	-112.55910	40.95557	4/21/2018		X					X				X			X											
DU6-SU5	-112.55910	40.95107	4/21/2018			X			X								X	X										
DU6-SU5	-112.55317	40.97802	4/21/2018			X			X					X			X											
DU6-SU5	-112.55317	40.97353	4/21/2018			X			X								X	X										
DU6-SU5	-112.55317	40.96904	4/21/2018		X					X				X														
DU6-SU5	-112.55317	40.96455	4/21/2018		X			X						X														
DU6-SU5	-112.55317	40.96006	4/21/2018			X			X									X										
DU6-SU5	-112.55317	40.95557	4/21/2018			X			X								X											
DU6-SU5	-112.55317	40.95107	4/21/2018			X			X									X	X									
DU6-SU5	-112.54724	40.97802	4/21/2018		X					X				X			X											
DU6-SU5	-112.54724	40.97353	4/21/2018		X					X				X			X											
DU6-SU5	-112.54724	40.96904	4/21/2018			X			X									X										
DU6-SU5	-112.54724	40.96455	4/21/2018			X			X																			
DU6-SU5	-112.54724	40.96006	4/21/2018			X			X									X										
DU6-SU5	-112.54724	40.95557	4/21/2018			X			X									X										
DU6-SU5	-112.54724	40.95107	4/21/2018			X			X									X										

Sample ID	Longitude	Latitude	Date	V	SV	NV	TC	MC	SC	NC	ETC	EMC	ESC	VF	COL	COM	COS	SA	B	SND	BM	EBM	BH	HAL	GYP	HEX	CIR	MR
DU6-SU6	-112.67772	41.00048	4/14/2018			X																	X					
DU6-SU6	-112.67772	40.99599	4/14/2018			X				X						X	X					X						
DU6-SU6	-112.67772	40.99150	4/14/2018			X			X																			
DU6-SU6	-112.67772	40.98701	4/14/2018			X			X						X													
DU6-SU6	-112.67772	40.98252	4/14/2018			X			X								X											
DU6-SU6	-112.67179	41.00946	4/14/2018			X			X								X						X					
DU6-SU6	-112.67179	41.00497	4/14/2018			X				X						X	X											
DU6-SU6	-112.67179	41.00048	4/14/2018			X			X							X	X											
DU6-SU6	-112.67179	40.98701	4/14/2018			X			X						X		X											
DU6-SU6	-112.67179	40.98252	4/14/2018			X				X						X	X											
DU6-SU6	-112.66586	41.00946	4/14/2018			X			X								X											
DU6-SU6	-112.66586	40.99599	4/14/2018			X				X						X			X									
DU6-SU6	-112.66586	40.99150	4/14/2018			X			X										X									
DU6-SU6	-112.66586	40.98701	4/14/2018			X			X									X										
DU6-SU6	-112.66586	40.98252	4/14/2018		X					X				X			X											
DU6-SU6	-112.65993	41.00048	4/14/2018		X						X																	
DU6-SU6	-112.65993	40.99599	4/14/2018			X			X								X											
DU6-SU6	-112.65993	40.99150	4/14/2018		X					X				X		X	X											
DU6-SU6	-112.65993	40.98701	4/14/2018		X					X				X			X											
DU6-SU6	-112.65993	40.98252	4/14/2018		X					X				X		X	X											
DU6-SU6	-112.65400	41.00946	4/14/2018			X				X									X									
DU6-SU6	-112.65400	41.00497	4/14/2018			X			X						X		X											
DU6-SU6	-112.65400	41.00048	4/14/2018		X					X				X		X	X											
DU6-SU6	-112.65400	40.99599	4/14/2018		X					X				X		X	X											
DU6-SU6	-112.65400	40.99150	4/14/2018		X					X				X		X	X											
DU6-SU6	-112.65400	40.98701	4/14/2018		X					X				X			X											
DU6-SU6	-112.65400	40.98251	4/14/2018		X					X				X			X											
DU6-SU6	-112.64807	41.03641	4/14/2018		X						X				X		X											
DU6-SU6	-112.64807	41.03192	4/14/2018			X					X				X		X											
DU6-SU6	-112.64807	41.02743	4/14/2018			X					X				X		X											
DU6-SU6	-112.64807	41.02294	4/14/2018			X					X				X													
DU6-SU6	-112.64807	41.01845	4/14/2018			X			X							X	X											
DU6-SU6	-112.64807	41.01396	4/14/2018			X			X						X		X											
DU6-SU6	-112.64807	41.00946	4/14/2018			X			X						X		X											
DU6-SU6	-112.64807	41.00497	4/14/2018		X					X							X											
DU6-SU6	-112.64807	41.00048	4/14/2018		X					X				X			X											
DU6-SU6	-112.64807	40.99599	4/14/2018		X					X				X		X	X											
DU6-SU6	-112.64807	40.99150	4/14/2018		X					X				X			X											
DU6-SU6	-112.64807	40.98701	4/14/2018			X			X									X	X									
DU6-SU6	-112.64807	40.98252	4/14/2018			X			X								X											

Sample ID	Longitude	Latitude	Date	V	SV	NV	TC	MC	SC	NC	ETC	EMC	ESC	VF	COL	COM	COS	SA	B	SND	BM	EBM	BH	HAL	GYP	HEX	CIR	MR
DU6-SU7	-112.64213	41.01395	5/20/2018		X					X				X			X											
DU6-SU7	-112.64213	41.00946	5/20/2018		X					X				X			X											
DU6-SU7	-112.64213	41.00497	5/20/2018		X					X				X		X	X											
DU6-SU7	-112.64213	41.00048	5/20/2018		X					X				X		X	X											
DU6-SU7	-112.64213	40.99599	5/20/2018		X					X				X			X											
DU6-SU7	-112.64213	40.99150	5/20/2018			X			X								X											
DU6-SU7	-112.64213	40.98700	5/20/2018			X			X							X		X	X									
DU6-SU7	-112.64213	40.98251	5/20/2018			X			X								X		X									
DU6-SU7	-112.63620	41.01395	5/20/2018		X					X				X			X											
DU6-SU7	-112.63620	41.00946	5/20/2018		X					X				X		X	X											
DU6-SU7	-112.63620	41.00497	5/20/2018		X					X				X		X	X											
DU6-SU7	-112.63620	41.00048	5/20/2018		X					X				X		X	X											
DU6-SU7	-112.63620	40.99599	5/20/2018		X				X					X						X								
DU6-SU7	-112.63620	40.99150	5/20/2018			X			X										X									
DU6-SU7	-112.63620	40.98700	5/20/2018			X			X									X										
DU6-SU7	-112.63620	40.98251	5/20/2018			X			X								X	X	X									
DU6-SU7	-112.63027	41.01395	5/20/2018		X					X				X			X											
DU6-SU7	-112.63027	41.00946	5/20/2018		X					X				X		X	X											
DU6-SU7	-112.63027	41.00497	5/20/2018			X			X								X		X									
DU6-SU7	-112.63027	41.00048	5/20/2018			X			X									X										
DU6-SU7	-112.63027	40.99599	5/20/2018			X			X									X	X									
DU6-SU7	-112.63027	40.99150	5/20/2018			X			X									X										
DU6-SU7	-112.63027	40.98700	5/20/2018			X			X							X	X	X	X									
DU6-SU7	-112.63027	40.98251	5/20/2018			X			X								X	X										
DU6-SU7	-112.62434	41.01395	5/20/2018			X			X								X											
DU6-SU7	-112.62434	41.00946	5/20/2018		X					X				X		X	X											
DU6-SU7	-112.62434	41.00497	5/20/2018			X			X								X											
DU6-SU7	-112.62434	41.00048	5/20/2018			X			X								X											
DU6-SU7	-112.62434	40.99599	5/20/2018			X			X								X											
DU6-SU7	-112.62434	40.99150	5/20/2018			X			X								X	X										
DU6-SU7	-112.62434	40.98700	5/20/2018			X			X									X	X									
DU6-SU7	-112.62434	40.98251	5/20/2018			X			X									X	X									
DU6-SU7	-112.61841	41.01395	5/20/2018			X			X								X											
DU6-SU7	-112.61841	41.00946	5/20/2018		X					X				X		X	X											
DU6-SU7	-112.61841	41.00497	5/20/2018			X			X									X										
DU6-SU7	-112.61841	41.00048	5/20/2018		X			X									X											
DU6-SU7	-112.61841	40.99599	5/20/2018		X					X				X			X											
DU6-SU7	-112.61841	40.99150	5/20/2018			X			X								X	X										
DU6-SU7	-112.61841	40.98700	5/20/2018			X			X								X	X										
DU6-SU7	-112.61841	40.98251	5/20/2018			X			X					X			X											
DU6-SU7	-112.61248	41.01395	5/20/2018			X			X								X	X										
DU6-SU7	-112.61248	41.00946	5/20/2018			X			X								X	X										
DU6-SU7	-112.61248	41.00497	5/20/2018			X			X									X										
DU6-SU7	-112.61248	41.00048	5/20/2018			X			X								X											
DU6-SU7	-112.61248	40.99599	5/20/2018			X			X									X										
DU6-SU7	-112.61248	40.99150	5/20/2018		X					X				X			X											
DU6-SU7	-112.61248	40.98700	5/20/2018		X					X				X			X											
DU6-SU7	-112.61248	40.98251	5/20/2018			X			X								X	X										
DU6-SU7	-112.60655	41.01395	5/20/2018		X					X				X		X	X											
DU6-SU7	-112.60655	41.00946	5/20/2018		X					X				X		X	X											
DU6-SU7	-112.60655	41.00497	5/20/2018			X			X									X										
DU6-SU7	-112.60655	41.00048	5/20/2018			X			X									X										
DU6-SU7	-112.60655	40.99599	5/20/2018		X					X				X			X											
DU6-SU7	-112.60655	40.99150	5/20/2018		X					X				X			X											
DU6-SU7	-112.60655	40.98700	5/20/2018		X					X				X			X											
DU6-SU7	-112.60655	40.98251	5/20/2018			X			X								X	X										
DU6-SU7	-112.60062	41.01395	5/20/2018			X			X								X	X										
DU6-SU7	-112.60062	41.00946	5/20/2018			X			X								X	X										
DU6-SU7	-112.60062	41.00497	5/20/2018			X			X								X	X										
DU6-SU7	-112.60062	41.00048	5/20/2018			X			X								X											
DU6-SU7	-112.60062	40.99599	5/20/2018			X			X								X											
DU6-SU7	-112.60062	40.99150	5/20/2018			X			X								X											
DU6-SU7	-112.60062	40.98700	5/20/2018			X			X								X	X										
DU6-SU7	-112.60062	40.98251	5/20/2018		X					X				X			X											

Sample ID	Longitude	Latitude	Date	V	SV	NV	TC	MC	SC	NC	ETC	EMC	ESC	VF	COL	COM	COS	SA	B	SND	BM	EBM	BH	HAL	GYP	HEX	CIR	MR
DU6-SU8	-112.59468	41.01395	5/16/2018			X			X								X	X										
DU6-SU8	-112.59468	41.00946	5/16/2018			X			X									X										
DU6-SU8	-112.59468	41.00497	5/16/2018			X			X									X	X									
DU6-SU8	-112.59468	41.00048	5/16/2018			X			X									X	X									
DU6-SU8	-112.59468	40.99599	5/16/2018			X			X								X	X										
DU6-SU8	-112.59468	40.99150	5/16/2018		X					X							X											
DU6-SU8	-112.59468	40.98700	5/16/2018			X			X								X	X										
DU6-SU8	-112.59468	40.98251	5/16/2018		X					X				X			X											
DU6-SU8	-112.58875	40.99599	5/16/2018		X					X				X			X											
DU6-SU8	-112.58875	40.99150	5/16/2018			X			X								X											
DU6-SU8	-112.58875	40.98700	5/16/2018			X			X								X	X										
DU6-SU8	-112.58875	40.98251	5/16/2018		X					X				X														
DU6-SU8	-112.58282	40.99150	5/16/2018			X			X									X										
DU6-SU8	-112.58282	40.98700	5/16/2018			X			X									X										
DU6-SU8	-112.58282	40.98251	5/16/2018		X					X				X			X											
DU6-SU8	-112.57689	40.99599	5/16/2018			X			X								X	X										
DU6-SU8	-112.57689	40.99150	5/16/2018			X			X									X										
DU6-SU8	-112.57689	40.98700	5/16/2018			X			X								X	X										
DU6-SU8	-112.57689	40.98251	5/16/2018			X			X								X	X										
DU6-SU8	-112.57096	40.99150	5/16/2018			X			X								X	X										
DU6-SU8	-112.57096	40.98700	5/16/2018			X			X								X	X										
DU6-SU8	-112.57096	40.98251	5/16/2018			X			X								X											
DU6-SU8	-112.56503	40.99150	5/16/2018			X			X							X												
DU6-SU8	-112.56503	40.98700	5/16/2018			X			X								X											
DU6-SU8	-112.56503	40.98251	5/16/2018			X			X								X											
DU6-SU8	-112.55910	40.99599	5/16/2018			X			X																			
DU6-SU8	-112.55910	40.99150	5/16/2018			X			X								X											
DU6-SU8	-112.55910	40.98700	5/16/2018			X			X								X											
DU6-SU8	-112.55910	40.98251	5/16/2018			X				X						X	X											
DU6-SU8	-112.55317	41.01395	5/16/2018			X			X							X	X											
DU6-SU8	-112.55317	41.00048	5/16/2018			X			X																			
DU6-SU8	-112.55317	40.99599	5/16/2018		X				X							X												
DU6-SU8	-112.55317	40.99150	5/16/2018			X				X					X	X												
DU6-SU8	-112.55317	40.98700	5/16/2018			X				X						X	X											
DU6-SU8	-112.55317	40.98251	5/16/2018			X			X								X											
DU6-SU8	-112.54724	41.00048	5/16/2018			X			X							X	X											
DU6-SU8	-112.54724	40.98251	5/16/2018		X					X							X											
DU6-SU8	-112.54131	41.00048	5/16/2018		X					X				X	X													
DU6-SU8	-112.53538	41.00048	5/16/2018		X		X								X													

Sample ID	Longitude	Latitude	Date	V	SV	NV	TC	MC	SC	NC	ETC	EMC	ESC	VF	COL	COM	COS	SA	B	SND	BM	EBM	BH	HAL	GYP	HEX	CIR	MR
DU6-SU9	-112.64213	41.04988	6/7/2018			X			X							X	X	X										
DU6-SU9	-112.64213	41.04539	6/7/2018			X			X						X	X	X											
DU6-SU9	-112.64213	41.04090	6/7/2018			X			X							X	X											
DU6-SU9	-112.64213	41.03641	6/7/2018			X			X							X	X											
DU6-SU9	-112.64213	41.03192	6/7/2018			X			X						X	X	X											
DU6-SU9	-112.64213	41.02743	6/7/2018			X			X					X		X	X											
DU6-SU9	-112.64213	41.02293	6/7/2018			X			X					X		X	X											
DU6-SU9	-112.64213	41.01844	6/7/2018			X			X							X	X											
DU6-SU9	-112.63620	41.04988	6/7/2018			X			X							X	X											
DU6-SU9	-112.63620	41.04539	6/7/2018			X			X								X	X										
DU6-SU9	-112.63620	41.04090	6/7/2018			X			X							X	X	X										
DU6-SU9	-112.63620	41.03641	6/7/2018			X			X							X	X	X										
DU6-SU9	-112.63620	41.03192	6/7/2018			X			X							X	X											
DU6-SU9	-112.63620	41.02743	6/7/2018		X					X				X		X	X											
DU6-SU9	-112.63620	41.02293	6/7/2018		X					X				X		X	X											
DU6-SU9	-112.63620	41.01844	6/7/2018		X					X				X		X	X											
DU6-SU9	-112.63027	41.04988	6/7/2018			X			X								X		X									
DU6-SU9	-112.63027	41.04539	6/7/2018			X			X								X											
DU6-SU9	-112.63027	41.04090	6/7/2018			X			X								X											
DU6-SU9	-112.63027	41.03641	6/7/2018			X			X								X	X										
DU6-SU9	-112.63027	41.03192	6/7/2018			X			X								X	X										
DU6-SU9	-112.63027	41.02743	6/7/2018			X			X							X	X											
DU6-SU9	-112.63027	41.02293	6/7/2018			X			X								X											
DU6-SU9	-112.63027	41.01844	6/7/2018		X				X								X											
DU6-SU9	-112.62434	41.04988	6/7/2018			X			X					X			X											
DU6-SU9	-112.62434	41.04539	6/7/2018			X			X								X	X										
DU6-SU9	-112.62434	41.04090	6/7/2018			X			X															X				
DU6-SU9	-112.62434	41.03641	6/7/2018			X			X								X											
DU6-SU9	-112.62434	41.03192	6/7/2018			X			X								X	X										
DU6-SU9	-112.62434	41.02743	6/7/2018		X					X				X			X											
DU6-SU9	-112.62434	41.02293	6/7/2018			X			X								X											
DU6-SU9	-112.62434	41.01844	6/7/2018		X					X				X		X	X											
DU6-SU9	-112.61841	41.03641	6/7/2018			X			X															X				
DU6-SU9	-112.61841	41.02743	6/7/2018			X			X								X											
DU6-SU9	-112.61841	41.02293	6/7/2018			X			X								X	X	X									
DU6-SU9	-112.61841	41.01844	6/7/2018		X					X				X		X	X											
DU6-SU9	-112.61248	41.03192	6/7/2018			X			X								X											
DU6-SU9	-112.61248	41.02743	6/7/2018			X			X								X											
DU6-SU9	-112.61248	41.02293	6/7/2018			X			X								X	X	X									
DU6-SU9	-112.61248	41.01844	6/7/2018			X			X								X	X	X									
DU6-SU9	-112.60655	41.02743	6/7/2018			X			X								X											
DU6-SU9	-112.60655	41.02293	6/7/2018			X			X								X	X										
DU6-SU9	-112.60655	41.01844	6/7/2018			X			X								X											
DU6-SU9	-112.60062	41.04988	6/7/2018			X			X								X	X										
DU6-SU9	-112.60062	41.04539	6/7/2018			X			X								X	X										
DU6-SU9	-112.60062	41.04090	6/7/2018			X			X								X	X										
DU6-SU9	-112.60062	41.03641	6/7/2018			X			X								X											
DU6-SU9	-112.60062	41.03192	6/7/2018			X			X								X	X										
DU6-SU9	-112.60062	41.02743	6/7/2018			X			X								X											
DU6-SU9	-112.60062	41.02293	6/7/2018			X			X								X	X										
DU6-SU9	-112.60062	41.01844	6/7/2018			X			X								X	X										

Sample ID	Longitude	Latitude	Date	V	SV	NV	TC	MC	SC	NC	ETC	EMC	ESC	VF	COL	COM	COS	SA	B	SND	BM	EBM	BH	HAL	GYP	HEX	CIR	MR
DU6-SU10	-112.59468	41.04988	5/16/2018			X			X								X	X										
DU6-SU10	-112.59468	41.04539	5/16/2018			X			X								X	X										
DU6-SU10	-112.59468	41.04090	5/16/2018			X			X								X	X										
DU6-SU10	-112.59468	41.03641	5/16/2018			X				X							X											
DU6-SU10	-112.59468	41.03192	5/16/2018			X			X								X	X										
DU6-SU10	-112.59468	41.02743	5/16/2018			X			X								X	X										
DU6-SU10	-112.59468	41.02293	5/16/2018			X			X								X	X										
DU6-SU10	-112.59468	41.01844	5/16/2018			X				X							X											
DU6-SU10	-112.58875	41.04988	5/16/2018			X			X								X	X										
DU6-SU10	-112.58875	41.04539	5/16/2018			X			X								X	X										
DU6-SU10	-112.58875	41.04090	5/16/2018			X			X								X											
DU6-SU10	-112.58875	41.03641	5/16/2018			X				X							X											
DU6-SU10	-112.58875	41.03192	5/16/2018			X			X								X											
DU6-SU10	-112.58875	41.02743	5/16/2018			X			X								X	X										
DU6-SU10	-112.58875	41.02293	5/16/2018			X			X								X	X										
DU6-SU10	-112.58875	41.01844	5/16/2018			X			X								X	X										
DU6-SU10	-112.58282	41.04988	5/16/2018			X				X							X											
DU6-SU10	-112.58282	41.04539	5/16/2018			X			X								X											
DU6-SU10	-112.58282	41.04090	5/16/2018			X			X								X	X										
DU6-SU10	-112.58282	41.03641	5/16/2018			X			X								X	X										
DU6-SU10	-112.58282	41.03192	5/16/2018			X			X								X											
DU6-SU10	-112.58282	41.02743	5/16/2018			X				X							X											
DU6-SU10	-112.58282	41.02293	5/16/2018			X				X							X											
DU6-SU10	-112.57689	41.04988	5/16/2018			X			X								X	X										
DU6-SU10	-112.57689	41.04539	5/16/2018			X				X							X											
DU6-SU10	-112.57689	41.04090	5/16/2018			X			X								X	X										
DU6-SU10	-112.57689	41.03192	5/16/2018			X			X								X											
DU6-SU10	-112.57689	41.02743	5/16/2018			X				X							X											
DU6-SU10	-112.57689	41.02293	5/16/2018			X				X							X											
DU6-SU10	-112.57096	41.03192	5/16/2018			X				X							X											
DU6-SU10	-112.57096	41.02743	5/16/2018			X				X							X											
DU6-SU10	-112.57096	41.02293	5/16/2018		X					X				X			X											
DU6-SU10	-112.55909	41.02293	5/16/2018			X			X								X											
DU6-SU10	-112.55316	41.01844	5/16/2018		X					X						X	X											

Sample ID	Longitude	Latitude	Date	V	SV	NV	TC	MC	SC	NC	ETC	EMC	ESC	VF	COL	COM	COS	SA	B	SND	BM	EBM	BH	HAL	GYP	HEX	CIR	MR
DU6-SU11	-112.64213	41.05887	6/2/2018			X			X							X	X	X										
DU6-SU11	-112.64213	41.05438	6/2/2018			X			X							X	X	X										
DU6-SU11	-112.63620	41.07234	6/2/2018			X			X								X	X										
DU6-SU11	-112.63620	41.06785	6/2/2018			X			X								X	X										
DU6-SU11	-112.63620	41.06336	6/2/2018			X			X								X											
DU6-SU11	-112.63620	41.05887	6/2/2018			X			X							X	X	X										
DU6-SU11	-112.63620	41.05438	6/2/2018			X			X								X	X										
DU6-SU11	-112.63027	41.07234	6/2/2018			X			X								X	X										
DU6-SU11	-112.63027	41.06785	6/2/2018			X			X								X	X										
DU6-SU11	-112.63027	41.06336	6/2/2018			X			X							X	X											
DU6-SU11	-112.63027	41.05887	6/2/2018			X			X								X	X										
DU6-SU11	-112.63027	41.05438	6/2/2018			X			X								X	X	X									
DU6-SU11	-112.62434	41.07683	6/2/2018			X			X								X	X					X					
DU6-SU11	-112.62434	41.07234	6/2/2018			X			X								X							X				
DU6-SU11	-112.62434	41.06785	6/2/2018			X			X								X	X										
DU6-SU11	-112.62434	41.06336	6/2/2018			X			X								X	X										
DU6-SU11	-112.62434	41.05887	6/2/2018			X			X								X	X										
DU6-SU11	-112.62434	41.05438	6/2/2018			X			X								X											
DU6-SU11	-112.61841	41.07234	6/2/2018			X			X								X	X					X					
DU6-SU11	-112.61841	41.06785	6/2/2018			X			X								X	X										
DU6-SU11	-112.61841	41.06336	6/2/2018			X			X										X					X				
DU6-SU11	-112.61841	41.05887	6/2/2018			X			X								X	X										
DU6-SU11	-112.61841	41.05438	6/2/2018			X			X								X	X										
DU6-SU11	-112.61248	41.07234	6/2/2018			X			X								X	X					X					
DU6-SU11	-112.61248	41.06785	6/2/2018			X			X								X	X										
DU6-SU11	-112.61248	41.06336	6/2/2018			X			X															X				
DU6-SU11	-112.61248	41.05887	6/2/2018			X			X								X	X										
DU6-SU11	-112.61248	41.05438	6/2/2018			X			X								X	X										
DU6-SU11	-112.60655	41.07234	6/2/2018			X			X								X	X					X					
DU6-SU11	-112.60655	41.06785	6/2/2018			X			X								X	X										
DU6-SU11	-112.60655	41.06336	6/2/2018			X			X								X	X										
DU6-SU11	-112.60655	41.05887	6/2/2018			X			X								X	X										
DU6-SU11	-112.60655	41.05438	6/2/2018			X			X								X							X				
DU6-SU11	-112.60062	41.07683	6/2/2018			X			X								X	X					X					
DU6-SU11	-112.60062	41.07234	6/2/2018			X			X								X	X										
DU6-SU11	-112.60062	41.06785	6/2/2018			X			X								X	X										
DU6-SU11	-112.60062	41.06336	6/2/2018			X			X								X	X										
DU6-SU11	-112.60062	41.05887	6/2/2018			X			X								X											
DU6-SU11	-112.60062	41.05438	6/2/2018			X			X								X	X										
DU6-SU11	-112.59469	41.07683	6/2/2018			X				X							X	X										
DU6-SU11	-112.59469	41.07234	6/2/2018			X			X								X	X										
DU6-SU11	-112.59469	41.06785	6/2/2018			X			X								X	X										
DU6-SU11	-112.59469	41.06336	6/2/2018			X			X								X	X										
DU6-SU11	-112.59469	41.05887	6/2/2018			X			X								X											
DU6-SU11	-112.59469	41.05438	6/2/2018			X			X								X											
DU6-SU11	-112.58876	41.07683	6/2/2018			X			X								X	X										
DU6-SU11	-112.58876	41.07234	6/2/2018			X			X								X											
DU6-SU11	-112.58876	41.06785	6/2/2018			X			X								X	X										
DU6-SU11	-112.58876	41.06336	6/2/2018			X			X								X	X										
DU6-SU11	-112.58876	41.05887	6/2/2018			X			X							X												
DU6-SU11	-112.58876	41.05438	6/2/2018			X		X									X											
DU6-SU11	-112.58283	41.07683	6/2/2018			X				X							X	X										
DU6-SU11	-112.58283	41.07234	6/2/2018			X			X								X	X										
DU6-SU11	-112.58283	41.06785	6/2018		X					X				X		X	X											
DU6-SU11	-112.58283	41.06336	6/2018		X					X				X			X											
DU6-SU11	-112.58283	41.05887	6/2018			X			X								X	X										
DU6-SU11	-112.58283	41.05438	6/2018			X			X								X	X										
DU6-SU11	-112.57690	41.05887	6/2018			X			X								X											
DU6-SU11	-112.57690	41.05438	6/2018			X			X								X											

Sample ID	Longitude	Latitude	Date	V	SV	NV	TC	MC	SC	NC	ETC	EMC	ESC	VF	COL	COM	COS	SA	B	SND	BM	EBM	BH	HAL	GYP	HEX	CIR	MR
DU7-SU1	-112.73704	40.94658	2/6/2018		X					X							X											
DU7-SU1	-112.73111	40.94658	2/6/2018			X			X								X											
DU7-SU1	-112.73111	40.94209	2/6/2018			X				X							X											
DU7-SU1	-112.72518	40.94658	2/6/2018			X		X									X											
DU7-SU1	-112.72518	40.94209	2/6/2018			X			X								X											
DU7-SU1	-112.72518	40.93760	2/6/2018			X			X																			
DU7-SU1	-112.71925	40.94658	2/6/2018		X					X				X			X											
DU7-SU1	-112.71925	40.94209	2/6/2018		X				X					X														
DU7-SU1	-112.71925	40.93760	2/6/2018			X		X									X											
DU7-SU1	-112.71332	40.94658	2/6/2018		X					X				X														
DU7-SU1	-112.71332	40.94209	2/6/2018		X							X		X														
DU7-SU1	-112.71332	40.93760	2/6/2018			X			X									X										
DU7-SU1	-112.70739	40.94658	2/6/2018			X			X																			
DU7-SU1	-112.70739	40.94209	2/6/2018			X			X					X			X											
DU7-SU1	-112.70739	40.93760	2/6/2018			X			X																			
DU7-SU1	-112.70146	40.94658	2/6/2018			X			X										X									
DU7-SU1	-112.70146	40.94209	2/6/2018		X					X				X			X											
DU7-SU1	-112.70146	40.93760	2/6/2018		X							X					X	X										
DU7-SU1	-112.70146	40.93311	2/6/2018		X				X								X	X										
DU7-SU1	-112.70146	40.92862	2/6/2018			X			X					X			X											
DU7-SU1	-112.70146	40.92413	2/6/2018			X			X					X			X											
DU7-SU1	-112.69553	40.94658	2/6/2018			X				X				X														

Sample ID	Longitude	Latitude	Date	V	SV	NV	TC	MC	SC	NC	ETC	EMC	ESC	VF	COL	COM	COS	SA	B	SND	BM	EBM	BH	HAL	GYP	HEX	CIR	MR
DU7-SU2	-112.73704	40.99150	2/8/2018			X				X				X			X											
DU7-SU2	-112.73704	40.98701	2/8/2018			X			X								X											
DU7-SU2	-112.73704	40.98252	2/8/2018			X			X								X											
DU7-SU2	-112.73704	40.97803	2/8/2018		X					X				X			X											
DU7-SU2	-112.73704	40.97354	2/8/2018			X			X								X											
DU7-SU2	-112.73704	40.96905	2/8/2018			X			X							X	X											
DU7-SU2	-112.73704	40.96455	2/8/2018			X		X									X											
DU7-SU2	-112.73704	40.96006	2/8/2018			X			X							X	X											
DU7-SU2	-112.73704	40.95557	2/8/2018			X			X								X											
DU7-SU2	-112.73704	40.95108	2/8/2018			X			X								X	X						X				
DU7-SU2	-112.73111	40.98252	2/8/2018			X			X								X											
DU7-SU2	-112.73111	40.97803	2/8/2018			X				X							X											
DU7-SU2	-112.73111	40.97354	2/8/2018			X				X							X											
DU7-SU2	-112.73111	40.96905	2/8/2018			X				X						X	X											
DU7-SU2	-112.73111	40.96455	2/8/2018			X			X								X											
DU7-SU2	-112.73111	40.96006	2/8/2018			X			X								X											
DU7-SU2	-112.73111	40.95557	2/8/2018			X			X								X											
DU7-SU2	-112.73111	40.95108	2/8/2018			X			X									X						X				
DU7-SU2	-112.72518	40.97803	2/8/2018			X				X				X			X											
DU7-SU2	-112.72518	40.97354	2/8/2018			X				X						X	X											
DU7-SU2	-112.72518	40.96905	2/8/2018			X			X								X											
DU7-SU2	-112.72518	40.96455	2/8/2018			X			X								X											
DU7-SU2	-112.72518	40.96006	2/8/2018			X			X							X	X	X										
DU7-SU2	-112.72518	40.95557	2/8/2018			X			X								X											
DU7-SU2	-112.72518	40.95108	2/8/2018			X			X									X						X				
DU7-SU2	-112.71925	40.97803	2/8/2018			X				X																		
DU7-SU2	-112.71925	40.97354	2/8/2018			X			X								X											
DU7-SU2	-112.71925	40.96905	2/8/2018			X			X								X											
DU7-SU2	-112.71925	40.96455	2/8/2018			X			X																			
DU7-SU2	-112.71925	40.96006	2/8/2018			X			X								X											
DU7-SU2	-112.71925	40.95557	2/8/2018			X			X																			
DU7-SU2	-112.71925	40.95108	2/8/2018			X			X								X											
DU7-SU2	-112.71332	40.97354	2/8/2018			X				X						X												
DU7-SU2	-112.71332	40.96905	2/8/2018			X				X						X												
DU7-SU2	-112.71332	40.96455	2/8/2018			X				X						X												
DU7-SU2	-112.71332	40.96006	2/8/2018			X			X									X	X									
DU7-SU2	-112.71332	40.95557	2/8/2018			X			X									X										
DU7-SU2	-112.71332	40.95108	2/8/2018		X					X				X			X											
DU7-SU2	-112.70739	40.96455	2/8/2018			X			X																			X
DU7-SU2	-112.70739	40.96006	2/8/2018			X			X								X											
DU7-SU2	-112.70739	40.95557	2/8/2018			X			X								X											
DU7-SU2	-112.70739	40.95108	2/8/2018		X					X				X			X											
DU7-SU2	-112.70146	40.96006	2/8/2018		X					X				X			X											
DU7-SU2	-112.70146	40.95557	2/8/2018			X				X							X											
DU7-SU2	-112.70146	40.95108	2/8/2018			X			X								X											
DU7-SU2	-112.69553	40.96006	2/8/2018			X				X								X	X									
DU7-SU2	-112.69553	40.95557	2/8/2018			X				X				X			X											
DU7-SU2	-112.69553	40.95108	2/8/2018			X			X																			

Sample ID	Longitude	Latitude	Date	V	SV	NV	TC	MC	SC	NC	ETC	EMC	ESC	VF	COL	COM	COS	SA	B	SND	BM	EBM	BH	HAL	GYP	HEX	CIR	MR
DU7-SU3	-112.78449	41.01395	2/9/2018			X			X																			
DU7-SU3	-112.78449	41.00946	2/9/2018			X			X									X										
DU7-SU3	-112.78449	41.00497	2/9/2018			X			X									X										
DU7-SU3	-112.78449	41.00048	2/9/2018			X			X									X										
DU7-SU3	-112.78449	40.99599	2/9/2018			X			X								X											
DU7-SU3	-112.78449	40.99150	2/9/2018			X			X									X										
DU7-SU3	-112.78449	40.98700	2/9/2018			X			X																		X	
DU7-SU3	-112.78449	40.98251	2/9/2018			X			X																			
DU7-SU3	-112.78449	40.97802	2/9/2018			X			X									X										
DU7-SU3	-112.78449	40.97353	2/9/2018			X			X									X										
DU7-SU3	-112.78449	40.96904	2/9/2018			X			X									X										
DU7-SU3	-112.78449	40.96455	2/9/2018		X					X																		
DU7-SU3	-112.77856	41.01395	2/9/2018			X			X																			
DU7-SU3	-112.77856	41.00946	2/9/2018			X			X									X										
DU7-SU3	-112.77856	41.00497	2/9/2018			X			X																			
DU7-SU3	-112.77856	41.00048	2/9/2018			X							X															
DU7-SU3	-112.77856	40.99599	2/9/2018			X							X			X		X										
DU7-SU3	-112.77856	40.99150	2/9/2018			X				X																		
DU7-SU3	-112.77856	40.98700	2/9/2018			X			X								X											
DU7-SU3	-112.77856	40.98251	2/9/2018			X			X								X											
DU7-SU3	-112.77856	40.97802	2/9/2018			X							X															
DU7-SU3	-112.77856	40.97353	2/9/2018			X						X															X	
DU7-SU3	-112.77856	40.96904	2/9/2018			X			X								X	X										
DU7-SU3	-112.77856	40.96455	2/9/2018			X			X									X										
DU7-SU3	-112.77263	41.01395	2/9/2018		X				X					X			X											
DU7-SU3	-112.77263	41.00946	2/9/2018			X							X					X										
DU7-SU3	-112.77263	41.00497	2/9/2018			X							X			X												
DU7-SU3	-112.77263	41.00048	2/9/2018		X				X								X	X										
DU7-SU3	-112.77263	40.99599	2/9/2018			X				X																		
DU7-SU3	-112.77263	40.99150	2/9/2018			X			X								X											
DU7-SU3	-112.77263	40.98700	2/9/2018			X			X								X											
DU7-SU3	-112.77263	40.98251	2/9/2018		X					X				X			X											
DU7-SU3	-112.77263	40.97802	2/9/2018			X			X									X										
DU7-SU3	-112.77263	40.97353	2/9/2018			X			X							X	X	X										
DU7-SU3	-112.77263	40.96904	2/9/2018			X			X								X	X										
DU7-SU3	-112.77263	40.96455	2/9/2018			X			X									X	X									
DU7-SU3	-112.76670	41.01395	2/9/2018			X				X						X	X	X										
DU7-SU3	-112.76670	41.00946	2/9/2018			X							X					X										
DU7-SU3	-112.76670	41.00497	2/9/2018			X							X			X		X										
DU7-SU3	-112.76670	41.00048	2/9/2018			X			X									X										
DU7-SU3	-112.76670	40.99599	2/9/2018		X					X						X	X											
DU7-SU3	-112.76670	40.99150	2/9/2018			X				X						X	X											
DU7-SU3	-112.76670	40.98700	2/9/2018			X				X						X	X											
DU7-SU3	-112.76670	40.98251	2/9/2018		X					X				X			X											
DU7-SU3	-112.76670	40.97802	2/9/2018			X			X							X	X	X										
DU7-SU3	-112.76670	40.97353	2/9/2018			X			X							X	X	X										
DU7-SU3	-112.76670	40.96904	2/9/2018			X			X								X											
DU7-SU3	-112.76670	40.96455	2/9/2018			X			X									X										
DU7-SU3	-112.76670	40.96006	2/9/2018		X			X						X														
DU7-SU3	-112.76077	41.01395	2/9/2018			X			X								X	X										
DU7-SU3	-112.76077	41.00946	2/9/2018			X							X				X	X										

Sample ID	Longitude	Latitude	Date	V	SV	NV	TC	MC	SC	NC	ETC	EMC	ESC	VF	COL	COM	COS	SA	B	SND	BM	EBM	BH	HAL	GYP	HEX	CIR	MR
DU7-SU3	-112.76077	41.00497	2/9/2018			X			X									X										
DU7-SU3	-112.76077	41.00048	2/9/2018			X			X									X	X									
DU7-SU3	-112.76077	40.99599	2/9/2018			X			X									X										
DU7-SU3	-112.76077	40.99150	2/9/2018			X			X								X											
DU7-SU3	-112.76077	40.98700	2/9/2018			X				X							X	X										
DU7-SU3	-112.76077	40.98251	2/9/2018			X				X							X											
DU7-SU3	-112.76077	40.97802	2/9/2018			X			X							X	X	X										
DU7-SU3	-112.76077	40.97353	2/9/2018			X			X								X	X										
DU7-SU3	-112.76077	40.96904	2/9/2018			X			X							X	X											
DU7-SU3	-112.76077	40.96455	2/9/2018			X			X									X										
DU7-SU3	-112.76077	40.96006	2/9/2018			X			X									X										
DU7-SU3	-112.75484	41.00946	2/9/2018		X					X				X														
DU7-SU3	-112.75484	41.00497	2/9/2018			X			X									X										
DU7-SU3	-112.75484	41.00048	2/9/2018			X			X									X	X									
DU7-SU3	-112.75484	40.99599	2/9/2018			X			X							X												
DU7-SU3	-112.75484	40.99150	2/9/2018			X				X						X												
DU7-SU3	-112.75484	40.98700	2/9/2018			X				X						X	X	X										
DU7-SU3	-112.75484	40.98251	2/9/2018			X			X								X	X										
DU7-SU3	-112.75484	40.97802	2/9/2018			X				X							X	X										
DU7-SU3	-112.75484	40.97353	2/9/2018			X			X								X	X										
DU7-SU3	-112.75484	40.96904	2/9/2018			X			X										X									
DU7-SU3	-112.75484	40.96455	2/9/2018			X			X							X												
DU7-SU3	-112.75484	40.96006	2/9/2018			X			X									X	X									
DU7-SU3	-112.74891	41.00946	2/9/2018			X				X				X			X											
DU7-SU3	-112.74891	41.00497	2/9/2018			X			X					X				X										
DU7-SU3	-112.74891	41.00048	2/9/2018			X			X									X	X									
DU7-SU3	-112.74891	40.99599	2/9/2018			X			X									X	X									
DU7-SU3	-112.74891	40.99150	2/9/2018			X			X								X	X										
DU7-SU3	-112.74891	40.98700	2/9/2018			X			X								X		X									
DU7-SU3	-112.74891	40.98251	2/9/2018			X			X								X											
DU7-SU3	-112.74891	40.97802	2/9/2018			X			X																			
DU7-SU3	-112.74891	40.97353	2/9/2018			X			X								X	X										
DU7-SU3	-112.74891	40.96904	2/9/2018			X			X								X		X									
DU7-SU3	-112.74891	40.96455	2/9/2018			X			X										X									
DU7-SU3	-112.74891	40.96006	2/9/2018			X			X							X												
DU7-SU3	-112.74891	40.95557	2/9/2018		X								X					X										
DU7-SU3	-112.74298	41.00946	2/9/2018		X					X							X											
DU7-SU3	-112.74298	41.00497	2/9/2018		X					X							X											
DU7-SU3	-112.74298	41.00048	2/9/2018			X			X								X	X										
DU7-SU3	-112.74298	40.99599	2/9/2018			X			X								X											
DU7-SU3	-112.74298	40.99150	2/9/2018			X			X								X											
DU7-SU3	-112.74298	40.98700	2/9/2018			X			X								X											
DU7-SU3	-112.74298	40.98251	2/9/2018			X				X						X	X											
DU7-SU3	-112.74298	40.97802	2/9/2018			X			X								X											
DU7-SU3	-112.74298	40.97353	2/9/2018			X			X								X											
DU7-SU3	-112.74298	40.96904	2/9/2018			X			X							X	X											
DU7-SU3	-112.74298	40.96455	2/9/2018			X			X										X									
DU7-SU3	-112.74298	40.96006	2/9/2018			X			X							X	X											
DU7-SU3	-112.74298	40.95557	2/9/2018			X					X													X				
DU7-SU3	-112.74298	40.95108	2/9/2018		X					X																		
DU7-SU3	-112.73705	41.00497	2/9/2018		X					X				X			X											
DU7-SU3	-112.73112	41.00497	2/9/2018			X				X				X			X											
DU7-SU3	-112.72519	41.00497	2/9/2018			X				X				X			X											

Sample ID	Longitude	Latitude	Date	V	SV	NV	TC	MC	SC	NC	ETC	EMC	ESC	VF	COL	COM	COS	SA	B	SND	BM	EBM	BH	HAL	GYP	HEX	CIR	MR
DU7-SU4	-112.78449	41.02743	2/17/2018			X			X									X										
DU7-SU4	-112.78449	41.02294	2/17/2018		X					X							X											
DU7-SU4	-112.78449	41.01845	2/17/2018			X							X					X										
DU7-SU4	-112.77856	41.02743	2/17/2018			X			X									X										
DU7-SU4	-112.77856	41.02294	2/17/2018		X					X							X											
DU7-SU4	-112.77856	41.01845	2/17/2018		X								X			X	X											
DU7-SU4	-112.77263	41.02743	2/17/2018			X			X								X	X										
DU7-SU4	-112.77263	41.02294	2/17/2018			X							X				X	X										
DU7-SU4	-112.77263	41.01845	2/17/2018			X			X								X	X										
DU7-SU4	-112.76670	41.02743	2/17/2018			X			X								X	X										
DU7-SU4	-112.76670	41.02294	2/17/2018			X						X					X		X					X				
DU7-SU4	-112.76670	41.01845	2/17/2018		X					X							X											
DU7-SU4	-112.76077	41.01845	2/17/2018			X			X							X	X											

Sample ID	Longitude	Latitude	Date	V	SV	NV	TC	MC	SC	NC	ETC	EMC	ESC	VF	COL	COM	COS	SA	B	SND	BM	EBM	BH	HAL	GYP	HEX	CIR	MR
DU7-SU5	-112.83194	41.01395	4/1/2018			X			X									X										
DU7-SU5	-112.83194	41.00946	4/1/2018			X			X									X										
DU7-SU5	-112.83194	41.00497	4/1/2018			X			X									X										
DU7-SU5	-112.83194	41.00048	4/1/2018			X			X									X										
DU7-SU5	-112.83194	40.99599	4/1/2018		X						X			X				X										
DU7-SU5	-112.83194	40.99150	4/1/2018			X			X									X										
DU7-SU5	-112.82601	41.01395	4/1/2018			X							X	X				X										
DU7-SU5	-112.82601	41.00946	4/1/2018			X		X										X										
DU7-SU5	-112.82601	41.00497	4/1/2018			X			X									X										
DU7-SU5	-112.82601	41.00048	4/1/2018			X			X									X										
DU7-SU5	-112.82601	40.99599	4/1/2018			X			X									X										
DU7-SU5	-112.82601	40.99150	4/1/2018			X			X					X				X										
DU7-SU5	-112.82601	40.98700	4/1/2018			X			X									X										
DU7-SU5	-112.82601	40.98251	4/1/2018			X			X									X										
DU7-SU5	-112.82008	41.01395	4/1/2018			X			X									X										
DU7-SU5	-112.82008	41.00946	4/1/2018			X						X		X				X										
DU7-SU5	-112.82008	41.00497	4/1/2018			X			X									X										
DU7-SU5	-112.82008	41.00048	4/1/2018			X			X									X										
DU7-SU5	-112.82008	40.99599	4/1/2018			X			X									X										
DU7-SU5	-112.82008	40.99150	4/1/2018			X			X									X										
DU7-SU5	-112.82008	40.98700	4/1/2018			X			X									X										
DU7-SU5	-112.82008	40.98251	4/1/2018			X			X									X										
DU7-SU5	-112.82008	40.97802	4/1/2018		X					X				X														
DU7-SU5	-112.81415	41.01395	4/1/2018			X						X						X										
DU7-SU5	-112.81415	41.00946	4/1/2018			X							X	X				X										
DU7-SU5	-112.81415	41.00497	4/1/2018			X		X										X										
DU7-SU5	-112.81415	41.00048	4/1/2018			X		X										X										
DU7-SU5	-112.81415	40.99599	4/1/2018			X			X					X				X										
DU7-SU5	-112.81415	40.99150	4/1/2018			X			X									X										
DU7-SU5	-112.81415	40.98700	4/1/2018			X		X										X										
DU7-SU5	-112.81415	40.98251	4/1/2018			X			X									X										
DU7-SU5	-112.81415	40.97802	4/1/2018			X			X									X										
DU7-SU5	-112.80822	41.01395	4/1/2018			X			X									X										
DU7-SU5	-112.80822	41.00946	4/1/2018			X			X									X										
DU7-SU5	-112.80822	41.00497	4/1/2018			X			X									X										
DU7-SU5	-112.80822	41.00048	4/1/2018			X			X					X				X										
DU7-SU5	-112.80822	40.99599	4/1/2018			X			X									X										
DU7-SU5	-112.80822	40.99150	4/1/2018			X			X									X										
DU7-SU5	-112.80822	40.98700	4/1/2018			X			X									X										
DU7-SU5	-112.80822	40.98251	4/1/2018			X			X									X										
DU7-SU5	-112.80822	40.97802	4/1/2018			X			X									X									X	
DU7-SU5	-112.80822	40.97353	4/1/2018		X				X									X										
DU7-SU5	-112.80229	41.01395	4/1/2018			X		X										X										
DU7-SU5	-112.80229	41.00946	4/1/2018			X			X									X										
DU7-SU5	-112.80229	41.00497	4/1/2018			X			X									X										
DU7-SU5	-112.80229	41.00048	4/1/2018			X			X									X										
DU7-SU5	-112.80229	40.99599	4/1/2018			X		X										X										
DU7-SU5	-112.80229	40.99150	4/1/2018			X			X									X										
DU7-SU5	-112.80229	40.98700	4/1/2018			X			X									X										
DU7-SU5	-112.80229	40.98251	4/1/2018			X			X									X										

Sample ID	Longitude	Latitude	Date	V	SV	NV	TC	MC	SC	NC	ETC	EMC	ESC	VF	COL	COM	COS	SA	B	SND	BM	EBM	BH	HAL	GYP	HEX	CIR	MR
DU7-SU5	-112.80229	40.97802	4/1/2018			X			X									X										
DU7-SU5	-112.80229	40.97353	4/1/2018			X			X									X										
DU7-SU5	-112.79636	41.01395	4/1/2018			X			X									X										
DU7-SU5	-112.79636	41.00946	4/1/2018			X			X									X										
DU7-SU5	-112.79636	41.00497	4/1/2018			X			X									X										
DU7-SU5	-112.79636	41.00048	4/1/2018			X			X									X										
DU7-SU5	-112.79636	40.99599	4/1/2018			X			X									X										
DU7-SU5	-112.79636	40.99150	4/1/2018			X			X					X				X										
DU7-SU5	-112.79636	40.98700	4/1/2018		X					X				X				X										
DU7-SU5	-112.79636	40.98251	4/1/2018			X			X									X										
DU7-SU5	-112.79636	40.97802	4/1/2018			X			X									X										
DU7-SU5	-112.79636	40.97353	4/1/2018			X			X									X										
DU7-SU5	-112.79636	40.96904	4/1/2018		X				X									X										
DU7-SU5	-112.79043	41.01395	4/1/2018			X			X									X										
DU7-SU5	-112.79043	41.00946	4/1/2018			X			X									X										
DU7-SU5	-112.79043	41.00497	4/1/2018			X			X									X										
DU7-SU5	-112.79043	41.00048	4/1/2018			X			X									X										
DU7-SU5	-112.79043	40.99599	4/1/2018			X		X						X				X										
DU7-SU5	-112.79043	40.99150	4/1/2018			X			X									X										
DU7-SU5	-112.79043	40.98700	4/1/2018			X			X									X										
DU7-SU5	-112.79043	40.98251	4/1/2018			X			X									X										
DU7-SU5	-112.79043	40.97802	4/1/2018			X			X									X										
DU7-SU5	-112.79043	40.97353	4/1/2018			X			X									X										
DU7-SU5	-112.79043	40.96904	4/1/2018			X			X									X										
DU7-SU5	-112.79043	40.96455	4/1/2018		X				X									X										

Sample ID	Longitude	Latitude	Date	V	SV	NV	TC	MC	SC	NC	ETC	EMC	ESC	VF	COL	COM	COS	SA	B	SND	BM	EBM	BH	HAL	GYP	HEX	CIR	MR
DU7-SU6	-112.85567	41.02743	2/17/2018			X			X							X	X											
DU7-SU6	-112.84974	41.02743	2/17/2018			X						X						X										
DU7-SU6	-112.84974	41.02294	2/17/2018			X						X																
DU7-SU6	-112.84974	41.01845	2/17/2018			X			X									X										
DU7-SU6	-112.84381	41.02743	2/17/2018			X							X					X										
DU7-SU6	-112.84381	41.02294	2/17/2018			X					X															X		
DU7-SU6	-112.84381	41.01845	2/17/2018			X		X										X										
DU7-SU6	-112.84381	41.01396	2/17/2018			X		X										X										
DU7-SU6	-112.84381	41.00497	2/17/2018			X			X									X										
DU7-SU6	-112.84381	41.00048	2/17/2018			X			X									X										
DU7-SU6	-112.84381	40.99599	2/17/2018			X						X						X								X		
DU7-SU6	-112.83788	41.02743	2/17/2018		X							X		X														
DU7-SU6	-112.83788	41.02294	2/17/2018			X			X									X										
DU7-SU6	-112.83788	41.01845	2/17/2018		X						X															X		
DU7-SU6	-112.83788	41.01396	2/17/2018			X			X									X										
DU7-SU6	-112.83788	41.00947	2/17/2018			X		X										X										
DU7-SU6	-112.83788	41.00498	2/17/2018			X			X									X										
DU7-SU6	-112.83788	41.00048	2/17/2018		X						X							X								X		
DU7-SU6	-112.83788	40.99599	2/17/2018		X					X				X								X						
DU7-SU6	-112.83788	40.99150	2/17/2018		X						X			X			X											

Sample ID	Longitude	Latitude	Date	V	SV	NV	TC	MC	SC	NC	ETC	EMC	ESC	VF	COL	COM	COS	SA	B	SND	BM	EBM	BH	HAL	GYP	HEX	CIR	MR
DU7-SU7	-112.83194	41.02743	2/17/2018			X					X							X										
DU7-SU7	-112.83194	41.02294	2/17/2018			X			X									X										
DU7-SU7	-112.83194	41.01845	2/17/2018			X			X								X	X										
DU7-SU7	-112.82601	41.02743	2/17/2018			X							X					X										
DU7-SU7	-112.82601	41.02294	2/17/2018		X						X															X		
DU7-SU7	-112.82601	41.01845	2/17/2018			X			X									X										
DU7-SU7	-112.82008	41.02743	2/17/2018			X							X					X										
DU7-SU7	-112.82008	41.02294	2/17/2018		X						X															X		
DU7-SU7	-112.82008	41.01845	2/17/2018			X		X																				
DU7-SU7	-112.81415	41.02743	2/17/2018			X							X					X										
DU7-SU7	-112.81415	41.02294	2/17/2018		X						X															X		
DU7-SU7	-112.81415	41.01845	2/17/2018			X			X									X										
DU7-SU7	-112.80822	41.02743	2/17/2018			X							X					X										
DU7-SU7	-112.80822	41.02294	2/17/2018			X			X									X										
DU7-SU7	-112.80822	41.01845	2/17/2018			X			X									X										
DU7-SU7	-112.80229	41.02743	2/17/2018			X							X					X										
DU7-SU7	-112.80229	41.02294	2/17/2018			X			X									X										
DU7-SU7	-112.80229	41.01845	2/17/2018			X			X									X										
DU7-SU7	-112.79636	41.02743	2/17/2018			X			X									X									X	
DU7-SU7	-112.79636	41.02294	2/17/2018			X						X						X									X	
DU7-SU7	-112.79636	41.01845	2/17/2018			X			X									X									X	
DU7-SU7	-112.79043	41.02743	2/17/2018			X			X								X	X										
DU7-SU7	-112.79043	41.02294	2/17/2018		X								X															
DU7-SU7	-112.79043	41.01845	2/17/2018		X							X																

Sample ID	Longitude	Latitude	Date	V	SV	NV	TC	MC	SC	NC	ETC	EMC	ESC	VF	COL	COM	COS	SA	B	SND	BM	EBM	BH	HAL	GYP	HEX	CIR	MR
DU7-UTTR	-112.83787	41.06785	6/5/2018			X			X									X										
DU7-UTTR	-112.83787	41.05887	6/5/2018			X			X									X										
DU7-UTTR	-112.82601	41.15319	6/5/2018			X			X									X										
DU7-UTTR	-112.82601	41.14420	6/5/2018			X			X									X										
DU7-UTTR	-112.82601	41.13522	6/5/2018			X			X									X										
DU7-UTTR	-112.82601	41.09929	6/5/2018			X			X									X										
DU7-UTTR	-112.82601	41.09031	6/5/2018			X			X									X										
DU7-UTTR	-112.81415	41.15319	6/5/2018			X			X							X	X											
DU7-UTTR	-112.81415	41.14420	6/5/2018			X			X								X											
DU7-UTTR	-112.81415	41.13522	6/5/2018			X				X				X			X											
DU7-UTTR	-112.81415	41.12624	6/5/2018			X			X								X	X										
DU7-UTTR	-112.81415	41.11725	6/5/2018			X			X									X										
DU7-UTTR	-112.81415	41.10827	6/5/2018			X			X									X										
DU7-UTTR	-112.81415	41.09929	6/5/2018			X			X									X										
DU7-UTTR	-112.81415	41.09031	6/5/2018			X			X									X										

Sample ID	Longitude	Latitude	Date	V	SV	NV	TC	MC	SC	NC	ETC	EMC	ESC	VF	COL	COM	COS	SA	B	SND	BM	EBM	BH	HAL	GYP	HEX	CIR	MR
DU7-SU10	-112.84843	41.22056	4/3/2018			X				X							X											
DU7-SU10	-112.84843	41.21607	4/3/2018			X			X								X		X									
DU7-SU10	-112.84843	41.21158	4/3/2018			X				X				X			X						X					
DU7-SU10	-112.84381	41.21607	4/3/2018			X			X									X										
DU7-SU10	-112.84381	41.21158	4/3/2018			X			X								X						X					
DU7-SU10	-112.83788	41.21158	4/3/2018			X			X							X	X											
DU7-SU10	-112.83788	41.20709	4/3/2018	X						X				X														
DU7-SU10	-112.83195	41.20709	4/3/2018		X					X				X			X											
DU7-SU10	-112.83195	41.20260	4/3/2018			X			X								X	X										
DU7-SU10	-112.83195	41.19811	4/3/2018			X			X					X			X											
DU7-SU10	-112.82602	41.19811	4/3/2018			X			X							X	X									X		
DU7-SU10	-112.82602	41.19361	4/3/2018			X			X							X	X						X					
DU7-SU10	-112.82009	41.19361	4/3/2018			X			X							X	X											
DU7-SU10	-112.82009	41.18912	4/3/2018			X			X							X	X											

Sample ID	Longitude	Latitude	Date	V	SV	NV	TC	MC	SC	NC	ETC	EMC	ESC	VF	COL	COM	COS	SA	B	SND	BM	EBM	BH	HAL	GYP	HEX	CIR	MR
DU8-SU1	-112.27416	41.12317	10/24/2017			X			X																			
DU8-SU1	-112.26823	41.12317	10/24/2017			X			X							X		X										
DU8-SU1	-112.26230	41.11868	10/24/2017			X			X									X										
DU8-SU1	-112.26230	41.10521	10/24/2017			X			X									X										
DU8-SU1	-112.26230	41.12317	10/24/2017			X			X									X										
DU8-SU1	-112.25637	41.11868	10/24/2017			X		X										X	X									
DU8-SU1	-112.25637	41.11419	10/24/2017			X			X									X										
DU8-SU1	-112.25637	41.10970	10/24/2017			X			X									X										
DU8-SU1	-112.25637	41.10521	10/24/2017			X			X									X										
DU8-SU1	-112.25637	41.10072	10/24/2017			X			X									X										
DU8-SU1	-112.25637	41.09622	10/24/2017			X			X									X										
DU8-SU1	-112.25637	41.09173	10/24/2017			X			X									X										
DU8-SU1	-112.25044	41.11419	10/24/2017			X		X										X	X									
DU8-SU1	-112.25044	41.10970	10/24/2017			X			X							X		X	X									
DU8-SU1	-112.25044	41.10521	10/24/2017			X			X									X										
DU8-SU1	-112.25044	41.10072	10/24/2017			X			X									X	X									
DU8-SU1	-112.25044	41.09622	10/24/2017			X			X									X	X									
DU8-SU1	-112.25044	41.09173	10/24/2017			X			X									X	X									
DU8-SU1	-112.24451	41.10970	10/24/2017			X			X									X	X									
DU8-SU1	-112.24451	41.10521	10/24/2017			X			X									X	X									
DU8-SU1	-112.24451	41.10072	10/24/2017			X			X									X	X									
DU8-SU1	-112.24451	41.09622	10/24/2017			X			X									X	X									
DU8-SU1	-112.24451	41.09173	10/24/2017			X			X									X										
DU8-SU1	-112.24451	41.08724	10/24/2017			X			X									X										
DU8-SU1	-112.23858	41.10072	10/24/2017			X			X									X	X									
DU8-SU1	-112.23858	41.09622	10/24/2017			X			X									X	X									
DU8-SU1	-112.23858	41.09173	10/24/2017			X			X									X										
DU8-SU1	-112.23858	41.08724	10/24/2017			X			X									X										
DU8-SU1	-112.23858	41.08275	10/24/2017			X			X									X	X									
DU8-SU1	-112.23265	41.09173	10/24/2017			X			X									X	X									
DU8-SU1	-112.23265	41.08724	10/24/2017			X			X									X	X									
DU8-SU1	-112.23265	41.08275	10/24/2017			X			X									X	X									
DU8-SU1	-112.23265	41.07826	10/24/2017			X			X									X	X									
DU8-SU1	-112.22672	41.08275	10/24/2017			X			X									X	X									
DU8-SU1	-112.22672	41.07826	10/24/2017			X			X									X	X									
DU8-SU1	-112.22672	41.07377	10/24/2017			X				X								X	X									
DU8-SU1	-112.22079	41.07826	10/24/2017			X			X									X	X									
DU8-SU1	-112.22079	41.07377	10/24/2017			X			X									X										

Sample ID	Longitude	Latitude	Date	V	SV	NV	TC	MC	SC	NC	ETC	EMC	ESC	VF	COL	COM	COS	SA	B	SND	BM	EBM	BH	HAL	GYP	HEX	CIR	MR
DU8-SU2	-112.19705	41.12317	12/22/2017		X				X										X									
DU8-SU2	-112.19705	41.11868	12/22/2017		X				X										X									
DU8-SU2	-112.19112	41.12317	12/22/2017		X				X										X									
DU8-SU2	-112.19112	41.11868	12/22/2017		X				X										X									
DU8-SU2	-112.19112	41.11419	12/22/2017		X				X										X									
DU8-SU2	-112.18519	41.11868	12/22/2017		X				X										X									
DU8-SU2	-112.18519	41.11419	12/22/2017		X				X																			
DU8-SU2	-112.17926	41.10970	12/22/2017		X				X																			
DU8-SU2	-112.16740	41.10521	12/22/2017		X				X																			
DU8-SU2	-112.16740	41.10072	12/22/2017		X				X																			
DU8-SU2	-112.16147	41.10072	12/22/2017		X				X																			
DU8-SU2	-112.16147	41.09622	12/22/2017		X								X															
DU8-SU2	-112.16147	41.09173	12/22/2017		X				X																			
DU8-SU2	-112.15554	41.09173	12/22/2017		X				X																			

Sample ID	Longitude	Latitude	Date	V	SV	NV	TC	MC	SC	NC	ETC	EMC	ESC	VF	COL	COM	COS	SA	B	SND	BM	EBM	BH	HAL	GYP	HEX	CIR	MR
DU8-SU3	-112.37500	41.17707	10/29/2017		X					X				X														
DU8-SU3	-112.36907	41.17707	10/29/2017			X				X				X														
DU8-SU3	-112.36314	41.18156	10/29/2017	X																								
DU8-SU3	-112.35721	41.18156	10/29/2017		X			X									X											
DU8-SU3	-112.35128	41.18156	10/29/2017			X			X								X											
DU8-SU3	-112.34535	41.18156	10/29/2017	X																								
DU8-SU3	-112.33942	41.18156	10/29/2017	X																								
DU8-SU3	-112.33349	41.17707	10/29/2017			X		X									X											
DU8-SU3	-112.33349	41.17258	10/29/2017	X																								
DU8-SU3	-112.32756	41.17258	10/29/2017		X			X								X	X											
DU8-SU3	-112.32756	41.16809	10/29/2017		X									X			X											
DU8-SU3	-112.32163	41.16809	10/29/2017			X		X								X	X											
DU8-SU3	-112.32163	41.16360	10/29/2017	X																								
DU8-SU3	-112.31570	41.15911	10/29/2017			X	X									X	X											
DU8-SU3	-112.31570	41.15462	10/29/2017			X			X								X											
DU8-SU3	-112.31570	41.15012	10/29/2017		X				X																			
DU8-SU3	-112.30977	41.15462	10/29/2017		X					X				X	X	X												
DU8-SU3	-112.30977	41.15012	10/29/2017		X								X	X														
DU8-SU3	-112.30977	41.14114	10/29/2017			X			X									X										
DU8-SU3	-112.30977	41.13665	10/29/2017			X			X									X										
DU8-SU3	-112.30384	41.15012	10/29/2017		X					X				X	X	X												
DU8-SU3	-112.30384	41.14563	10/29/2017			X							X	X														
DU8-SU3	-112.30384	41.14114	10/29/2017			X							X					X										
DU8-SU3	-112.30384	41.13665	10/29/2017			X							X	X														
DU8-SU3	-112.29791	41.14563	10/29/2017		X			X																				
DU8-SU3	-112.29791	41.14114	10/29/2017		X					X				X														
DU8-SU3	-112.29791	41.13665	10/29/2017			X							X	X														
DU8-SU3	-112.29197	41.14114	10/29/2017			X			X																			
DU8-SU3	-112.29197	41.13665	10/29/2017			X			X									X										
DU8-SU3	-112.29197	41.13216	10/29/2017			X			X																			
DU8-SU3	-112.28604	41.13665	10/29/2017			X			X									X										
DU8-SU3	-112.28604	41.12767	10/29/2017			X							X	X														
DU8-SU3	-112.28011	41.13216	10/29/2017			X							X	X														
DU8-SU3	-112.28011	41.12767	10/29/2017			X							X															
DU8-SU3	-112.27418	41.13216	10/29/2017			X					X					X												
DU8-SU3	-112.27418	41.12767	10/29/2017			X	X											X										
DU8-SU3	-112.26825	41.12767	10/29/2017			X			X									X										
DU8-SU3	-112.26232	41.12767	10/29/2017			X			X										X									

Sample ID	Longitude	Latitude	Date	V	SV	NV	TC	MC	SC	NC	ETC	EMC	ESC	VF	COL	COM	COS	SA	B	SND	BM	EBM	BH	HAL	GYP	HEX	CIR	MR
DU8-SU4	-112.32161	41.23546	5/24/2018			X			X									X										
DU8-SU4	-112.32161	41.23097	5/24/2018			X		X										X										
DU8-SU4	-112.32161	41.22648	5/24/2018			X		X										X										
DU8-SU4	-112.31568	41.23546	5/24/2018			X			X									X										
DU8-SU4	-112.31568	41.23097	5/24/2018			X			X									X										
DU8-SU4	-112.31568	41.22648	5/24/2018			X			X									X										
DU8-SU4	-112.30975	41.23546	5/24/2018			X			X									X										
DU8-SU4	-112.30975	41.23097	5/24/2018			X			X									X										
DU8-SU4	-112.30975	41.22648	5/24/2018			X			X									X										
DU8-SU4	-112.30975	41.22199	5/24/2018			X			X									X										
DU8-SU4	-112.30382	41.23546	5/24/2018			X			X									X										
DU8-SU4	-112.30382	41.23097	5/24/2018			X			X									X										
DU8-SU4	-112.30382	41.22648	5/24/2018			X			X									X										
DU8-SU4	-112.30382	41.22199	5/24/2018			X			X									X										
DU8-SU4	-112.30382	41.21750	5/24/2018			X			X									X	X									
DU8-SU4	-112.30382	41.21301	5/24/2018			X			X									X										
DU8-SU4	-112.29789	41.23546	5/24/2018			X			X									X										
DU8-SU4	-112.29789	41.23097	5/24/2018			X			X									X										
DU8-SU4	-112.29789	41.22648	5/24/2018			X			X									X										
DU8-SU4	-112.29789	41.22199	5/24/2018			X			X									X										
DU8-SU4	-112.29789	41.21750	5/24/2018			X			X									X	X									
DU8-SU4	-112.29789	41.21301	5/24/2018			X			X									X										
DU8-SU4	-112.29789	41.20851	5/24/2018			X			X									X										
DU8-SU4	-112.29196	41.23995	5/24/2018			X			X									X										
DU8-SU4	-112.29196	41.23546	5/24/2018			X			X									X										
DU8-SU4	-112.29196	41.23097	5/24/2018			X			X									X										
DU8-SU4	-112.29196	41.22648	5/24/2018			X			X									X										
DU8-SU4	-112.29196	41.22199	5/24/2018			X			X									X										
DU8-SU4	-112.29196	41.21750	5/24/2018			X			X									X										
DU8-SU4	-112.29196	41.21301	5/24/2018			X			X									X										
DU8-SU4	-112.29196	41.20851	5/24/2018			X			X									X										
DU8-SU4	-112.29196	41.20402	5/24/2018			X													X		X							
DU8-SU4	-112.28603	41.23995	5/24/2018			X			X									X										
DU8-SU4	-112.28603	41.23546	5/24/2018			X			X									X										
DU8-SU4	-112.28603	41.23097	5/24/2018			X			X									X										
DU8-SU4	-112.28603	41.22648	5/24/2018			X			X									X										
DU8-SU4	-112.28603	41.22199	5/24/2018			X			X									X										
DU8-SU4	-112.28603	41.21750	5/24/2018			X		X						X				X										
DU8-SU4	-112.28603	41.21301	5/24/2018			X							X	X														
DU8-SU4	-112.28603	41.20851	5/24/2018			X							X	X														
DU8-SU4	-112.28603	41.20402	5/24/2018			X												X			X							
DU8-SU4	-112.28603	41.19953	5/24/2018			X												X			X							
DU8-SU4	-112.28603	41.19504	5/24/2018			X			X									X	X									
DU8-SU4	-112.28010	41.23995	5/24/2018			X			X									X										
DU8-SU4	-112.28010	41.23546	5/24/2018			X			X									X										
DU8-SU4	-112.28010	41.23097	5/24/2018			X			X									X										
DU8-SU4	-112.28010	41.22648	5/24/2018			X			X									X										
DU8-SU4	-112.28010	41.22199	5/24/2018			X			X									X										
DU8-SU4	-112.28010	41.21750	5/24/2018			X		X										X										
DU8-SU4	-112.28010	41.21301	5/24/2018		X								X	X														
DU8-SU4	-112.28010	41.20851	5/24/2018			X							X	X														
DU8-SU4	-112.28010	41.20402	5/24/2018			X						X		X														
DU8-SU4	-112.28010	41.19953	5/24/2018			X												X			X							
DU8-SU4	-112.28010	41.19504	5/24/2018			X												X			X							
DU8-SU4	-112.28010	41.19055	5/24/2018			X			X									X	X									

Sample ID	Longitude	Latitude	Date	V	SV	NV	TC	MC	SC	NC	ETC	EMC	ESC	VF	COL	COM	COS	SA	B	SND	BM	EBM	BH	HAL	GYP	HEX	CIR	MR
DU8-SU5	-112.20892	41.15910	12/2/2017		X							X		X				X										
DU8-SU5	-112.20892	41.15461	12/2/2017			X			X									X										
DU8-SU5	-112.20892	41.15012	12/2/2017			X			X									X										
DU8-SU5	-112.20892	41.14563	12/2/2017			X					X							X								X		
DU8-SU5	-112.20892	41.14114	12/2/2017		X						X							X								X		
DU8-SU5	-112.20892	41.13665	12/2/2017			X			X									X				X						
DU8-SU5	-112.20892	41.13215	12/2/2017		X						X							X								X		
DU8-SU5	-112.20892	41.12766	12/2/2017			X					X							X				X				X		
DU8-SU5	-112.20299	41.15910	12/2/2017		X				X									X										
DU8-SU5	-112.20299	41.15461	12/2/2017		X						X																	
DU8-SU5	-112.20299	41.15012	12/2/2017		X				X									X										
DU8-SU5	-112.20299	41.14563	12/2/2017			X					X							X								X		
DU8-SU5	-112.20299	41.14114	12/2/2017			X				X									X									
DU8-SU5	-112.20299	41.13665	12/2/2017			X			X										X									
DU8-SU5	-112.20299	41.13215	12/2/2017		X				X										X									
DU8-SU5	-112.20299	41.12766	12/2/2017			X				X									X									
DU8-SU5	-112.19706	41.13215	12/2/2017		X						X															X		
DU8-SU5	-112.19706	41.12766	12/2/2017			X			X										X									
DU8-SU5	-112.19113	41.13215	12/2/2017			X			X									X										
DU8-SU5	-112.19113	41.12766	12/2/2017			X			X										X									
DU8-SU5	-112.18520	41.13665	12/2/2017		X				X																			
DU8-SU5	-112.18520	41.13215	12/2/2017		X			X																				
DU8-SU5	-112.17927	41.13215	12/2/2017			X			X																			

Sample ID	Longitude	Latitude	Date	V	SV	NV	TC	MC	SC	NC	ETC	EMC	ESC	VF	COL	COM	COS	SA	B	SND	BM	EBM	BH	HAL	GYP	HEX	CIR	MR
DU8-SU6	-112.27416	41.23995	5/22/2018			X			X									X										
DU8-SU6	-112.27416	41.23546	5/22/2018			X			X									X										
DU8-SU6	-112.27416	41.23097	5/22/2018			X			X									X										
DU8-SU6	-112.27416	41.22648	5/22/2018			X					X							X										
DU8-SU6	-112.27416	41.22199	5/22/2018			X			X									X										
DU8-SU6	-112.27416	41.21750	5/22/2018			X			X									X										
DU8-SU6	-112.27416	41.21300	5/22/2018		X				X					X														
DU8-SU6	-112.27416	41.20851	5/22/2018			X			X									X										
DU8-SU6	-112.27416	41.20402	5/22/2018			X			X									X										
DU8-SU6	-112.27416	41.19953	5/22/2018			X			X																			
DU8-SU6	-112.27416	41.19504	5/22/2018		X																X							
DU8-SU6	-112.27416	41.19055	5/22/2018			X			X																	X		
DU8-SU6	-112.26823	41.23995	5/22/2018			X			X									X										
DU8-SU6	-112.26823	41.23546	5/22/2018			X			X									X										
DU8-SU6	-112.26823	41.23097	5/22/2018			X			X									X										
DU8-SU6	-112.26823	41.22648	5/22/2018			X			X									X										
DU8-SU6	-112.26823	41.22199	5/22/2018			X			X									X										
DU8-SU6	-112.26823	41.21750	5/22/2018			X			X									X										
DU8-SU6	-112.26823	41.21300	5/22/2018		X				X																			
DU8-SU6	-112.26823	41.20851	5/22/2018			X				X																		
DU8-SU6	-112.26823	41.19953	5/22/2018			X			X																			
DU8-SU6	-112.26823	41.19504	5/22/2018			X			X																			
DU8-SU6	-112.26823	41.19055	5/22/2018			X			X																			
DU8-SU6	-112.26230	41.23995	5/22/2018			X			X									X										
DU8-SU6	-112.26230	41.23546	5/22/2018			X			X									X										
DU8-SU6	-112.26230	41.23097	5/22/2018			X			X									X										
DU8-SU6	-112.26230	41.22648	5/22/2018			X			X									X										
DU8-SU6	-112.26230	41.22199	5/22/2018			X			X									X										
DU8-SU6	-112.26230	41.21750	5/22/2018			X						X		X														
DU8-SU6	-112.26230	41.21300	5/22/2018		X			X						X														
DU8-SU6	-112.25637	41.23995	5/22/2018			X			X									X										
DU8-SU6	-112.25637	41.23546	5/22/2018			X			X									X										
DU8-SU6	-112.25637	41.23097	5/22/2018			X			X									X										
DU8-SU6	-112.25637	41.22648	5/22/2018			X			X									X										
DU8-SU6	-112.25637	41.22199	5/22/2018			X			X									X										
DU8-SU6	-112.25637	41.21750	5/22/2018		X				X									X										
DU8-SU6	-112.25637	41.21300	5/22/2018		X				X																			
DU8-SU6	-112.25044	41.23995	5/22/2018			X			X					X				X										
DU8-SU6	-112.25044	41.23546	5/22/2018			X			X									X										
DU8-SU6	-112.25044	41.23097	5/22/2018			X			X									X										
DU8-SU6	-112.25044	41.22648	5/22/2018			X			X									X										
DU8-SU6	-112.25044	41.22199	5/22/2018			X			X									X										
DU8-SU6	-112.25044	41.21750	5/22/2018		X								X	X				X										
DU8-SU6	-112.25044	41.21300	5/22/2018		X				X																			
DU8-SU6	-112.24451	41.23995	5/22/2018			X			X					X				X										
DU8-SU6	-112.24451	41.23546	5/22/2018			X			X									X										
DU8-SU6	-112.24451	41.23097	5/22/2018			X			X									X										
DU8-SU6	-112.24451	41.22648	5/22/2018			X			X									X										
DU8-SU6	-112.24451	41.22199	5/22/2018			X			X									X										
DU8-SU6	-112.24451	41.21750	5/22/2018		X								X	X				X										
DU8-SU6	-112.23858	41.23995	5/22/2018			X							X	X				X										
DU8-SU6	-112.23858	41.23546	5/22/2018			X			X									X										
DU8-SU6	-112.23858	41.23097	5/22/2018	X										X														
DU8-SU6	-112.23858	41.22648	5/22/2018			X			X									X										
DU8-SU6	-112.23858	41.22199	5/22/2018			X		X						X				X										
DU8-SU6	-112.23265	41.23995	5/22/2018			X							X	X				X										
DU8-SU6	-112.23265	41.23546	5/22/2018			X			X					X				X										
DU8-SU6	-112.23265	41.23097	5/22/2018		X				X									X										
DU8-SU6	-112.23265	41.22648	5/22/2018			X			X									X										
DU8-SU6	-112.22672	41.23995	5/22/2018			X			X									X										
DU8-SU6	-112.22672	41.23546	5/22/2018	X																								
DU8-SU6	-112.22672	41.23097	5/22/2018			X					X			X												X		
DU8-SU6	-112.22672	41.22648	5/22/2018		X				X					X														

Sample ID	Longitude	Latitude	Date	V	SV	NV	TC	MC	SC	NC	ETC	EMC	ESC	VF	COL	COM	COS	SA	B	SND	BM	EBM	BH	HAL	GYP	HEX	CIR	MR
DU9-SU1	-112.87780	41.25550	8/8/2018			X		X									X	X										
DU9-SU1	-112.87780	41.23528	8/8/2018			X							X					X										
DU9-SU1	-112.86890	41.25550	8/8/2018			X			X							X		X										
DU9-SU1	-112.86890	41.24876	8/8/2018			X			X							X	X											
DU9-SU1	-112.86890	41.24203	8/8/2018			X			X									X										
DU9-SU1	-112.86890	41.23529	8/8/2018			X			X									X										
DU9-SU1	-112.86890	41.22855	8/8/2018			X			X								X	X										
DU9-SU1	-112.86001	41.25550	8/8/2018			X			X									X	X					X				
DU9-SU1	-112.86001	41.24876	8/8/2018			X			X									X	X					X				
DU9-SU1	-112.86001	41.24203	8/8/2018		X								X				X											
DU9-SU1	-112.86001	41.23529	8/8/2018			X							X					X										
DU9-SU1	-112.86001	41.22855	8/8/2018			X			X									X	X									
DU9-SU1	-112.85111	41.25550	8/8/2018			X			X								X	X										
DU9-SU1	-112.85111	41.24876	8/8/2018			X			X								X	X										
DU9-SU1	-112.85111	41.24203	8/8/2018			X			X								X	X										
DU9-SU1	-112.85111	41.23529	8/8/2018			X			X								X	X										
DU9-SU1	-112.85111	41.22855	8/8/2018			X			X									X										
DU9-SU1	-112.84222	41.25550	8/8/2018			X			X									X						X				
DU9-SU1	-112.84222	41.24876	8/8/2018			X			X									X						X				
DU9-SU1	-112.84222	41.24203	8/8/2018			X			X									X						X				
DU9-SU1	-112.84222	41.23529	8/8/2018			X			X								X	X										
DU9-SU1	-112.84222	41.22855	8/8/2018			X			X									X										
DU9-SU1	-112.83332	41.25550	8/8/2018			X			X									X						X				
DU9-SU1	-112.83332	41.23529	8/8/2018			X			X								X	X										
DU9-SU1	-112.83332	41.22855	8/8/2018			X			X									X										

Sample ID	Longitude	Latitude	Date	V	SV	NV	TC	MC	SC	NC	ETC	EMC	ESC	VF	COL	COM	COS	SA	B	SND	BM	EBM	BH	HAL	GYP	HEX	CIR	MR
DU9-SU2	-112.95001	41.30271	8/7/2018			X			X									X						X				
DU9-SU2	-112.94111	41.30271	8/7/2018			X			X								X											
DU9-SU2	-112.94111	41.29597	8/7/2018			X			X									X						X				
DU9-SU2	-112.93222	41.30271	8/7/2018			X			X									X										
DU9-SU2	-112.93222	41.29597	8/7/2018			X			X									X						X				
DU9-SU2	-112.92332	41.30271	8/7/2018			X			X								X											
DU9-SU2	-112.92332	41.29597	8/7/2018			X			X								X											
DU9-SU2	-112.92332	41.28924	8/7/2018			X			X									X						X				
DU9-SU2	-112.91443	41.30271	8/7/2018			X			X								X											
DU9-SU2	-112.91443	41.29597	8/7/2018			X			X								X											
DU9-SU2	-112.91443	41.28924	8/7/2018			X			X									X						X				
DU9-SU2	-112.90553	41.30271	8/7/2018			X			X									X						X				
DU9-SU2	-112.90553	41.29597	8/7/2018			X			X									X						X				
DU9-SU2	-112.90553	41.28924	8/7/2018			X			X									X						X				
DU9-SU2	-112.90553	41.28250	8/7/2018			X			X									X						X				
DU9-SU2	-112.89664	41.30271	8/7/2018			X			X									X						X				
DU9-SU2	-112.89664	41.29597	8/7/2018			X			X									X						X				
DU9-SU2	-112.89664	41.28924	8/7/2018			X			X								X	X										
DU9-SU2	-112.89664	41.28250	8/7/2018			X			X									X						X				
DU9-SU2	-112.89664	41.27576	8/7/2018			X			X									X						X				
DU9-SU2	-112.88774	41.30271	8/7/2018			X			X									X						X				
DU9-SU2	-112.88774	41.29597	8/7/2018			X			X									X						X				
DU9-SU2	-112.88774	41.28924	8/7/2018			X			X									X						X				
DU9-SU2	-112.88774	41.28250	8/7/2018			X			X								X	X	X									
DU9-SU2	-112.88774	41.27576	8/7/2018			X			X									X	X									
DU9-SU2	-112.88774	41.26903	8/7/2018			X			X									X						X				
DU9-SU2	-112.88774	41.26229	8/7/2018			X			X									X						X				
DU9-SU2	-112.87780	41.30266	8/7/2018			X			X									X						X				
DU9-SU2	-112.87780	41.29592	8/7/2018			X			X									X						X				
DU9-SU2	-112.87780	41.28919	8/7/2018			X			X									X						X				
DU9-SU2	-112.87780	41.28245	8/7/2018			X			X									X						X				
DU9-SU2	-112.87780	41.27571	8/7/2018			X			X									X	X					X				
DU9-SU2	-112.87780	41.26898	8/7/2018			X			X									X						X				
DU9-SU2	-112.87780	41.26224	8/7/2018			X			X									X						X				
DU9-SU2	-112.86890	41.30266	8/7/2018			X			X									X						X				
DU9-SU2	-112.86890	41.29592	8/7/2018			X			X									X						X				
DU9-SU2	-112.86890	41.28919	8/7/2018			X			X									X						X				
DU9-SU2	-112.86890	41.28245	8/7/2018			X			X									X						X				
DU9-SU2	-112.86890	41.27571	8/7/2018			X			X									X						X				
DU9-SU2	-112.86890	41.26898	8/7/2018			X			X									X						X				
DU9-SU2	-112.86890	41.26224	8/7/2018			X			X									X						X				
DU9-SU2	-112.86001	41.27571	8/7/2018			X			X									X						X				
DU9-SU2	-112.86001	41.26898	8/7/2018			X			X									X						X				
DU9-SU2	-112.86001	41.26224	8/7/2018			X			X									X						X				
DU9-SU2	-112.85111	41.27571	8/7/2018			X			X									X						X				
DU9-SU2	-112.85111	41.26898	8/7/2018			X			X									X						X				
DU9-SU2	-112.85111	41.26224	8/7/2018			X			X									X						X				
DU9-SU2	-112.84222	41.26898	8/7/2018			X			X									X						X				
DU9-SU2	-112.84222	41.26224	8/7/2018			X			X									X						X				
DU9-SU2	-112.83332	41.26898	8/7/2018			X			X									X						X				
DU9-SU2	-112.83332	41.26224	8/7/2018			X			X									X						X				

Sample ID	Longitude	Latitude	Date	V	SV	NV	TC	MC	SC	NC	ETC	EMC	ESC	VF	COL	COM	COS	SA	B	SND	BM	EBM	BH	HAL	GYP	HEX	CIR	MR
DU9-SU3	-112.96781	41.32966	8/7/2018			X			X									X						X				
DU9-SU3	-112.95891	41.32966	8/7/2018			X			X									X						X				
DU9-SU3	-112.95891	41.32292	8/7/2018			X			X									X						X				
DU9-SU3	-112.95891	41.31619	8/7/2018			X			X									X						X				
DU9-SU3	-112.95891	41.30945	8/7/2018			X			X									X						X				
DU9-SU3	-112.95002	41.33640	8/7/2018			X			X								X	X										
DU9-SU3	-112.95002	41.32966	8/7/2018			X			X								X	X										
DU9-SU3	-112.95002	41.32293	8/7/2018			X			X								X											
DU9-SU3	-112.95002	41.31619	8/7/2018			X			X								X											
DU9-SU3	-112.95002	41.30945	8/7/2018			X			X									X						X				
DU9-SU3	-112.94112	41.33640	8/7/2018			X			X									X						X				
DU9-SU3	-112.94112	41.32966	8/7/2018			X			X									X						X				
DU9-SU3	-112.94112	41.32293	8/7/2018			X			X								X											
DU9-SU3	-112.94112	41.31619	8/7/2018			X			X								X											
DU9-SU3	-112.94112	41.30945	8/7/2018			X			X								X	X										
DU9-SU3	-112.93223	41.33640	8/7/2018			X			X									X						X				
DU9-SU3	-112.93223	41.32966	8/7/2018			X			X									X						X				
DU9-SU3	-112.93223	41.32293	8/7/2018			X			X									X						X				
DU9-SU3	-112.93223	41.31619	8/7/2018			X			X									X										
DU9-SU3	-112.93223	41.30945	8/7/2018			X			X									X										
DU9-SU3	-112.92333	41.33640	8/7/2018			X			X									X						X				
DU9-SU3	-112.92333	41.32966	8/7/2018			X			X									X						X				
DU9-SU3	-112.92333	41.32293	8/7/2018			X			X									X						X				
DU9-SU3	-112.92333	41.31619	8/7/2018			X			X									X										
DU9-SU3	-112.92333	41.30945	8/7/2018			X			X									X										
DU9-SU3	-112.91444	41.32966	8/7/2018			X			X									X						X				
DU9-SU3	-112.91444	41.32293	8/7/2018			X			X									X						X				
DU9-SU3	-112.91444	41.31619	8/7/2018			X			X									X						X				
DU9-SU3	-112.91444	41.30945	8/7/2018			X			X									X						X				
DU9-SU3	-112.90554	41.32966	8/7/2018			X			X									X						X				
DU9-SU3	-112.90554	41.32293	8/7/2018			X			X									X						X				
DU9-SU3	-112.90554	41.31619	8/7/2018			X			X									X						X				
DU9-SU3	-112.90554	41.30945	8/7/2018			X			X									X						X				
DU9-SU3	-112.89665	41.32966	8/7/2018			X			X									X						X				
DU9-SU3	-112.89665	41.32293	8/7/2018			X			X									X						X				
DU9-SU3	-112.89665	41.31619	8/7/2018			X			X									X						X				
DU9-SU3	-112.89665	41.30945	8/7/2018			X			X									X						X				
DU9-SU3	-112.88775	41.31619	8/7/2018			X			X									X						X				
DU9-SU3	-112.88775	41.30945	8/7/2018			X			X									X						X				

Sample ID	Longitude	Latitude	Date	V	SV	NV	TC	MC	SC	NC	ETC	EMC	ESC	VF	COL	COM	COS	SA	B	SND	BM	EBM	BH	HAL	GYP	HEX	CIR	MR
DU9-SU4	-112.96754	41.41040	7/1/2018			X			X									X										
DU9-SU4	-112.96754	41.40366	7/1/2018			X			X									X										
DU9-SU4	-112.96754	41.39692	7/1/2018			X			X									X										
DU9-SU4	-112.96754	41.39019	7/1/2018			X				X								X	X									
DU9-SU4	-112.96754	41.38345	7/1/2018			X			X									X										
DU9-SU4	-112.96754	41.37671	7/1/2018			X			X								X	X										
DU9-SU4	-112.96754	41.36998	7/1/2018			X			X								X											
DU9-SU4	-112.96754	41.36324	7/1/2018			X			X							X	X	X										
DU9-SU4	-112.96754	41.35650	7/1/2018			X			X									X										
DU9-SU4	-112.96754	41.34977	7/1/2018			X			X							X		X										
DU9-SU4	-112.96754	41.34303	7/1/2018			X			X									X										
DU9-SU4	-112.95864	41.41040	7/1/2018			X			X									X										
DU9-SU4	-112.95864	41.40366	7/1/2018			X			X									X	X									
DU9-SU4	-112.95864	41.39692	7/1/2018			X			X									X										
DU9-SU4	-112.95864	41.39019	7/1/2018			X			X									X						X				
DU9-SU4	-112.95864	41.38345	7/1/2018			X			X							X		X										
DU9-SU4	-112.95864	41.37671	7/1/2018			X			X									X										
DU9-SU4	-112.95864	41.36998	7/1/2018			X			X									X										
DU9-SU4	-112.95864	41.36324	7/1/2018			X			X									X										
DU9-SU4	-112.95864	41.35650	7/1/2018			X			X									X										
DU9-SU4	-112.95864	41.34977	7/1/2018			X			X									X										
DU9-SU4	-112.95864	41.34303	7/1/2018			X			X									X										
DU9-SU4	-112.94975	41.41040	7/1/2018			X		X										X						X				
DU9-SU4	-112.94975	41.39692	7/1/2018			X		X										X						X				
DU9-SU4	-112.94975	41.39019	7/1/2018			X			X									X										
DU9-SU4	-112.94975	41.38345	7/1/2018			X			X							X	X											
DU9-SU4	-112.94975	41.37671	7/1/2018			X			X									X										
DU9-SU4	-112.94975	41.36998	7/1/2018			X			X									X										
DU9-SU4	-112.94975	41.36324	7/1/2018			X			X									X										
DU9-SU4	-112.94975	41.35650	7/1/2018			X			X							X												
DU9-SU4	-112.94975	41.34977	7/1/2018			X			X							X		X										
DU9-SU4	-112.94085	41.39019	7/1/2018			X		X										X						X				
DU9-SU4	-112.94085	41.38345	7/1/2018			X		X										X						X				
DU9-SU4	-112.94085	41.37671	7/1/2018			X		X										X						X				
DU9-SU4	-112.94085	41.36998	7/1/2018			X		X										X						X				
DU9-SU4	-112.94085	41.36324	7/1/2018			X		X										X						X				
DU9-SU4	-112.94085	41.35650	7/1/2018			X		X										X						X				
DU9-SU4	-112.94085	41.34977	7/1/2018			X		X										X						X				

Sample ID	Longitude	Latitude	Date	V	SV	NV	TC	MC	SC	NC	ETC	EMC	ESC	VF	COL	COM	COS	SA	B	SND	BM	EBM	BH	HAL	GYP	HEX	CIR	MR
DU9-SU5	-113.02149	41.41040	5/18/2018			X			X									X										
DU9-SU5	-113.02149	41.40377	5/18/2018		X				X							X	X											
DU9-SU5	-113.01250	41.41040	5/18/2018			X			X								X	X	X									
DU9-SU5	-113.01250	41.40377	5/18/2018			X			X							X	X	X										
DU9-SU5	-113.01250	41.39715	5/18/2018			X			X								X	X										
DU9-SU5	-113.01250	41.39052	5/18/2018		X				X							X												
DU9-SU5	-113.00351	41.41040	5/18/2018			X			X							X		X										
DU9-SU5	-113.00351	41.40377	5/18/2018			X			X									X										
DU9-SU5	-113.00351	41.39715	5/18/2018			X			X							X		X										
DU9-SU5	-113.00351	41.39052	5/18/2018			X			X									X										
DU9-SU5	-113.00351	41.38390	5/18/2018			X			X							X	X	X										
DU9-SU5	-113.00351	41.37727	5/18/2018			X			X							X	X	X										
DU9-SU5	-113.00351	41.37065	5/18/2018			X			X									X										
DU9-SU5	-113.00351	41.36402	5/18/2018			X			X							X		X										
DU9-SU5	-113.00351	41.35740	5/18/2018			X			X									X	X									
DU9-SU5	-112.99451	41.41040	5/18/2018			X			X									X										
DU9-SU5	-112.99451	41.40377	5/18/2018			X			X									X										
DU9-SU5	-112.99451	41.39715	5/18/2018			X			X								X	X										
DU9-SU5	-112.99451	41.39052	5/18/2018			X			X									X										
DU9-SU5	-112.99451	41.38390	5/18/2018			X			X								X	X										
DU9-SU5	-112.99451	41.37727	5/18/2018			X			X								X	X										
DU9-SU5	-112.99451	41.37065	5/18/2018			X			X							X	X	X										
DU9-SU5	-112.99451	41.36402	5/18/2018			X			X								X	X										
DU9-SU5	-112.99451	41.35740	5/18/2018			X			X								X	X										
DU9-SU5	-112.99451	41.35077	5/18/2018			X			X								X	X	X									
DU9-SU5	-112.99451	41.34415	5/18/2018			X			X									X	X					X				
DU9-SU5	-112.98552	41.41040	5/18/2018			X			X									X										
DU9-SU5	-112.98552	41.40377	5/18/2018			X			X								X	X										
DU9-SU5	-112.98552	41.39715	5/18/2018			X			X								X	X										
DU9-SU5	-112.98552	41.39052	5/18/2018			X			X								X	X										
DU9-SU5	-112.98552	41.38390	5/18/2018			X			X								X	X										
DU9-SU5	-112.98552	41.37727	5/18/2018			X			X								X	X										
DU9-SU5	-112.98552	41.37065	5/18/2018			X			X								X	X										
DU9-SU5	-112.98552	41.36402	5/18/2018			X			X									X										
DU9-SU5	-112.98552	41.35740	5/18/2018			X			X									X										
DU9-SU5	-112.98552	41.35077	5/18/2018			X			X							X	X	X										
DU9-SU5	-112.98552	41.34415	5/18/2018			X			X									X										
DU9-SU5	-112.98552	41.33752	5/18/2018			X			X									X						X				
DU9-SU5	-112.97653	41.41040	5/18/2018			X			X									X										
DU9-SU5	-112.97653	41.40377	5/18/2018			X			X								X	X										
DU9-SU5	-112.97653	41.39715	5/18/2018			X			X								X	X										
DU9-SU5	-112.97653	41.39052	5/18/2018			X			X								X	X										
DU9-SU5	-112.97653	41.38390	5/18/2018			X			X									X										
DU9-SU5	-112.97653	41.37727	5/18/2018			X			X							X		X										
DU9-SU5	-112.97653	41.37065	5/18/2018			X			X								X	X	X									
DU9-SU5	-112.97653	41.36402	5/18/2018			X			X									X										
DU9-SU5	-112.97653	41.35740	5/18/2018			X			X									X										
DU9-SU5	-112.97653	41.35077	5/18/2018			X			X							X	X	X										
DU9-SU5	-112.97653	41.34415	5/18/2018			X			X									X										
DU9-SU5	-112.97653	41.33752	5/18/2018			X			X									X						X				

Sample ID	Longitude	Latitude	Date	V	SV	NV	TC	MC	SC	NC	ETC	EMC	ESC	VF	COL	COM	COS	SA	B	SND	BM	EBM	BH	HAL	GYP	HEX	CIR	MR
DU9-SU6	-113.02149	41.48327	7/3/2018			X			X									X										
DU9-SU6	-113.02149	41.47664	7/3/2018			X			X									X										
DU9-SU6	-113.02149	41.47002	7/3/2018			X			X									X										
DU9-SU6	-113.02149	41.46339	7/3/2018			X			X									X										
DU9-SU6	-113.02149	41.45677	7/3/2018			X			X									X										
DU9-SU6	-113.02149	41.45014	7/3/2018			X			X									X										
DU9-SU6	-113.02149	41.44352	7/3/2018			X			X									X										
DU9-SU6	-113.02149	41.43689	7/3/2018			X						X		X		X	X	X										
DU9-SU6	-113.02149	41.43027	7/3/2018			X			X								X	X										
DU9-SU6	-113.02149	41.42364	7/3/2018			X			X									X										
DU9-SU6	-113.02149	41.41702	7/3/2018			X			X									X										
DU9-SU6	-113.01250	41.48327	7/3/2018			X			X								X	X										
DU9-SU6	-113.01250	41.47664	7/3/2018			X			X								X	X										
DU9-SU6	-113.01250	41.47002	7/3/2018			X			X									X										
DU9-SU6	-113.01250	41.46339	7/3/2018			X			X									X										
DU9-SU6	-113.01250	41.45677	7/3/2018			X			X									X										
DU9-SU6	-113.01250	41.45014	7/3/2018			X			X								X	X										
DU9-SU6	-113.01250	41.44352	7/3/2018			X			X								X	X										
DU9-SU6	-113.01250	41.43689	7/3/2018			X			X								X	X										
DU9-SU6	-113.01250	41.43027	7/3/2018			X			X								X	X										
DU9-SU6	-113.01250	41.42364	7/3/2018			X			X								X	X										
DU9-SU6	-113.01250	41.41702	7/3/2018			X			X								X	X										
DU9-SU6	-113.00351	41.48327	7/3/2018			X			X								X	X										
DU9-SU6	-113.00351	41.47664	7/3/2018			X			X								X	X										
DU9-SU6	-113.00351	41.47002	7/3/2018			X			X								X	X										
DU9-SU6	-113.00351	41.46339	7/3/2018		X				X					X			X	X										
DU9-SU6	-113.00351	41.45677	7/3/2018			X			X									X	X									
DU9-SU6	-113.00351	41.45014	7/3/2018			X				X				X			X	X										
DU9-SU6	-113.00351	41.44352	7/3/2018			X			X								X	X										
DU9-SU6	-113.00351	41.43689	7/3/2018			X		X									X	X										
DU9-SU6	-113.00351	41.43027	7/3/2018			X		X									X	X										
DU9-SU6	-113.00351	41.42364	7/3/2018			X			X									X										
DU9-SU6	-113.00351	41.41702	7/3/2018			X			X									X										
DU9-SU6	-112.99452	41.48327	7/3/2018			X						X		X			X	X										
DU9-SU6	-112.99452	41.47664	7/3/2018			X			X								X	X										
DU9-SU6	-112.99452	41.47002	7/3/2018			X			X								X	X										
DU9-SU6	-112.99452	41.46339	7/3/2018		X				X					X			X	X										
DU9-SU6	-112.99452	41.45677	7/3/2018			X			X									X	X									
DU9-SU6	-112.99452	41.45014	7/3/2018			X			X								X	X	X									
DU9-SU6	-112.99452	41.44352	7/3/2018			X			X									X										
DU9-SU6	-112.99452	41.43689	7/3/2018			X			X									X										
DU9-SU6	-112.99452	41.43027	7/3/2018			X						X		X			X	X										
DU9-SU6	-112.99452	41.42364	7/3/2018			X						X		X			X	X										
DU9-SU6	-112.99452	41.41702	7/3/2018			X			X									X										
DU9-SU6	-112.98553	41.48327	7/3/2018			X			X								X	X										
DU9-SU6	-112.98553	41.47664	7/3/2018			X			X								X	X										
DU9-SU6	-112.98553	41.47002	7/3/2018			X			X								X	X										
DU9-SU6	-112.98553	41.46339	7/3/2018			X			X								X	X										
DU9-SU6	-112.98553	41.45677	7/3/2018			X			X					X			X	X										
DU9-SU6	-112.98553	41.45014	7/3/2018			X			X								X	X										
DU9-SU6	-112.98553	41.44352	7/3/2018			X			X								X	X										
DU9-SU6	-112.98553	41.43689	7/3/2018			X			X								X	X										
DU9-SU6	-112.98553	41.43027	7/3/2018			X			X									X										
DU9-SU6	-112.98553	41.42364	7/3/2018			X			X									X										
DU9-SU6	-112.98553	41.41702	7/3/2018			X			X									X										
DU9-SU6	-112.97654	41.48327	7/3/2018			X			X									X										
DU9-SU6	-112.97654	41.47664	7/3/2018			X			X									X	X									
DU9-SU6	-112.97654	41.47002	7/3/2018			X			X								X	X										
DU9-SU6	-112.97654	41.46339	7/3/2018			X			X								X	X										
DU9-SU6	-112.97654	41.45677	7/3/2018			X			X									X										
DU9-SU6	-112.97654	41.45014	7/3/2018			X			X					X			X	X										
DU9-SU6	-112.97654	41.44352	7/3/2018			X			X									X										
DU9-SU6	-112.97654	41.43689	7/3/2018			X			X									X										
DU9-SU6	-112.97654	41.43027	7/3/2018			X			X								X	X										
DU9-SU6	-112.97654	41.42364	7/3/2018			X			X									X										
DU9-SU6	-112.97654	41.41702	7/3/2018			X			X									X										

Sample ID	Longitude	Latitude	Date	V	SV	NV	TC	MC	SC	NC	ETC	EMC	ESC	VF	COL	COM	COS	SA	B	SND	BM	EBM	BH	HAL	GYP	HEX	CIR	MR
DU9-SU7	-112.96754	41.48327	7/14/2018			X		X								X	X	X										
DU9-SU7	-112.96754	41.47665	7/14/2018			X			X								X	X										
DU9-SU7	-112.96754	41.47002	7/14/2018			X			X									X						X				
DU9-SU7	-112.96754	41.46340	7/14/2018			X			X								X	X										
DU9-SU7	-112.96754	41.45677	7/14/2018			X			X								X	X										
DU9-SU7	-112.96754	41.45015	7/14/2018			X			X						X			X										
DU9-SU7	-112.96754	41.44352	7/14/2018		X					X							X	X										
DU9-SU7	-112.96754	41.43690	7/14/2018			X			X									X	X									
DU9-SU7	-112.96754	41.43027	7/14/2018			X			X									X	X									
DU9-SU7	-112.96754	41.42365	7/14/2018			X			X									X	X									
DU9-SU7	-112.96754	41.41702	7/14/2018			X			X									X										
DU9-SU7	-112.95855	41.48327	7/14/2018			X		X										X						X				
DU9-SU7	-112.95855	41.47665	7/14/2018			X		X										X						X				
DU9-SU7	-112.95855	41.45015	7/14/2018			X		X										X						X				
DU9-SU7	-112.95855	41.44352	7/14/2018			X	X											X						X				
DU9-SU7	-112.95855	41.43690	7/14/2018			X			X									X						X				
DU9-SU7	-112.95855	41.43027	7/14/2018			X			X									X						X				
DU9-SU7	-112.95855	41.42365	7/14/2018			X		X										X						X				
DU9-SU7	-112.94956	41.43027	7/14/2018			X		X										X						X				
DU9-SU7	-112.94956	41.42365	7/14/2018			X		X										X						X				
DU9-SU7	-112.94956	41.41702	7/14/2018			X		X										X						X				

Sample ID	Longitude	Latitude	Date	V	SV	NV	TC	MC	SC	NC	ETC	EMC	ESC	VF	COL	COM	COS	SA	B	SND	BM	EBM	BH	HAL	GYP	HEX	CIR	MR
DU9-DU8	-113.08444	41.51639	7/3/2018			X			X								X	X										
DU9-DU8	-113.07545	41.51639	7/3/2018			X			X									X										X
DU9-DU8	-113.07545	41.50977	7/3/2018			X			X								X	X										
DU9-DU8	-113.07545	41.50314	7/3/2018			X			X					X		X	X	X										
DU9-DU8	-113.06646	41.51639	7/3/2018			X			X								X	X										X
DU9-DU8	-113.06646	41.50977	7/3/2018			X			X								X	X										
DU9-DU8	-113.06646	41.50314	7/3/2018			X			X								X	X										
DU9-DU8	-113.06646	41.49652	7/3/2018			X			X								X	X										
DU9-DU8	-113.06646	41.48989	7/3/2018			X			X								X	X										
DU9-DU8	-113.06646	41.48327	7/3/2018			X			X								X	X										
DU9-DU8	-113.05747	41.51639	7/3/2018			X			X								X	X										
DU9-DU8	-113.05747	41.50977	7/3/2018			X			X								X	X										
DU9-DU8	-113.05747	41.50314	7/3/2018			X			X								X	X										
DU9-DU8	-113.05747	41.49652	7/3/2018			X			X								X	X										
DU9-DU8	-113.05747	41.48989	7/3/2018			X			X								X	X										
DU9-DU8	-113.05747	41.48327	7/3/2018			X			X									X										
DU9-DU8	-113.05747	41.47664	7/3/2018			X			X								X	X										X
DU9-DU8	-113.05747	41.47002	7/3/2018			X			X								X	X										
DU9-DU8	-113.05747	41.46339	7/3/2018			X			X								X	X										
DU9-DU8	-113.04848	41.51639	7/3/2018			X			X								X	X										
DU9-DU8	-113.04848	41.50977	7/3/2018			X			X									X										
DU9-DU8	-113.04848	41.50314	7/3/2018			X			X									X										
DU9-DU8	-113.04848	41.49652	7/3/2018			X			X								X	X										
DU9-DU8	-113.04848	41.48989	7/3/2018			X			X								X	X										
DU9-DU8	-113.04848	41.48327	7/3/2018			X			X								X	X										
DU9-DU8	-113.04848	41.47664	7/3/2018			X			X								X	X										
DU9-DU8	-113.04848	41.47002	7/3/2018			X			X								X	X										
DU9-DU8	-113.04848	41.46339	7/3/2018			X			X								X	X										
DU9-DU8	-113.04848	41.45677	7/3/2018			X			X								X	X										
DU9-DU8	-113.03949	41.51639	7/3/2018			X			X								X	X										
DU9-DU8	-113.03949	41.50977	7/3/2018			X			X									X										
DU9-DU8	-113.03949	41.50314	7/3/2018			X			X									X				X						
DU9-DU8	-113.03949	41.49652	7/3/2018			X			X								X	X										
DU9-DU8	-113.03949	41.48989	7/3/2018			X			X								X	X										
DU9-DU8	-113.03949	41.48327	7/3/2018			X			X								X	X										
DU9-DU8	-113.03949	41.47664	7/3/2018			X			X								X	X										
DU9-DU8	-113.03949	41.47002	7/3/2018			X			X								X	X										
DU9-DU8	-113.03949	41.46339	7/3/2018			X			X								X	X										
DU9-DU8	-113.03949	41.45677	7/3/2018			X			X								X	X										
DU9-DU8	-113.03949	41.45014	7/3/2018			X			X								X	X									X	
DU9-DU8	-113.03949	41.44352	7/3/2018			X			X								X	X									X	
DU9-DU8	-113.03949	41.43689	7/3/2018			X			X								X	X										
DU9-DU8	-113.03949	41.43027	7/3/2018			X			X								X	X										
DU9-DU8	-113.03050	41.51639	7/3/2018			X			X								X	X										
DU9-DU8	-113.03050	41.50977	7/3/2018			X			X									X										
DU9-DU8	-113.03050	41.50314	7/3/2018			X			X									X				X						
DU9-DU8	-113.03050	41.49652	7/3/2018			X			X								X	X										
DU9-DU8	-113.03050	41.48989	7/3/2018			X			X								X	X										
DU9-DU8	-113.03050	41.48327	7/3/2018			X			X								X	X										
DU9-DU8	-113.03050	41.47664	7/3/2018			X			X								X	X										
DU9-DU8	-113.03050	41.47002	7/3/2018			X			X								X	X										
DU9-DU8	-113.03050	41.46339	7/3/2018			X			X								X	X										
DU9-DU8	-113.03050	41.45677	7/3/2018			X			X								X	X										
DU9-DU8	-113.03050	41.45014	7/3/2018			X			X								X	X									X	
DU9-DU8	-113.03050	41.44352	7/3/2018			X			X								X	X									X	
DU9-DU8	-113.03050	41.43689	7/3/2018			X			X								X	X							X		X	
DU9-DU8	-113.03050	41.43027	7/3/2018			X			X								X	X							X		X	
DU9-DU8	-113.03050	41.42364	7/3/2018			X			X								X	X										

Sample ID	Longitude	Latitude	Date	V	SV	NV	TC	MC	SC	NC	ETC	EMC	ESC	VF	COL	COM	COS	SA	B	SND	BM	EBM	BH	HAL	GYP	HEX	CIR	MR
DU9-SU9	-112.96754	41.54951	7/14/2018			X			X									X										
DU9-SU9	-112.96754	41.54289	7/14/2018			X							X				X	X										
DU9-SU9	-112.96754	41.53626	7/14/2018			X			X								X	X										
DU9-SU9	-112.96754	41.52964	7/14/2018			X			X								X	X										
DU9-SU9	-112.96754	41.52301	7/14/2018			X			X								X	X										
DU9-SU9	-112.96754	41.51639	7/14/2018			X			X								X	X										
DU9-SU9	-112.96754	41.50976	7/14/2018			X			X								X	X										
DU9-SU9	-112.96754	41.50314	7/14/2018			X		X									X	X										
DU9-SU9	-112.96754	41.49651	7/14/2018			X	X										X	X										
DU9-SU9	-112.96754	41.48989	7/14/2018			X		X									X	X										
DU9-SU9	-112.95855	41.54951	7/14/2018			X		X									X											
DU9-SU9	-112.95855	41.54289	7/14/2018			X			X								X	X										
DU9-SU9	-112.95855	41.53626	7/14/2018			X			X								X	X										
DU9-SU9	-112.95855	41.52964	7/14/2018			X		X										X						X				
DU9-SU9	-112.95855	41.52301	7/14/2018			X			X								X	X										
DU9-SU9	-112.95855	41.51639	7/14/2018			X			X								X	X										
DU9-SU9	-112.95855	41.50976	7/14/2018			X			X								X	X										
DU9-SU9	-112.95855	41.50314	7/14/2018			X			X								X	X										
DU9-SU9	-112.95855	41.49651	7/14/2018			X		X									X	X										
DU9-SU9	-112.95855	41.48989	7/14/2018			X		X									X	X										
DU9-SU9	-112.94956	41.54951	7/14/2018			X		X										X						X				
DU9-SU9	-112.94956	41.54289	7/14/2018			X	X											X						X				
DU9-SU9	-112.94956	41.53626	7/14/2018			X	X											X						X				
DU9-SU9	-112.94057	41.54951	7/14/2018			X		X										X						X				

Sample ID	Longitude	Latitude	Date	V	SV	NV	TC	MC	SC	NC	ETC	EMC	ESC	VF	COL	COM	COS	SA	B	SND	BM	EBM	BH	HAL	GYP	HEX	CIR	MR
DU9-SU10	-113.02149	41.54951	7/6/2018			X							X	X			X	X										
DU9-SU10	-113.02149	41.54289	7/6/2018			X			X								X	X										
DU9-SU10	-113.02149	41.53626	7/6/2018			X			X								X	X										
DU9-SU10	-113.02149	41.52964	7/6/2018			X							X	X			X	X										
DU9-SU10	-113.02149	41.52301	7/6/2018			X			X									X										
DU9-SU10	-113.02149	41.51639	7/6/2018			X			X								X	X										
DU9-SU10	-113.02149	41.50976	7/6/2018			X			X									X										
DU9-SU10	-113.02149	41.50314	7/6/2018			X			X									X						X				
DU9-SU10	-113.02149	41.49651	7/6/2018			X			X									X										
DU9-SU10	-113.02149	41.48989	7/6/2018			X			X									X										
DU9-SU10	-113.01250	41.54951	7/6/2018		X								X	X			X	X										
DU9-SU10	-113.01250	41.54289	7/6/2018			X			X								X	X										
DU9-SU10	-113.01250	41.53626	7/6/2018			X			X								X	X										
DU9-SU10	-113.01250	41.52964	7/6/2018			X			X								X	X										
DU9-SU10	-113.01250	41.52301	7/6/2018			X			X								X	X										
DU9-SU10	-113.01250	41.51639	7/6/2018			X			X									X										
DU9-SU10	-113.01250	41.50976	7/6/2018			X			X								X											
DU9-SU10	-113.01250	41.50314	7/6/2018			X			X								X											
DU9-SU10	-113.01250	41.49651	7/6/2018			X			X								X											
DU9-SU10	-113.01250	41.48989	7/6/2018			X			X								X											
DU9-SU10	-113.00351	41.54951	7/6/2018			X				X				X			X	X										
DU9-SU10	-113.00351	41.54289	7/6/2018			X			X								X	X										
DU9-SU10	-113.00351	41.53626	7/6/2018			X			X								X	X										
DU9-SU10	-113.00351	41.52964	7/6/2018			X		X									X	X										
DU9-SU10	-113.00351	41.52301	7/6/2018			X			X								X	X										
DU9-SU10	-113.00351	41.51639	7/6/2018			X			X									X										
DU9-SU10	-113.00351	41.50976	7/6/2018			X			X								X											
DU9-SU10	-113.00351	41.50314	7/6/2018			X		X									X											
DU9-SU10	-113.00351	41.49651	7/6/2018			X		X									X											
DU9-SU10	-113.00351	41.48989	7/6/2018			X			X								X											
DU9-SU10	-112.99452	41.54951	7/6/2018			X			X									X										
DU9-SU10	-112.99452	41.54289	7/6/2018			X			X								X	X										
DU9-SU10	-112.99452	41.53626	7/6/2018			X			X								X	X										
DU9-SU10	-112.99452	41.52964	7/6/2018			X							X	X			X	X										
DU9-SU10	-112.99452	41.52301	7/6/2018			X							X	X			X	X										
DU9-SU10	-112.99452	41.51639	7/6/2018			X			X								X	X										
DU9-SU10	-112.99452	41.50976	7/6/2018			X			X								X	X										
DU9-SU10	-112.99452	41.50314	7/6/2018			X			X								X											
DU9-SU10	-112.99452	41.49651	7/6/2018			X			X								X											
DU9-SU10	-112.99452	41.48989	7/6/2018			X		X									X											
DU9-SU10	-112.98553	41.54951	7/6/2018			X			X								X	X										
DU9-SU10	-112.98553	41.54289	7/6/2018			X			X								X	X										
DU9-SU10	-112.98553	41.53626	7/6/2018			X			X								X	X	X									
DU9-SU10	-112.98553	41.52964	7/6/2018			X			X								X	X										
DU9-SU10	-112.98553	41.52301	7/6/2018			X			X								X	X										
DU9-SU10	-112.98553	41.51639	7/6/2018			X							X	X			X	X										
DU9-SU10	-112.98553	41.50976	7/6/2018			X			X								X	X										
DU9-SU10	-112.98553	41.50314	7/6/2018			X			X								X	X	X									
DU9-SU10	-112.98553	41.49651	7/6/2018			X			X								X	X	X									
DU9-SU10	-112.98553	41.48989	7/6/2018			X			X								X	X										
DU9-SU10	-112.97654	41.54951	7/6/2018			X			X									X										
DU9-SU10	-112.97654	41.54289	7/6/2018			X			X									X										
DU9-SU10	-112.97654	41.53626	7/6/2018			X			X								X	X										
DU9-SU10	-112.97654	41.52964	7/6/2018			X			X								X	X										
DU9-SU10	-112.97654	41.52301	7/6/2018			X			X								X	X										
DU9-SU10	-112.97654	41.51639	7/6/2018			X			X								X	X										
DU9-SU10	-112.97654	41.50976	7/6/2018			X			X								X	X										
DU9-SU10	-112.97654	41.50314	7/6/2018			X			X								X	X										
DU9-SU10	-112.97654	41.49651	7/6/2018			X		X									X	X										
DU9-SU10	-112.97654	41.48989	7/6/2018			X		X								X	X	X										

Sample ID	Longitude	Latitude	Date	V	SV	NV	TC	MC	SC	NC	ETC	EMC	ESC	VF	COL	COM	COS	SA	B	SND	BM	EBM	BH	HAL	GYP	HEX	CIR	MR
DU9-SU11	-113.10242	41.54951	7/6/2018			X			X									X										
DU9-SU11	-113.09343	41.54951	7/6/2018			X			X									X										
DU9-SU11	-113.09343	41.54289	7/6/2018			X			X									X										
DU9-SU11	-113.09343	41.53626	7/6/2018			X			X									X										
DU9-SU11	-113.09343	41.52964	7/6/2018			X			X								X	X										
DU9-SU11	-113.08444	41.54951	7/6/2018			X			X									X										
DU9-SU11	-113.08444	41.54289	7/6/2018			X			X									X										
DU9-SU11	-113.08444	41.53626	7/6/2018			X			X									X										
DU9-SU11	-113.08444	41.52964	7/6/2018			X			X									X										
DU9-SU11	-113.08444	41.52301	7/6/2018			X			X								X	X										
DU9-SU11	-113.07545	41.54951	7/6/2018			X			X									X										
DU9-SU11	-113.07545	41.54289	7/6/2018			X			X									X										
DU9-SU11	-113.07545	41.53626	7/6/2018			X			X								X	X										
DU9-SU11	-113.07545	41.52964	7/6/2018			X			X								X	X										
DU9-SU11	-113.07545	41.52301	7/6/2018			X			X								X	X										
DU9-SU11	-113.06646	41.54951	7/6/2018			X			X									X										
DU9-SU11	-113.06646	41.54289	7/6/2018			X			X									X										
DU9-SU11	-113.06646	41.53626	7/6/2018			X			X								X	X										
DU9-SU11	-113.06646	41.52964	7/6/2018			X			X								X	X										
DU9-SU11	-113.06646	41.52301	7/6/2018			X			X								X	X										
DU9-SU11	-113.05747	41.54951	7/6/2018			X			X								X	X										
DU9-SU11	-113.05747	41.54289	7/6/2018			X			X								X	X										
DU9-SU11	-113.05747	41.53626	7/6/2018			X			X								X	X										
DU9-SU11	-113.05747	41.52964	7/6/2018			X			X								X	X										
DU9-SU11	-113.05747	41.52301	7/6/2018			X			X								X	X										
DU9-SU11	-113.04848	41.54951	7/6/2018			X			X								X	X										
DU9-SU11	-113.04848	41.54289	7/6/2018			X			X								X	X										
DU9-SU11	-113.04848	41.53626	7/6/2018			X			X								X	X										
DU9-SU11	-113.04848	41.52964	7/6/2018			X			X								X	X										
DU9-SU11	-113.04848	41.52301	7/6/2018			X			X								X	X										
DU9-SU11	-113.03949	41.54951	7/6/2018			X			X								X	X										
DU9-SU11	-113.03949	41.54289	7/6/2018			X			X								X	X										
DU9-SU11	-113.03949	41.53626	7/6/2018			X			X								X	X										
DU9-SU11	-113.03949	41.52964	7/6/2018			X			X								X	X										
DU9-SU11	-113.03949	41.52301	7/6/2018			X			X								X	X										
DU9-SU11	-113.03050	41.54951	7/6/2018			X			X									X										
DU9-SU11	-113.03050	41.54289	7/6/2018			X			X								X	X										
DU9-SU11	-113.03050	41.53626	7/6/2018			X			X								X	X										
DU9-SU11	-113.03050	41.52964	7/6/2018			X			X								X	X										
DU9-SU11	-113.03050	41.52301	7/6/2018			X			X								X	X										

Sample ID	Longitude	Latitude	Date	V	SV	NV	TC	MC	SC	NC	ETC	EMC	ESC	VF	COL	COM	COS	SA	B	SND	BM	EBM	BH	HAL	GYP	HEX	CIR	MR
DU9-SU12	-112.96754	41.58926	7/10/2018			X			X								X	X										
DU9-SU12	-112.96754	41.58264	7/10/2018			X			X									X	X									
DU9-SU12	-112.96754	41.57601	7/10/2018			X			X									X	X									
DU9-SU12	-112.96754	41.56939	7/10/2018			X			X								X	X										
DU9-SU12	-112.96754	41.56276	7/10/2018			X			X									X	X									
DU9-SU12	-112.96754	41.55614	7/10/2018			X			X									X	X									
DU9-SU12	-112.95855	41.58926	7/10/2018			X			X								X	X										
DU9-SU12	-112.95855	41.58264	7/10/2018			X			X								X	X										
DU9-SU12	-112.95855	41.57601	7/10/2018			X			X								X	X										
DU9-SU12	-112.95855	41.56939	7/10/2018			X			X								X	X										
DU9-SU12	-112.95855	41.56276	7/10/2018			X			X								X	X										
DU9-SU12	-112.95855	41.55614	7/10/2018			X			X								X	X										
DU9-SU12	-112.94956	41.58926	7/10/2018			X			X									X										
DU9-SU12	-112.94956	41.58264	7/10/2018			X			X									X										
DU9-SU12	-112.94956	41.57601	7/10/2018			X			X									X						X				
DU9-SU12	-112.94956	41.56939	7/10/2018			X			X									X						X				
DU9-SU12	-112.94956	41.56276	7/10/2018			X			X								X	X										
DU9-SU12	-112.94956	41.55614	7/10/2018			X			X									X						X				
DU9-SU12	-112.94057	41.58926	7/10/2018			X			X								X	X										
DU9-SU12	-112.94057	41.58264	7/10/2018			X			X								X	X										
DU9-SU12	-112.94057	41.57601	7/10/2018			X			X								X	X										
DU9-SU12	-112.94057	41.56939	7/10/2018			X			X								X	X										
DU9-SU12	-112.94057	41.56276	7/10/2018			X			X									X						X				
DU9-SU12	-112.94057	41.55614	7/10/2018			X			X									X						X				
DU9-SU12	-112.93158	41.58926	7/10/2018			X			X									X						X				
DU9-SU12	-112.93158	41.58264	7/10/2018			X			X									X						X				
DU9-SU12	-112.92259	41.58926	7/10/2018			X			X									X						X				

Sample ID	Longitude	Latitude	Date	V	SV	NV	TC	MC	SC	NC	ETC	EMC	ESC	VF	COL	COM	COS	SA	B	SND	BM	EBM	BH	HAL	GYP	HEX	CIR	MR
DU9-SU13	-113.02149	41.62900	7/18/2018			X			X									X										
DU9-SU13	-113.02149	41.62238	7/18/2018			X			X									X										
DU9-SU13	-113.02149	41.61575	7/18/2018			X			X								X	X										
DU9-SU13	-113.02149	41.60913	7/18/2018			X			X								X	X										
DU9-SU13	-113.02149	41.60250	7/18/2018			X			X									X										
DU9-SU13	-113.02149	41.59588	7/18/2018			X			X									X										
DU9-SU13	-113.02149	41.58925	7/18/2018			X			X									X										
DU9-SU13	-113.02149	41.58263	7/18/2018			X			X									X										
DU9-SU13	-113.02149	41.57600	7/18/2018			X			X									X										
DU9-SU13	-113.02149	41.56938	7/18/2018			X			X									X										
DU9-SU13	-113.02149	41.56275	7/18/2018			X			X									X										
DU9-SU13	-113.01250	41.62900	7/18/2018			X			X									X										
DU9-SU13	-113.01250	41.62238	7/18/2018			X			X									X										
DU9-SU13	-113.01250	41.61575	7/18/2018			X			X									X										
DU9-SU13	-113.01250	41.60913	7/18/2018			X			X									X										
DU9-SU13	-113.01250	41.60250	7/18/2018			X			X									X	X									
DU9-SU13	-113.01250	41.59588	7/18/2018			X			X									X										
DU9-SU13	-113.01250	41.58925	7/18/2018			X			X									X										
DU9-SU13	-113.01250	41.58263	7/18/2018			X			X								X	X										
DU9-SU13	-113.01250	41.57600	7/18/2018			X		X									X	X										
DU9-SU13	-113.01250	41.56938	7/18/2018			X			X									X										
DU9-SU13	-113.01250	41.56275	7/18/2018			X			X									X										
DU9-SU13	-113.00351	41.62900	7/18/2018			X			X									X										
DU9-SU13	-113.00351	41.62238	7/18/2018			X			X									X										
DU9-SU13	-113.00351	41.61575	7/18/2018			X			X									X										
DU9-SU13	-113.00351	41.60913	7/18/2018			X			X									X										
DU9-SU13	-113.00351	41.60250	7/18/2018			X			X									X										
DU9-SU13	-113.00351	41.59588	7/18/2018			X			X									X										
DU9-SU13	-113.00351	41.58925	7/18/2018			X			X									X										
DU9-SU13	-113.00351	41.58263	7/18/2018			X			X								X	X										
DU9-SU13	-113.00351	41.57600	7/18/2018			X			X								X	X										
DU9-SU13	-113.00351	41.56938	7/18/2018			X			X									X										
DU9-SU13	-113.00351	41.56275	7/18/2018			X			X									X										
DU9-SU13	-112.99452	41.62900	7/18/2018			X			X									X										
DU9-SU13	-112.99452	41.62238	7/18/2018			X			X									X										
DU9-SU13	-112.99452	41.61575	7/18/2018			X			X									X										
DU9-SU13	-112.99452	41.60913	7/18/2018			X			X								X	X										
DU9-SU13	-112.99452	41.60250	7/18/2018			X		X									X	X										
DU9-SU13	-112.99452	41.59588	7/18/2018			X			X								X	X										
DU9-SU13	-112.99452	41.58925	7/18/2018			X			X									X										
DU9-SU13	-112.99452	41.58263	7/18/2018			X			X									X	X									
DU9-SU13	-112.99452	41.57600	7/18/2018			X			X									X										
DU9-SU13	-112.99452	41.56938	7/18/2018			X			X									X										
DU9-SU13	-112.99452	41.56275	7/18/2018			X			X							X	X	X										
DU9-SU13	-112.98553	41.62900	7/18/2018			X			X									X										
DU9-SU13	-112.98553	41.62238	7/18/2018			X			X									X										
DU9-SU13	-112.98553	41.61575	7/18/2018			X			X									X										
DU9-SU13	-112.98553	41.60913	7/18/2018			X			X								X	X										
DU9-SU13	-112.98553	41.60250	7/18/2018			X			X								X	X										
DU9-SU13	-112.98553	41.59588	7/18/2018			X			X								X	X										
DU9-SU13	-112.98553	41.58925	7/18/2018			X			X									X										
DU9-SU13	-112.98553	41.58263	7/18/2018			X			X									X										
DU9-SU13	-112.98553	41.57600	7/18/2018			X			X									X										
DU9-SU13	-112.98553	41.56938	7/18/2018			X			X									X										
DU9-SU13	-112.98553	41.56275	7/18/2018			X			X									X	X									
DU9-SU13	-112.97654	41.62900	7/18/2018			X			X									X										
DU9-SU13	-112.97654	41.62238	7/18/2018			X			X								X	X										
DU9-SU13	-112.97654	41.61575	7/18/2018			X			X								X	X										
DU9-SU13	-112.97654	41.60913	7/18/2018			X			X								X	X										
DU9-SU13	-112.97654	41.60250	7/18/2018			X			X							X	X	X										
DU9-SU13	-112.97654	41.59588	7/18/2018			X			X								X	X										
DU9-SU13	-112.97654	41.58925	7/18/2018			X			X									X										
DU9-SU13	-112.97654	41.58263	7/18/2018			X							X	X			X	X										
DU9-SU13	-112.97654	41.57600	7/18/2018			X			X									X										
DU9-SU13	-112.97654	41.56938	7/18/2018			X			X								X	X										
DU9-SU13	-112.97654	41.56275	7/18/2018			X			X									X	X									

Sample ID	Longitude	Latitude	Date	V	SV	NV	TC	MC	SC	NC	ETC	EMC	ESC	VF	COL	COM	COS	SA	B	SND	BM	EBM	BH	HAL	GYP	HEX	CIR	MR
DU9-SU14	-113.06645	41.62900	7/20/2018			X			X									X										
DU9-SU14	-113.06645	41.62238	7/20/2018			X			X									X										
DU9-SU14	-113.06645	41.61575	7/20/2018			X			X								X	X										
DU9-SU14	-113.06645	41.60913	7/20/2018			X			X									X										
DU9-SU14	-113.06645	41.60250	7/20/2018			X			X									X										
DU9-SU14	-113.06645	41.59588	7/20/2018	X					X																			
DU9-SU14	-113.06645	41.58925	7/20/2018			X			X									X										
DU9-SU14	-113.06645	41.58263	7/20/2018			X			X								X	X										
DU9-SU14	-113.06645	41.57600	7/20/2018			X			X								X	X										
DU9-SU14	-113.06645	41.56938	7/20/2018			X			X								X	X										
DU9-SU14	-113.06645	41.56275	7/20/2018			X			X								X	X										
DU9-SU14	-113.05746	41.62900	7/20/2018			X			X									X										
DU9-SU14	-113.05746	41.62238	7/20/2018			X			X									X										
DU9-SU14	-113.05746	41.61575	7/20/2018			X			X								X	X										
DU9-SU14	-113.05746	41.60913	7/20/2018			X			X									X										
DU9-SU14	-113.05746	41.60250	7/20/2018			X			X									X										
DU9-SU14	-113.05746	41.59588	7/20/2018			X			X								X	X										
DU9-SU14	-113.05746	41.58925	7/20/2018			X			X									X										
DU9-SU14	-113.05746	41.58263	7/20/2018			X			X									X										
DU9-SU14	-113.05746	41.57600	7/20/2018			X			X									X										
DU9-SU14	-113.05746	41.56938	7/20/2018			X			X								X	X										
DU9-SU14	-113.05746	41.56275	7/20/2018			X			X								X	X										
DU9-SU14	-113.04847	41.62900	7/20/2018			X			X									X										
DU9-SU14	-113.04847	41.62238	7/20/2018			X			X									X										
DU9-SU14	-113.04847	41.61575	7/20/2018			X			X								X	X										
DU9-SU14	-113.04847	41.60913	7/20/2018			X			X								X	X										
DU9-SU14	-113.04847	41.60250	7/20/2018			X			X									X										
DU9-SU14	-113.04847	41.59588	7/20/2018			X			X								X	X										
DU9-SU14	-113.04847	41.58925	7/20/2018			X			X									X										
DU9-SU14	-113.04847	41.58263	7/20/2018			X			X									X										
DU9-SU14	-113.04847	41.57600	7/20/2018			X			X									X										
DU9-SU14	-113.04847	41.56938	7/20/2018			X			X								X	X										
DU9-SU14	-113.04847	41.56275	7/20/2018			X			X									X										
DU9-SU14	-113.03948	41.62900	7/20/2018			X			X									X										
DU9-SU14	-113.03948	41.62238	7/20/2018			X			X								X	X										
DU9-SU14	-113.03948	41.61575	7/20/2018			X			X								X	X										
DU9-SU14	-113.03948	41.60913	7/20/2018			X			X								X	X										
DU9-SU14	-113.03948	41.60250	7/20/2018			X			X									X										
DU9-SU14	-113.03948	41.59588	7/20/2018			X			X								X	X										
DU9-SU14	-113.03948	41.58925	7/20/2018			X			X									X										
DU9-SU14	-113.03948	41.58263	7/20/2018			X			X									X										
DU9-SU14	-113.03948	41.57600	7/20/2018			X			X									X										
DU9-SU14	-113.03948	41.56938	7/20/2018			X			X								X	X										
DU9-SU14	-113.03948	41.56275	7/20/2018			X			X									X										
DU9-SU14	-113.03049	41.62900	7/20/2018			X			X								X	X										
DU9-SU14	-113.03049	41.62238	7/20/2018			X			X								X	X										
DU9-SU14	-113.03049	41.61575	7/20/2018			X			X								X	X										
DU9-SU14	-113.03049	41.60913	7/20/2018			X			X								X	X										
DU9-SU14	-113.03049	41.60250	7/20/2018			X			X									X										
DU9-SU14	-113.03049	41.59588	7/20/2018			X			X								X	X										
DU9-SU14	-113.03049	41.58925	7/20/2018			X			X									X										
DU9-SU14	-113.03049	41.58263	7/20/2018			X			X									X										
DU9-SU14	-113.03049	41.57600	7/20/2018			X			X									X										
DU9-SU14	-113.03049	41.56938	7/20/2018			X			X									X										
DU9-SU14	-113.03049	41.56275	7/20/2018			X			X									X										
DU9-SU14	-113.02150	41.62900	7/20/2018			X			X									X										
DU9-SU14	-113.02150	41.62238	7/20/2018			X			X									X										
DU9-SU14	-113.02150	41.61575	7/20/2018			X			X									X										
DU9-SU14	-113.02150	41.60913	7/20/2018			X			X									X										
DU9-SU14	-113.02150	41.60250	7/20/2018			X			X									X										
DU9-SU14	-113.02150	41.59588	7/20/2018			X			X									X										
DU9-SU14	-113.02150	41.58925	7/20/2018			X			X									X										
DU9-SU14	-113.02150	41.58263	7/20/2018			X			X									X										
DU9-SU14	-113.02150	41.57600	7/20/2018			X			X									X										
DU9-SU14	-113.02150	41.56938	7/20/2018			X			X									X										
DU9-SU14	-113.02150	41.56275	7/20/2018			X			X									X										

Sample ID	Longitude	Latitude	Date	V	SV	NV	TC	MC	SC	NC	ETC	EMC	ESC	VF	COL	COM	COS	SA	B	SND	BM	EBM	BH	HAL	GYP	HEX	CIR	MR
DU9-SU15	-113.11142	41.61576	7/20/2018		X								X	X														
DU9-SU15	-113.11142	41.62475	7/20/2018			X			X									X										
DU9-SU15	-113.11142	41.63374	7/20/2018			X						X		X				X										
DU9-SU15	-113.11142	41.64273	7/20/2018			X			X									X										
DU9-SU15	-113.10243	41.62900	7/20/2018			X							X					X										
DU9-SU15	-113.10243	41.62238	7/20/2018			X							X					X										
DU9-SU15	-113.10243	41.61575	7/20/2018			X							X					X										
DU9-SU15	-113.10243	41.60913	7/20/2018			X							X					X										
DU9-SU15	-113.10243	41.60250	7/20/2018			X			X									X										
DU9-SU15	-113.10243	41.59588	7/20/2018			X			X									X										
DU9-SU15	-113.10243	41.58925	7/20/2018			X			X									X										
DU9-SU15	-113.10243	41.58263	7/20/2018			X			X									X										
DU9-SU15	-113.10243	41.57600	7/20/2018			X			X									X										
DU9-SU15	-113.10243	41.56938	7/20/2018			X			X									X										
DU9-SU15	-113.10243	41.56275	7/20/2018			X			X									X										
DU9-SU15	-113.09344	41.62900	7/20/2018			X							X					X										
DU9-SU15	-113.09344	41.62238	7/20/2018			X							X					X										
DU9-SU15	-113.09344	41.61575	7/20/2018			X							X					X										
DU9-SU15	-113.09344	41.60913	7/20/2018			X							X					X										
DU9-SU15	-113.09344	41.60250	7/20/2018			X			X									X										
DU9-SU15	-113.09344	41.59588	7/20/2018			X							X	X														
DU9-SU15	-113.09344	41.58925	7/20/2018			X			X									X										
DU9-SU15	-113.09344	41.58263	7/20/2018			X			X									X										
DU9-SU15	-113.09344	41.57600	7/20/2018			X			X									X										
DU9-SU15	-113.09344	41.56938	7/20/2018			X			X									X										
DU9-SU15	-113.09344	41.56275	7/20/2018			X			X									X										
DU9-SU15	-113.08445	41.62900	7/20/2018			X							X					X										
DU9-SU15	-113.08445	41.62238	7/20/2018			X							X					X										
DU9-SU15	-113.08445	41.61575	7/20/2018			X							X					X										
DU9-SU15	-113.08445	41.60913	7/20/2018			X							X					X										
DU9-SU15	-113.08445	41.60250	7/20/2018			X			X									X										
DU9-SU15	-113.08445	41.59588	7/20/2018			X							X	X														
DU9-SU15	-113.08445	41.58925	7/20/2018			X			X									X										
DU9-SU15	-113.08445	41.58263	7/20/2018			X			X									X										
DU9-SU15	-113.08445	41.57600	7/20/2018			X			X									X										
DU9-SU15	-113.08445	41.56938	7/20/2018			X			X									X										
DU9-SU15	-113.08445	41.56275	7/20/2018			X			X									X										X
DU9-SU15	-113.07546	41.62900	7/20/2018			X						X						X										
DU9-SU15	-113.07546	41.62238	7/20/2018			X						X						X										
DU9-SU15	-113.07546	41.61575	7/20/2018			X						X						X										
DU9-SU15	-113.07546	41.60913	7/20/2018			X						X						X										
DU9-SU15	-113.07546	41.60250	7/20/2018			X			X									X										
DU9-SU15	-113.07546	41.59588	7/20/2018		X							X		X														
DU9-SU15	-113.07546	41.58925	7/20/2018			X			X									X										
DU9-SU15	-113.07546	41.58263	7/20/2018			X			X									X										
DU9-SU15	-113.07546	41.57600	7/20/2018			X			X									X										
DU9-SU15	-113.07546	41.56938	7/20/2018			X			X									X										
DU9-SU15	-113.07546	41.56275	7/20/2018			X			X									X										

Sample ID	Longitude	Latitude	Date	V	SV	NV	TC	MC	SC	NC	ETC	EMC	ESC	VF	COL	COM	COS	SA	B	SND	BM	EBM	BH	HAL	GYP	HEX	CIR	MR
DU9-SU16	-112.92257	41.66875	7/7/2018			X			X									X										
DU9-SU16	-112.92257	41.66213	7/7/2018			X							X	X				X										
DU9-SU16	-112.92257	41.65550	7/7/2018			X			X									X										
DU9-SU16	-112.92257	41.64888	7/7/2018			X			X									X							X			
DU9-SU16	-112.92257	41.64225	7/7/2018			X			X									X							X			
DU9-SU16	-112.92257	41.63563	7/7/2018			X			X									X										
DU9-SU16	-112.92257	41.62900	7/7/2018			X			X									X										
DU9-SU16	-112.92257	41.62238	7/7/2018			X			X									X										
DU9-SU16	-112.92257	41.61575	7/7/2018			X			X									X						X				
DU9-SU16	-112.92257	41.60913	7/7/2018			X			X									X						X				
DU9-SU16	-112.92257	41.60250	7/7/2018			X			X									X						X				
DU9-SU16	-112.92257	41.59588	7/7/2018			X			X									X						X				
DU9-SU16	-112.91358	41.66875	7/7/2018			X			X									X										
DU9-SU16	-112.91358	41.66213	7/7/2018			X			X									X										
DU9-SU16	-112.91358	41.65550	7/7/2018			X			X									X										
DU9-SU16	-112.91358	41.64888	7/7/2018			X			X									X										
DU9-SU16	-112.91358	41.64225	7/7/2018			X			X									X										
DU9-SU16	-112.91358	41.63563	7/7/2018			X			X								X	X										
DU9-SU16	-112.91358	41.62900	7/7/2018			X			X									X										
DU9-SU16	-112.91358	41.62238	7/7/2018			X			X									X						X				
DU9-SU16	-112.91358	41.61575	7/7/2018			X			X									X						X				
DU9-SU16	-112.90459	41.66875	7/7/2018			X			X									X										
DU9-SU16	-112.90459	41.66213	7/7/2018			X			X									X										
DU9-SU16	-112.90459	41.65550	7/7/2018			X			X									X										
DU9-SU16	-112.90459	41.64888	7/7/2018			X			X									X							X			
DU9-SU16	-112.90459	41.64225	7/7/2018			X			X									X	X									
DU9-SU16	-112.89560	41.67538	7/7/2018		X								X	X				X										
DU9-SU16	-112.89560	41.66875	7/7/2018			X			X									X										
DU9-SU16	-112.89560	41.66213	7/7/2018			X			X									X										
DU9-SU16	-112.89560	41.65550	7/7/2018			X			X									X										
DU9-SU16	-112.89560	41.64888	7/7/2018			X			X									X							X			
DU9-SU16	-112.88661	41.67538	7/7/2018			X			X									X										
DU9-SU16	-112.88661	41.66875	7/7/2018			X			X									X										
DU9-SU16	-112.88661	41.66213	7/7/2018			X			X									X										
DU9-SU16	-112.88661	41.65550	7/7/2018			X			X									X										
DU9-SU16	-112.88661	41.64888	7/7/2018			X						X					X	X										

Sample ID	Longitude	Latitude	Date	V	SV	NV	TC	MC	SC	NC	ETC	EMC	ESC	VF	COL	COM	COS	SA	B	SND	BM	EBM	BH	HAL	GYP	HEX	CIR	MR
DU9-SU17	-112.96754	41.65550	7/10/2018			X			X									X										
DU9-SU17	-112.96754	41.64888	7/10/2018			X			X									X										
DU9-SU17	-112.96754	41.64225	7/10/2018			X			X									X										
DU9-SU17	-112.96754	41.63563	7/10/2018			X			X									X										
DU9-SU17	-112.96754	41.62900	7/10/2018			X			X								X	X										
DU9-SU17	-112.96754	41.62238	7/10/2018			X			X								X	X										
DU9-SU17	-112.96754	41.61575	7/10/2018			X			X								X	X										
DU9-SU17	-112.96754	41.60913	7/10/2018			X			X								X	X										
DU9-SU17	-112.96754	41.60250	7/10/2018			X			X								X	X										
DU9-SU17	-112.96754	41.59588	7/10/2018			X			X								X	X										
DU9-SU17	-112.95855	41.65550	7/10/2018			X			X									X										
DU9-SU17	-112.95855	41.64888	7/10/2018			X			X									X										
DU9-SU17	-112.95855	41.64225	7/10/2018			X			X									X										
DU9-SU17	-112.95855	41.63563	7/10/2018			X			X									X										
DU9-SU17	-112.95855	41.62900	7/10/2018			X			X									X	X									
DU9-SU17	-112.95855	41.62238	7/10/2018			X			X								X	X										
DU9-SU17	-112.95855	41.61575	7/10/2018			X			X								X	X										
DU9-SU17	-112.95855	41.60913	7/10/2018			X			X								X	X										
DU9-SU17	-112.95855	41.60250	7/10/2018			X			X								X	X										
DU9-SU17	-112.95855	41.59588	7/10/2018			X			X								X	X										
DU9-SU17	-112.94956	41.65550	7/10/2018			X			X									X										
DU9-SU17	-112.94956	41.64888	7/10/2018			X			X									X										
DU9-SU17	-112.94956	41.64225	7/10/2018			X			X									X										
DU9-SU17	-112.94956	41.63563	7/10/2018			X			X									X										
DU9-SU17	-112.94956	41.62900	7/10/2018			X			X									X										
DU9-SU17	-112.94956	41.62238	7/10/2018			X			X								X	X										
DU9-SU17	-112.94956	41.61575	7/10/2018			X			X								X	X										
DU9-SU17	-112.94956	41.60913	7/10/2018			X			X								X	X	X									
DU9-SU17	-112.94956	41.60250	7/10/2018		X				X							X	X	X										
DU9-SU17	-112.94956	41.59588	7/10/2018			X			X								X	X	X									
DU9-SU17	-112.94057	41.65550	7/10/2018			X			X									X										
DU9-SU17	-112.94057	41.64888	7/10/2018			X			X									X										
DU9-SU17	-112.94057	41.64225	7/10/2018			X			X									X										
DU9-SU17	-112.94057	41.63563	7/10/2018			X			X									X										
DU9-SU17	-112.94057	41.62900	7/10/2018			X			X									X										
DU9-SU17	-112.94057	41.62238	7/10/2018			X			X									X										
DU9-SU17	-112.94057	41.61575	7/10/2018			X			X									X										
DU9-SU17	-112.94057	41.60913	7/10/2018			X			X									X										
DU9-SU17	-112.94057	41.60250	7/10/2018		X			X								X	X	X										
DU9-SU17	-112.94057	41.59588	7/10/2018			X			X									X	X									
DU9-SU17	-112.93158	41.65550	7/10/2018			X			X									X										
DU9-SU17	-112.93158	41.64888	7/10/2018			X			X									X										
DU9-SU17	-112.93158	41.64225	7/10/2018			X			X									X										
DU9-SU17	-112.93158	41.63563	7/10/2018			X			X									X										
DU9-SU17	-112.93158	41.62900	7/10/2018			X			X									X										
DU9-SU17	-112.93158	41.62238	7/10/2018			X			X									X										
DU9-SU17	-112.93158	41.61575	7/10/2018			X			X									X										
DU9-SU17	-112.93158	41.60913	7/10/2018			X			X									X										
DU9-SU17	-112.93158	41.60250	7/10/2018			X			X									X						X				
DU9-SU17	-112.93158	41.59588	7/10/2018			X			X									X						X				

Sample ID	Longitude	Latitude	Date	V	SV	NV	TC	MC	SC	NC	ETC	EMC	ESC	VF	COL	COM	COS	SA	B	SND	BM	EBM	BH	HAL	GYP	HEX	CIR	MR
DU9-SU18	-113.02149	41.69525	7/21/2018			X			X									X										
DU9-SU18	-113.02149	41.68863	7/21/2018			X			X									X										X
DU9-SU18	-113.02149	41.68200	7/21/2018			X			X									X										X
DU9-SU18	-113.02149	41.67538	7/21/2018			X			X									X										X
DU9-SU18	-113.02149	41.66875	7/21/2018			X			X								X	X										
DU9-SU18	-113.02149	41.66213	7/21/2018			X			X								X	X										
DU9-SU18	-113.02149	41.65550	7/21/2018			X							X	X			X	X										
DU9-SU18	-113.02149	41.64888	7/21/2018			X			X								X	X										
DU9-SU18	-113.02149	41.64225	7/21/2018			X			X									X										
DU9-SU18	-113.02149	41.63563	7/21/2018			X			X									X										
DU9-SU18	-113.01250	41.69525	7/21/2018			X							X	X				X										
DU9-SU18	-113.01250	41.68863	7/21/2018			X			X									X										
DU9-SU18	-113.01250	41.68200	7/21/2018			X			X									X										
DU9-SU18	-113.01250	41.67538	7/21/2018			X			X									X										
DU9-SU18	-113.01250	41.66875	7/21/2018			X			X								X	X										
DU9-SU18	-113.01250	41.66213	7/21/2018			X			X								X	X										
DU9-SU18	-113.01250	41.65550	7/21/2018			X			X								X	X										
DU9-SU18	-113.01250	41.64888	7/21/2018			X			X								X	X										
DU9-SU18	-113.01250	41.64225	7/21/2018			X							X	X				X										
DU9-SU18	-113.01250	41.63563	7/21/2018			X							X	X				X										
DU9-SU18	-113.00351	41.69525	7/21/2018			X				X				X				X										
DU9-SU18	-113.00351	41.68863	7/21/2018			X			X									X										
DU9-SU18	-113.00351	41.68200	7/21/2018			X			X									X										
DU9-SU18	-113.00351	41.67538	7/21/2018			X			X									X										
DU9-SU18	-113.00351	41.66875	7/21/2018			X			X									X										
DU9-SU18	-113.00351	41.66213	7/21/2018			X			X									X										
DU9-SU18	-113.00351	41.65550	7/21/2018			X			X									X										
DU9-SU18	-113.00351	41.64888	7/21/2018			X			X									X										
DU9-SU18	-113.00351	41.64225	7/21/2018			X			X									X										
DU9-SU18	-113.00351	41.63563	7/21/2018			X			X									X										
DU9-SU18	-112.99452	41.69525	7/21/2018			X				X				X														
DU9-SU18	-112.99452	41.68863	7/21/2018			X			X									X										
DU9-SU18	-112.99452	41.68200	7/21/2018			X			X									X										
DU9-SU18	-112.99452	41.67538	7/21/2018			X			X									X										
DU9-SU18	-112.99452	41.66875	7/21/2018			X			X									X										
DU9-SU18	-112.99452	41.66213	7/21/2018			X			X									X										X
DU9-SU18	-112.99452	41.65550	7/21/2018			X			X									X										
DU9-SU18	-112.99452	41.64888	7/21/2018			X			X									X										
DU9-SU18	-112.99452	41.64225	7/21/2018			X			X									X	X									
DU9-SU18	-112.99452	41.63563	7/21/2018			X			X									X										
DU9-SU18	-112.98553	41.69525	7/21/2018		X								X	X														
DU9-SU18	-112.98553	41.68863	7/21/2018			X							X					X										
DU9-SU18	-112.98553	41.68200	7/21/2018			X							X	X				X										
DU9-SU18	-112.98553	41.67538	7/21/2018			X							X	X				X										
DU9-SU18	-112.98553	41.66875	7/21/2018			X							X	X				X										
DU9-SU18	-112.98553	41.66213	7/21/2018			X			X									X										
DU9-SU18	-112.98553	41.65550	7/21/2018			X			X									X										
DU9-SU18	-112.98553	41.64888	7/21/2018			X			X									X										
DU9-SU18	-112.98553	41.64225	7/21/2018			X			X									X										
DU9-SU18	-112.98553	41.63563	7/21/2018			X			X									X										
DU9-SU18	-112.97654	41.69525	7/21/2018	X														X										
DU9-SU18	-112.97654	41.68863	7/21/2018			X							X	X				X										
DU9-SU18	-112.97654	41.68200	7/21/2018			X							X	X				X										
DU9-SU18	-112.97654	41.67538	7/21/2018			X							X	X				X										
DU9-SU18	-112.97654	41.66875	7/21/2018			X			X									X										
DU9-SU18	-112.97654	41.66213	7/21/2018			X			X									X										
DU9-SU18	-112.97654	41.65550	7/21/2018			X			X									X										
DU9-SU18	-112.97654	41.64888	7/21/2018			X			X									X										
DU9-SU18	-112.97654	41.64225	7/21/2018			X			X									X										
DU9-SU18	-112.97654	41.63563	7/21/2018			X			X									X										

Sample ID	Longitude	Latitude	Date	V	SV	NV	TC	MC	SC	NC	ETC	EMC	ESC	VF	COL	COM	COS	SA	B	SND	BM	EBM	BH	HAL	GYP	HEX	CIR	MR
DU9-SU19	-113.06645	41.69525	7/23/2018			X						X		X				X										
DU9-SU19	-113.06645	41.68863	7/23/2018			X						X		X				X										
DU9-SU19	-113.06645	41.68200	7/23/2018			X						X		X				X										
DU9-SU19	-113.06645	41.67538	7/23/2018			X						X		X				X										
DU9-SU19	-113.06645	41.66875	7/23/2018			X						X		X				X										
DU9-SU19	-113.06645	41.66213	7/23/2018			X			X									X										
DU9-SU19	-113.06645	41.65550	7/23/2018			X			X									X										
DU9-SU19	-113.06645	41.64888	7/23/2018			X			X									X										
DU9-SU19	-113.06645	41.64225	7/23/2018			X			X									X										
DU9-SU19	-113.06645	41.63563	7/23/2018			X			X									X										
DU9-SU19	-113.05746	41.69525	7/23/2018			X							X	X				X										
DU9-SU19	-113.05746	41.68863	7/23/2018			X							X	X				X										
DU9-SU19	-113.05746	41.68200	7/23/2018			X						X		X				X										
DU9-SU19	-113.05746	41.67538	7/23/2018			X						X		X				X										
DU9-SU19	-113.05746	41.66875	7/23/2018			X						X		X				X										
DU9-SU19	-113.05746	41.66213	7/23/2018			X			X								X	X										
DU9-SU19	-113.05746	41.65550	7/23/2018			X			X									X										
DU9-SU19	-113.05746	41.64888	7/23/2018			X			X									X										
DU9-SU19	-113.05746	41.64225	7/23/2018			X			X									X										
DU9-SU19	-113.05746	41.63563	7/23/2018			X			X									X										
DU9-SU19	-113.04847	41.69525	7/23/2018			X			X									X										
DU9-SU19	-113.04847	41.68863	7/23/2018			X			X									X										
DU9-SU19	-113.04847	41.68200	7/23/2018			X			X									X										
DU9-SU19	-113.04847	41.67538	7/23/2018			X			X									X										
DU9-SU19	-113.04847	41.66875	7/23/2018			X			X								X	X										
DU9-SU19	-113.04847	41.66213	7/23/2018			X			X								X	X										
DU9-SU19	-113.04847	41.65550	7/23/2018			X			X									X										
DU9-SU19	-113.04847	41.64888	7/23/2018			X			X									X										
DU9-SU19	-113.04847	41.64225	7/23/2018			X			X									X										
DU9-SU19	-113.04847	41.63563	7/23/2018			X			X									X										
DU9-SU19	-113.03948	41.69525	7/23/2018			X			X									X										
DU9-SU19	-113.03948	41.68863	7/23/2018			X			X									X										
DU9-SU19	-113.03948	41.68200	7/23/2018			X			X									X										
DU9-SU19	-113.03948	41.67538	7/23/2018			X			X									X										
DU9-SU19	-113.03948	41.66875	7/23/2018			X			X								X	X										
DU9-SU19	-113.03948	41.66213	7/23/2018			X			X								X	X										
DU9-SU19	-113.03948	41.65550	7/23/2018			X			X									X										
DU9-SU19	-113.03948	41.64888	7/23/2018			X			X									X										
DU9-SU19	-113.03948	41.64225	7/23/2018			X			X									X										
DU9-SU19	-113.03948	41.63563	7/23/2018			X			X									X										
DU9-SU19	-113.03049	41.69525	7/23/2018			X			X									X										
DU9-SU19	-113.03049	41.68863	7/23/2018			X			X									X										
DU9-SU19	-113.03049	41.68200	7/23/2018			X			X									X										
DU9-SU19	-113.03049	41.67538	7/23/2018			X							X	X		X	X	X										
DU9-SU19	-113.03049	41.66875	7/23/2018			X			X								X	X										
DU9-SU19	-113.03049	41.66213	7/23/2018			X			X								X	X										
DU9-SU19	-113.03049	41.65550	7/23/2018			X			X									X										
DU9-SU19	-113.03049	41.64888	7/23/2018			X			X									X										
DU9-SU19	-113.03049	41.64225	7/23/2018			X			X									X										
DU9-SU19	-113.03049	41.63563	7/23/2018			X			X									X										

Sample ID	Longitude	Latitude	Date	V	SV	NV	TC	MC	SC	NC	ETC	EMC	ESC	VF	COL	COM	COS	SA	B	SND	BM	EBM	BH	HAL	GYP	HEX	CIR	MR
DU9-SU20	-113.11142	41.69525	8/4/2018			X						X						X										
DU9-SU20	-113.11142	41.68863	8/4/2018			X			X									X										
DU9-SU20	-113.11142	41.68200	8/4/2018			X					X							X										
DU9-SU20	-113.11142	41.67538	8/4/2018			X							X					X										
DU9-SU20	-113.11142	41.66875	8/4/2018		X							X						X										
DU9-SU20	-113.11142	41.64888	8/4/2018			X			X									X										
DU9-SU20	-113.11142	41.64226	8/4/2018			X			X									X										
DU9-SU20	-113.10242	41.69525	8/4/2018			X						X						X										
DU9-SU20	-113.10242	41.68863	8/4/2018			X						X						X										
DU9-SU20	-113.10242	41.68200	8/4/2018			X					X		X					X										
DU9-SU20	-113.10242	41.67538	8/4/2018			X						X						X										
DU9-SU20	-113.10242	41.66875	8/4/2018			X			X									X										
DU9-SU20	-113.10242	41.66213	8/4/2018			X			X									X										
DU9-SU20	-113.10242	41.65550	8/4/2018			X			X									X										
DU9-SU20	-113.10242	41.64888	8/4/2018			X			X									X										
DU9-SU20	-113.10242	41.64225	8/4/2018			X			X									X										
DU9-SU20	-113.10242	41.63563	8/4/2018			X			X									X										
DU9-SU20	-113.09343	41.69525	8/4/2018			X					X							X										
DU9-SU20	-113.09343	41.68863	8/4/2018			X					X		X					X										
DU9-SU20	-113.09343	41.68200	8/4/2018			X			X									X										
DU9-SU20	-113.09343	41.67538	8/4/2018			X						X						X										
DU9-SU20	-113.09343	41.66875	8/4/2018			X						X						X										
DU9-SU20	-113.09343	41.66213	8/4/2018			X			X									X										
DU9-SU20	-113.09343	41.65550	8/4/2018			X			X									X										
DU9-SU20	-113.09343	41.64888	8/4/2018			X			X									X										
DU9-SU20	-113.09343	41.64225	8/4/2018			X			X									X										
DU9-SU20	-113.09343	41.63563	8/4/2018			X			X									X										
DU9-SU20	-113.08444	41.69525	8/4/2018			X						X						X										
DU9-SU20	-113.08444	41.68863	8/4/2018			X						X						X										
DU9-SU20	-113.08444	41.68200	8/4/2018			X					X		X					X										
DU9-SU20	-113.08444	41.67538	8/4/2018			X						X	X					X										
DU9-SU20	-113.08444	41.66875	8/4/2018			X						X						X										
DU9-SU20	-113.08444	41.66213	8/4/2018			X			X									X										
DU9-SU20	-113.08444	41.65550	8/4/2018			X			X									X										
DU9-SU20	-113.08444	41.64888	8/4/2018			X			X									X										
DU9-SU20	-113.08444	41.64225	8/4/2018			X			X									X										
DU9-SU20	-113.08444	41.63563	8/4/2018			X			X									X										
DU9-SU20	-113.07545	41.69525	8/4/2018			X							X					X										
DU9-SU20	-113.07545	41.68863	8/4/2018			X							X					X										
DU9-SU20	-113.07545	41.68200	8/4/2018			X						X						X										
DU9-SU20	-113.07545	41.67538	8/4/2018			X						X						X										
DU9-SU20	-113.07545	41.66875	8/4/2018			X						X						X										
DU9-SU20	-113.07545	41.66213	8/4/2018			X			X									X										
DU9-SU20	-113.07545	41.65550	8/4/2018			X			X									X										
DU9-SU20	-113.07545	41.64888	8/4/2018			X			X									X										
DU9-SU20	-113.07545	41.64225	8/4/2018			X			X									X										
DU9-SU20	-113.07545	41.63563	8/4/2018			X			X									X										

Sample ID	Longitude	Latitude	Date	V	SV	NV	TC	MC	SC	NC	ETC	EMC	ESC	VF	COL	COM	COS	SA	B	SND	BM	EBM	BH	HAL	GYP	HEX	CIR	MR
DU9-SU21	-113.14739	41.69525	8/5/2018		X					X				X			X	X										
DU9-SU21	-113.14739	41.68863	8/5/2018		X				X									X										
DU9-SU21	-113.14739	41.68200	8/5/2018		X				X									X										
DU9-SU21	-113.13840	41.70850	8/5/2018		X							X		X				X										
DU9-SU21	-113.13840	41.70188	8/5/2018			X						X		X				X										
DU9-SU21	-113.13840	41.69525	8/5/2018			X							X	X				X										
DU9-SU21	-113.13840	41.68863	8/5/2018			X					X		X	X				X										
DU9-SU21	-113.13840	41.68200	8/5/2018		X						X		X	X				X										
DU9-SU21	-113.13840	41.67538	8/5/2018			X			X									X										
DU9-SU21	-113.12941	41.72175	8/5/2018			X			X								X	X										
DU9-SU21	-113.12941	41.71513	8/5/2018		X						X		X	X														
DU9-SU21	-113.12941	41.70850	8/5/2018			X							X	X														
DU9-SU21	-113.12941	41.70188	8/5/2018			X						X		X				X										
DU9-SU21	-113.12941	41.69525	8/5/2018			X							X	X				X										
DU9-SU21	-113.12941	41.68863	8/5/2018			X						X		X				X										
DU9-SU21	-113.12941	41.68200	8/5/2018			X						X		X				X										
DU9-SU21	-113.12941	41.67538	8/5/2018			X			X									X										
DU9-SU21	-113.12941	41.66875	8/5/2018			X			X									X										
DU9-SU21	-113.12042	41.73500	8/5/2018		X							X		X				X										
DU9-SU21	-113.12042	41.72838	8/5/2018			X						X		X				X										
DU9-SU21	-113.12042	41.72175	8/5/2018		X							X		X														
DU9-SU21	-113.12042	41.71513	8/5/2018			X					X		X	X														
DU9-SU21	-113.12042	41.70850	8/5/2018			X					X		X	X														
DU9-SU21	-113.12042	41.70188	8/5/2018			X						X		X				X										
DU9-SU21	-113.12042	41.69525	8/5/2018			X						X		X				X										
DU9-SU21	-113.12042	41.68863	8/5/2018			X			X									X										
DU9-SU21	-113.12042	41.68200	8/5/2018			X			X									X										
DU9-SU21	-113.12042	41.67538	8/5/2018			X			X									X										X
DU9-SU21	-113.12042	41.66875	8/5/2018			X							X	X				X										

Sample ID	Longitude	Latitude	Date	V	SV	NV	TC	MC	SC	NC	ETC	EMC	ESC	VF	COL	COM	COS	SA	B	SND	BM	EBM	BH	HAL	GYP	HEX	CIR	MR
DU9-SU22	-113.11142	41.73500	8/5/2018			X			X									X										
DU9-SU22	-113.11142	41.72838	8/5/2018			X						X		X				X										
DU9-SU22	-113.11142	41.72175	8/5/2018			X						X		X				X										
DU9-SU22	-113.11142	41.71513	8/5/2018			X						X		X				X										
DU9-SU22	-113.11142	41.70850	8/5/2018			X						X		X				X										
DU9-SU22	-113.11142	41.70188	8/5/2018			X						X		X				X										
DU9-SU22	-113.10243	41.73500	8/5/2018			X						X		X														
DU9-SU22	-113.10243	41.72838	8/5/2018			X						X		X														
DU9-SU22	-113.10243	41.72175	8/5/2018		X							X		X														
DU9-SU22	-113.10243	41.71513	8/5/2018			X						X		X				X										
DU9-SU22	-113.10243	41.70850	8/5/2018			X						X		X				X										
DU9-SU22	-113.10243	41.70188	8/5/2018			X						X		X				X										
DU9-SU22	-113.09344	41.73500	8/5/2018		X			X						X														
DU9-SU22	-113.09344	41.72838	8/5/2018		X							X		X														
DU9-SU22	-113.09344	41.72175	8/5/2018			X						X		X				X										
DU9-SU22	-113.09344	41.71513	8/5/2018			X						X		X				X										
DU9-SU22	-113.09344	41.70850	8/5/2018			X					X			X				X										
DU9-SU22	-113.09344	41.70188	8/5/2018			X					X			X				X										
DU9-SU22	-113.08445	41.73500	8/5/2018			X					X			X				X										
DU9-SU22	-113.08445	41.72838	8/5/2018			X						X		X				X										
DU9-SU22	-113.08445	41.72175	8/5/2018			X						X		X				X										
DU9-SU22	-113.08445	41.71513	8/5/2018			X						X		X				X										
DU9-SU22	-113.08445	41.70850	8/5/2018			X						X		X				X										
DU9-SU22	-113.08445	41.70188	8/5/2018			X						X		X				X										
DU9-SU22	-113.07546	41.73500	8/5/2018		X								X	X														
DU9-SU22	-113.07546	41.72838	8/5/2018			X						X		X				X										
DU9-SU22	-113.07546	41.72175	8/5/2018			X						X		X				X										
DU9-SU22	-113.07546	41.71513	8/5/2018			X						X		X				X										
DU9-SU22	-113.07546	41.70850	8/5/2018			X						X		X				X										
DU9-SU22	-113.07546	41.70188	8/5/2018			X						X		X				X										
DU9-SU22	-113.06647	41.73500	8/5/2018	X								X																
DU9-SU22	-113.06647	41.72838	8/5/2018			X						X		X				X										
DU9-SU22	-113.06647	41.72175	8/5/2018			X						X		X				X										
DU9-SU22	-113.06647	41.71513	8/5/2018			X						X		X				X										
DU9-SU22	-113.06647	41.70850	8/5/2018			X						X		X				X										
DU9-SU22	-113.06647	41.70188	8/5/2018			X			X					X				X										
DU9-SU22	-113.05748	41.73500	8/5/2018			X			X									X										
DU9-SU22	-113.05748	41.72838	8/5/2018			X						X						X										
DU9-SU22	-113.05748	41.72175	8/5/2018			X						X		X				X										
DU9-SU22	-113.05748	41.71513	8/5/2018			X						X		X				X										
DU9-SU22	-113.05748	41.70850	8/5/2018			X						X		X				X										
DU9-SU22	-113.05748	41.70188	8/5/2018			X			X					X				X										
DU9-SU22	-113.04849	41.73500	8/5/2018			X			X									X										
DU9-SU22	-113.04849	41.72838	8/5/2018			X			X									X										
DU9-SU22	-113.04849	41.72175	8/5/2018			X			X									X										
DU9-SU22	-113.04849	41.71513	8/5/2018			X			X									X										
DU9-SU22	-113.04849	41.70850	8/5/2018			X			X									X										
DU9-SU22	-113.04849	41.70188	8/5/2018			X			X									X										
DU9-SU22	-113.03950	41.73500	8/5/2018			X					X		X	X														
DU9-SU22	-113.03950	41.72838	8/5/2018			X						X		X				X										
DU9-SU22	-113.03950	41.72175	8/5/2018			X							X	X				X										
DU9-SU22	-113.03950	41.71513	8/5/2018			X			X									X										
DU9-SU22	-113.03950	41.70850	8/5/2018			X			X									X										
DU9-SU22	-113.03950	41.70188	8/5/2018			X			X									X										
DU9-SU22	-113.03051	41.73500	8/5/2018			X					X		X	X														
DU9-SU22	-113.03051	41.72838	8/5/2018			X						X		X				X										
DU9-SU22	-113.03051	41.72175	8/5/2018			X							X	X				X										
DU9-SU22	-113.03051	41.71513	8/5/2018			X							X	X				X										
DU9-SU22	-113.03051	41.70850	8/5/2018			X			X									X										
DU9-SU22	-113.03051	41.70188	8/5/2018			X			X									X										

Sample ID	Longitude	Latitude	Date	V	SV	NV	TC	MC	SC	NC	ETC	EMC	ESC	VF	COL	COM	COS	SA	B	SND	BM	EBM	BH	HAL	GYP	HEX	CIR	MR
DU9-SU23	-113.02149	41.73500	7/16/2018			X					X		X	X														
DU9-SU23	-113.02149	41.72838	7/16/2018			X					X		X	X														
DU9-SU23	-113.02149	41.72175	7/16/2018		X				X					X														
DU9-SU23	-113.02149	41.71513	7/16/2018			X							X	X														
DU9-SU23	-113.02149	41.70850	7/16/2018			X							X	X														
DU9-SU23	-113.02149	41.70188	7/16/2018			X			X																			
DU9-SU23	-113.01250	41.73500	7/16/2018			X					X			X														
DU9-SU23	-113.01250	41.72838	7/16/2018			X					X			X														
DU9-SU23	-113.01250	41.72175	7/16/2018			X			X																			
DU9-SU23	-113.01250	41.71513	7/16/2018			X			X																			
DU9-SU23	-113.01250	41.70850	7/16/2018		X							X		X														
DU9-SU23	-113.01250	41.70188	7/16/2018			X			X																			
DU9-SU23	-113.00351	41.73500	7/16/2018			X					X			X														
DU9-SU23	-113.00351	41.72838	7/16/2018			X					X			X														
DU9-SU23	-113.00351	41.72175	7/16/2018			X			X																			
DU9-SU23	-113.00351	41.71513	7/16/2018			X			X																			
DU9-SU23	-113.00351	41.70850	7/16/2018			X			X																			
DU9-SU23	-113.00351	41.70188	7/16/2018			X							X	X														
DU9-SU23	-112.99452	41.73500	7/16/2018			X			X																			
DU9-SU23	-112.99452	41.72838	7/16/2018			X			X																			
DU9-SU23	-112.99452	41.72175	7/16/2018			X			X																			
DU9-SU23	-112.99452	41.71513	7/16/2018			X			X																			
DU9-SU23	-112.99452	41.70850	7/16/2018			X			X																			
DU9-SU23	-112.99452	41.70188	7/16/2018		X			X						X														
DU9-SU23	-112.98553	41.73500	7/16/2018			X						X		X														
DU9-SU23	-112.98553	41.72838	7/16/2018			X						X		X														
DU9-SU23	-112.98553	41.72175	7/16/2018			X			X																			
DU9-SU23	-112.98553	41.71513	7/16/2018			X			X																			
DU9-SU23	-112.98553	41.70850	7/16/2018			X			X																			
DU9-SU23	-112.98553	41.70188	7/16/2018			X							X	X														
DU9-SU23	-112.97654	41.73500	7/16/2018			X					X			X														
DU9-SU23	-112.97654	41.72838	7/16/2018			X					X			X														
DU9-SU23	-112.97654	41.72175	7/16/2018			X			X																			
DU9-SU23	-112.97654	41.71513	7/16/2018			X			X																			
DU9-SU23	-112.97654	41.70850	7/16/2018			X			X																			
DU9-SU23	-112.96755	41.73500	7/16/2018			X					X		X	X														
DU9-SU23	-112.96755	41.72838	7/16/2018			X						X		X														
DU9-SU23	-112.95856	41.73500	7/16/2018		X				X					X														
DU9-SU23	-112.95856	41.72838	7/16/2018			X					X			X														
DU9-SU23	-112.94957	41.73500	7/16/2018	X																								
DU9-SU23	-112.94957	41.72838	7/16/2018			X					X			X														
DU9-SU23	-112.94058	41.73500	7/16/2018			X					X		X	X														

Sample ID	Longitude	Latitude	Date	V	SV	NV	TC	MC	SC	NC	ETC	EMC	ESC	VF	COL	COM	COS	SA	B	SND	BM	EBM	BH	HAL	GYP	HEX	CIR	MR
DU10-SU1	-112.49469	41.22975	5/6/2017			X			X					X		X	X											
DU10-SU1	-112.49469	41.22526	5/6/2017			X		X							X													
DU10-SU1	-112.49469	41.21178	5/6/2017			X			X						X	X												
DU10-SU1	-112.48876	41.22526	5/6/2017			X			X									X										
DU10-SU1	-112.48876	41.20729	5/6/2017			X		X											X									
DU10-SU1	-112.48283	41.21178	5/6/2017			X			X							X			X									
DU10-SU1	-112.48283	41.20729	5/6/2017		X				X							X	X											
DU10-SU1	-112.47690	41.21178	5/6/2017			X			X								X		X									
DU10-SU1	-112.47690	41.20729	5/6/2017			X			X							X												
DU10-SU1	-112.47097	41.21178	5/6/2017	X						X										X								
DU10-SU1	-112.47097	41.20729	5/6/2017			X			X							X												
DU10-SU1	-112.46504	41.20729	5/6/2017			X			X																			
DU10-SU1	-112.45911	41.20729	5/6/2017			X			X																		X	
DU10-SU1	-112.45911	41.20504	5/6/2017			X			X									X										
DU10-SU1	-112.45318	41.20729	5/6/2017			X			X																			
DU10-SU1	-112.45318	41.20504	5/6/2017			X			X																		X	
DU10-SU1	-112.45318	41.20280	5/6/2017			X				X				X		X	X											
DU10-SU1	-112.44725	41.20504	5/6/2017			X		X										X									X	
DU10-SU1	-112.44132	41.20504	5/6/2017			X		X										X									X	
DU10-SU1	-112.43539	41.20504	5/6/2017			X			X								X											
DU10-SU1	-112.42351	41.21178	5/6/2017			X			X								X		X									
DU10-SU1	-112.41758	41.21627	5/6/2017			X			X									X	X									
DU10-SU1	-112.41758	41.21178	5/6/2017			X			X																			
DU10-SU1	-112.41165	41.22076	5/6/2017		X				X					X														
DU10-SU1	-112.41165	41.21627	5/6/2017			X			X									X										
DU10-SU1	-112.40572	41.22076	5/6/2017			X			X						X				X									

Sample ID	Longitude	Latitude	Date	V	SV	NV	TC	MC	SC	NC	ETC	EMC	ESC	VF	COL	COM	COS	SA	B	SND	BM	EBM	BH	HAL	GYP	HEX	CIR	MR
DU10-SU2	-112.51841	41.26802	5/7/2017			X		X									X							X				
DU10-SU2	-112.51841	41.26353	5/7/2017			X				X								X		X			X					
DU10-SU2	-112.51248	41.26802	5/7/2017			X			X								X		X									
DU10-SU2	-112.51248	41.26353	5/7/2017			X			X										X									
DU10-SU2	-112.51248	41.25904	5/7/2017			X			X							X		X	X									
DU10-SU2	-112.51248	41.25455	5/7/2017			X			X									X										
DU10-SU2	-112.51248	41.24556	5/7/2017			X			X								X											
DU10-SU2	-112.50655	41.26352	5/7/2017			X			X							X	X		X									
DU10-SU2	-112.50655	41.25903	5/7/2017			X			X								X	X										
DU10-SU2	-112.50655	41.25454	5/7/2017			X							X	X														
DU10-SU2	-112.50655	41.24556	5/7/2017			X			X																	X		
DU10-SU2	-112.50062	41.25903	5/7/2017		X					X				X			X											
DU10-SU2	-112.50062	41.25454	5/7/2017		X					X							X											
DU10-SU2	-112.50062	41.25005	5/7/2017			X			X									X										
DU10-SU2	-112.50062	41.24556	5/7/2017			X	X																					
DU10-SU2	-112.50062	41.24107	5/7/2017		X					X				X			X											
DU10-SU2	-112.50062	41.23658	5/7/2017			X			X								X											
DU10-SU2	-112.49469	41.24107	5/7/2017			X			X									X										
DU10-SU2	-112.49469	41.23658	5/7/2017		X					X				X			X											

Sample ID	Longitude	Latitude	Date	V	SV	NV	TC	MC	SC	NC	ETC	EMC	ESC	VF	COL	COM	COS	SA	B	SND	BM	EBM	BH	HAL	GYP	HEX	CIR	MR
DU10-SU3	-112.51841	41.29946	2/4/2018			X			X								X											
DU10-SU3	-112.51841	41.29497	2/4/2018			X			X								X	X										
DU10-SU3	-112.51841	41.28598	2/4/2018			X			X								X											
DU10-SU3	-112.51841	41.28149	2/4/2018			X			X								X											
DU10-SU3	-112.51841	41.27700	2/4/2018			X			X								X											
DU10-SU3	-112.51841	41.27251	2/4/2018			X			X								X											
DU10-SU3	-112.51248	41.33988	2/4/2018		X																							
DU10-SU3	-112.51248	41.30395	2/4/2018			X					X				X	X	X											
DU10-SU3	-112.51248	41.29946	2/4/2018			X			X								X											
DU10-SU3	-112.51248	41.29497	2/4/2018			X			X							X	X											
DU10-SU3	-112.51248	41.29048	2/4/2018			X			X							X	X											
DU10-SU3	-112.51248	41.28599	2/4/2018			X					X				X	X	X											
DU10-SU3	-112.51248	41.28150	2/4/2018			X					X				X	X	X											
DU10-SU3	-112.51248	41.27700	2/4/2018			X					X				X	X	X											
DU10-SU3	-112.51248	41.27251	2/4/2018			X					X				X	X	X											
DU10-SU3	-112.50655	41.33539	2/4/2018			X			X								X											
DU10-SU3	-112.50655	41.30844	2/4/2018			X				X																		
DU10-SU3	-112.50655	41.30395	2/4/2018		X					X						X												
DU10-SU3	-112.50062	41.33539	2/4/2018			X				X						X												
DU10-SU3	-112.50062	41.33090	2/4/2018			X				X								X										
DU10-SU3	-112.50062	41.31742	2/4/2018			X				X						X												
DU10-SU3	-112.50062	41.31293	2/4/2018			X				X									X									

Sample ID	Longitude	Latitude	Date	V	SV	NV	TC	MC	SC	NC	ETC	EMC	ESC	VF	COL	COM	COS	SA	B	SND	BM	EBM	BH	HAL	GYP	HEX	CIR	MR
DU10-SU4	-112.56587	41.41174	7/22/2017			X	X											X					X					
DU10-SU4	-112.56587	41.40725	7/22/2017			X				X						X	X											
DU10-SU4	-112.55994	41.41174	7/22/2017			X			X							X												
DU10-SU4	-112.55994	41.40725	7/22/2017			X		X									X											
DU10-SU4	-112.55994	41.40276	7/22/2017			X		X									X	X										
DU10-SU4	-112.55401	41.41174	7/22/2017			X	X										X											
DU10-SU4	-112.55401	41.40725	7/22/2017			X	X										X											
DU10-SU4	-112.55401	41.40276	7/22/2017			X	X											X										
DU10-SU4	-112.55401	41.39827	7/22/2017			X			X								X											
DU10-SU4	-112.55401	41.39378	7/22/2017			X						X					X											
DU10-SU4	-112.55401	41.38929	7/22/2017			X					X						X											
DU10-SU4	-112.54808	41.41174	7/22/2017			X			X								X											
DU10-SU4	-112.54808	41.40725	7/22/2017			X		X									X											
DU10-SU4	-112.54808	41.40276	7/22/2017			X	X									X	X											
DU10-SU4	-112.54808	41.39827	7/22/2017			X			X							X	X	X										
DU10-SU4	-112.54808	41.39378	7/22/2017			X		X									X	X										
DU10-SU4	-112.54808	41.38929	7/22/2017			X		X									X											
DU10-SU4	-112.54808	41.38479	7/22/2017			X		X									X											
DU10-SU4	-112.54808	41.38030	7/22/2017			X		X									X											
DU10-SU4	-112.54215	41.38929	7/22/2017			X			X							X	X											
DU10-SU4	-112.54215	41.38479	7/22/2017			X		X									X											
DU10-SU4	-112.54215	41.38030	7/22/2017			X		X									X											
DU10-SU4	-112.54215	41.37581	7/22/2017			X		X									X											
DU10-SU4	-112.54215	41.37132	7/22/2017			X			X								X											
DU10-SU4	-112.54215	41.36683	7/22/2017			X	X									X	X											
DU10-SU4	-112.54215	41.36234	7/22/2017			X						X						X										
DU10-SU4	-112.54215	41.35785	7/22/2017			X					X							X										
DU10-SU4	-112.53622	41.35785	7/22/2017		X				X					X														
DU10-SU4	-112.53622	41.35336	7/22/2017			X		X										X	X									
DU10-SU4	-112.52434	41.34437	7/22/2017		X			X															X					

Sample ID	Longitude	Latitude	Date	V	SV	NV	TC	MC	SC	NC	ETC	EMC	ESC	VF	COL	COM	COS	SA	B	SND	BM	EBM	BH	HAL	GYP	HEX	CIR	MR
DU10-SU5	-112.58959	41.44767	7/24/2017			X			X								X	X										
DU10-SU5	-112.58959	41.44318	7/24/2017			X			X									X	X								X	
DU10-SU5	-112.58959	41.43869	7/24/2017			X			X								X	X										
DU10-SU5	-112.58959	41.43420	7/24/2017			X					X						X	X										
DU10-SU5	-112.58959	41.42971	7/24/2017			X		X						X			X											
DU10-SU5	-112.58959	41.42522	7/24/2017			X			X								X	X										
DU10-SU5	-112.58366	41.44767	7/24/2017			X			X								X	X	X								X	
DU10-SU5	-112.58366	41.44318	7/24/2017			X			X								X										X	
DU10-SU5	-112.58366	41.43869	7/24/2017			X			X								X	X										
DU10-SU5	-112.58366	41.43420	7/24/2017			X						X					X	X										
DU10-SU5	-112.58366	41.42971	7/24/2017			X						X		X			X											
DU10-SU5	-112.58366	41.42522	7/24/2017			X			X								X	X										
DU10-SU5	-112.58366	41.42072	7/24/2017			X							X				X	X										
DU10-SU5	-112.57773	41.44767	7/24/2017			X			X								X	X									X	
DU10-SU5	-112.57773	41.44318	7/24/2017			X			X								X	X									X	
DU10-SU5	-112.57773	41.43869	7/24/2017			X			X								X	X										
DU10-SU5	-112.57773	41.43420	7/24/2017			X			X									X										
DU10-SU5	-112.57773	41.42971	7/24/2017			X			X									X										
DU10-SU5	-112.57773	41.42522	7/24/2017			X			X								X	X										
DU10-SU5	-112.57773	41.42072	7/24/2017			X							X					X										
DU10-SU5	-112.57180	41.44767	7/24/2017			X			X								X	X									X	
DU10-SU5	-112.57180	41.44318	7/24/2017			X			X								X	X										
DU10-SU5	-112.57180	41.43869	7/24/2017			X			X								X	X										
DU10-SU5	-112.57180	41.43420	7/24/2017			X			X									X										
DU10-SU5	-112.57180	41.42971	7/24/2017			X			X									X										
DU10-SU5	-112.57180	41.42522	7/24/2017			X			X									X										
DU10-SU5	-112.57180	41.42072	7/24/2017			X			X								X	X										
DU10-SU5	-112.56587	41.44767	7/24/2017			X			X								X	X										X
DU10-SU5	-112.56587	41.44318	7/24/2017			X			X								X	X										
DU10-SU5	-112.56587	41.43869	7/24/2017			X			X								X	X										
DU10-SU5	-112.56587	41.43420	7/24/2017			X			X									X										
DU10-SU5	-112.56587	41.42971	7/24/2017			X			X									X	X								X	
DU10-SU5	-112.56587	41.42522	7/24/2017			X			X									X									X	
DU10-SU5	-112.56587	41.42072	7/24/2017			X		X									X	X										
DU10-SU5	-112.56587	41.41623	7/24/2017			X			X								X	X										
DU10-SU5	-112.55994	41.44767	7/24/2017			X			X								X	X										
DU10-SU5	-112.55994	41.44318	7/24/2017			X			X								X	X										
DU10-SU5	-112.55994	41.43869	7/24/2017			X			X								X	X									X	
DU10-SU5	-112.55994	41.43420	7/24/2017			X			X									X										
DU10-SU5	-112.55994	41.42971	7/24/2017			X			X								X	X									X	
DU10-SU5	-112.55994	41.42522	7/24/2017			X			X								X	X										
DU10-SU5	-112.55994	41.42072	7/24/2017			X						X					X	X										
DU10-SU5	-112.55994	41.41623	7/24/2017			X							X				X	X										
DU10-SU5	-112.55401	41.44767	7/24/2017			X			X								X	X										
DU10-SU5	-112.55401	41.44318	7/24/2017			X			X								X	X										
DU10-SU5	-112.55401	41.43869	7/24/2017			X			X								X	X										
DU10-SU5	-112.55401	41.43420	7/24/2017			X		X									X	X										
DU10-SU5	-112.55401	41.42971	7/24/2017			X			X									X										
DU10-SU5	-112.55401	41.42522	7/24/2017			X			X									X									X	
DU10-SU5	-112.55401	41.42072	7/24/2017			X			X								X	X										
DU10-SU5	-112.55401	41.41623	7/24/2017			X			X								X	X	X								X	
DU10-SU5	-112.54808	41.43869	7/24/2017			X			X									X										
DU10-SU5	-112.54808	41.43420	7/24/2017			X			X									X										
DU10-SU5	-112.54808	41.42971	7/24/2017			X			X									X	X								X	
DU10-SU5	-112.54808	41.42522	7/24/2017			X			X									X									X	
DU10-SU5	-112.54808	41.42072	7/24/2017			X			X									X									X	
DU10-SU5	-112.54808	41.41623	7/24/2017			X			X									X	X								X	

Sample ID	Longitude	Latitude	Date	V	SV	NV	TC	MC	SC	NC	ETC	EMC	ESC	VF	COL	COM	COS	SA	B	SND	BM	EBM	BH	HAL	GYP	HEX	CIR	MR
DU10-SU6	-112.61925	41.45216	5/22/2017			X			X									X	X									
DU10-SU6	-112.61332	41.45665	5/22/2017			X			X								X	X										
DU10-SU6	-112.61332	41.45216	5/22/2017			X			X								X	X										
DU10-SU6	-112.60739	41.46564	5/22/2017			X			X								X											
DU10-SU6	-112.60739	41.46115	5/22/2017			X			X									X								X		
DU10-SU6	-112.60739	41.45666	5/22/2017			X			X									X										
DU10-SU6	-112.60739	41.45217	5/22/2017			X			X								X	X										
DU10-SU6	-112.60146	41.46564	5/22/2017			X			X									X								X		
DU10-SU6	-112.60146	41.46115	5/22/2017			X				X																X		
DU10-SU6	-112.60146	41.45666	5/22/2017			X			X																			
DU10-SU6	-112.60146	41.45217	5/22/2017			X			X								X	X										
DU10-SU6	-112.59553	41.46564	5/22/2017			X			X									X								X		
DU10-SU6	-112.59553	41.45666	5/22/2017		X				X												X							
DU10-SU6	-112.59553	41.45217	5/22/2017			X			X								X	X										
DU10-SU6	-112.58960	41.45666	5/22/2017			X							X				X									X		
DU10-SU6	-112.58960	41.45217	5/22/2017			X			X								X	X										
DU10-SU6	-112.58367	41.45666	5/22/2017			X			X									X								X		
DU10-SU6	-112.58367	41.45217	5/22/2017			X			X									X										
DU10-SU6	-112.57774	41.45217	5/22/2017			X			X									X										
DU10-SU6	-112.57181	41.45666	5/22/2017		X				X																	X		
DU10-SU6	-112.57181	41.45217	5/22/2017			X			X									X										
DU10-SU6	-112.56588	41.45666	5/22/2017			X			X																	X		
DU10-SU6	-112.56588	41.45217	5/22/2017			X			X									X										
DU10-SU6	-112.55995	41.45217	5/22/2017			X			X									X										

Sample ID	Longitude	Latitude	Date	V	SV	NV	TC	MC	SC	NC	ETC	EMC	ESC	VF	COL	COM	COS	SA	B	SND	BM	EBM	BH	HAL	GYP	HEX	CIR	MR
DU10-SU7	-112.66077	41.43420	5/22/2017			X			X									X	X									
DU10-SU7	-112.66077	41.42971	5/22/2017			X			X										X								X	
DU10-SU7	-112.66077	41.42522	5/22/2017			X			X																			
DU10-SU7	-112.65484	41.43420	5/22/2017			X			X							X			X									
DU10-SU7	-112.65484	41.42971	5/22/2017			X			X						X	X												
DU10-SU7	-112.65484	41.42522	5/22/2017			X			X						X													
DU10-SU7	-112.65484	41.42073	5/22/2017			X	X																					
DU10-SU7	-112.64891	41.43869	5/22/2017			X			X								X											
DU10-SU7	-112.64891	41.43420	5/22/2017			X			X							X	X											
DU10-SU7	-112.64891	41.42971	5/22/2017			X		X									X											
DU10-SU7	-112.64891	41.42522	5/22/2017			X			X								X											
DU10-SU7	-112.64891	41.42073	5/22/2017			X		X									X											
DU10-SU7	-112.64891	41.41624	5/22/2017			X				X							X											
DU10-SU7	-112.64298	41.43869	5/22/2017			X			X								X											
DU10-SU7	-112.64298	41.43420	5/22/2017			X			X								X	X										
DU10-SU7	-112.64298	41.42971	5/22/2017			X			X										X								X	
DU10-SU7	-112.64298	41.42522	5/22/2017			X		X									X											
DU10-SU7	-112.64298	41.42073	5/22/2017			X			X								X											
DU10-SU7	-112.64298	41.41624	5/22/2017			X			X								X											
DU10-SU7	-112.63705	41.43869	5/22/2017			X			X								X	X										
DU10-SU7	-112.63705	41.43420	5/22/2017			X		X																				
DU10-SU7	-112.63705	41.42971	5/22/2017			X			X							X												
DU10-SU7	-112.63705	41.42522	5/22/2017			X		X								X	X											
DU10-SU7	-112.63705	41.42073	5/22/2017		X					X				X		X	X											
DU10-SU7	-112.63705	41.41624	5/22/2017			X				X							X			X								
DU10-SU7	-112.63112	41.44318	5/22/2017			X			X									X	X									
DU10-SU7	-112.63112	41.43869	5/22/2017			X			X								X	X										
DU10-SU7	-112.63112	41.43420	5/22/2017			X			X								X	X										
DU10-SU7	-112.63112	41.42971	5/22/2017			X			X								X											
DU10-SU7	-112.63112	41.42522	5/22/2017			X			X								X	X										
DU10-SU7	-112.63112	41.42073	5/22/2017			X		X									X											
DU10-SU7	-112.63112	41.41624	5/22/2017			X			X								X											
DU10-SU7	-112.62519	41.44318	5/22/2017			X			X								X											
DU10-SU7	-112.62519	41.43869	5/22/2017		X					X				X			X											
DU10-SU7	-112.62519	41.43420	5/22/2017			X			X							X	X											
DU10-SU7	-112.62519	41.42971	5/22/2017			X			X								X	X										
DU10-SU7	-112.62519	41.42522	5/22/2017			X			X								X		X								X	
DU10-SU7	-112.62519	41.42073	5/22/2017			X			X								X	X										
DU10-SU7	-112.62519	41.41624	5/22/2017			X		X									X											
DU10-SU7	-112.61926	41.44767	5/22/2017			X			X								X	X										
DU10-SU7	-112.61926	41.44318	5/22/2017			X			X								X	X										
DU10-SU7	-112.61926	41.43869	5/22/2017			X			X										X									
DU10-SU7	-112.61926	41.43420	5/22/2017			X			X								X	X										
DU10-SU7	-112.61926	41.42971	5/22/2017			X			X								X	X	X									
DU10-SU7	-112.61926	41.42522	5/22/2017			X			X								X	X										
DU10-SU7	-112.61926	41.42073	5/22/2017			X			X								X											
DU10-SU7	-112.61926	41.41624	5/22/2017			X			X								X											
DU10-SU7	-112.61926	41.41175	5/22/2017			X			X								X											
DU10-SU7	-112.61333	41.44767	5/22/2017			X			X								X	X										
DU10-SU7	-112.61333	41.44318	5/22/2017			X			X								X	X										

Sample ID	Longitude	Latitude	Date	V	SV	NV	TC	MC	SC	NC	ETC	EMC	ESC	VF	COL	COM	COS	SA	B	SND	BM	EBM	BH	HAL	GYP	HEX	CIR	MR
DU10-SU7	-112.61333	41.43869	5/22/2017			X			X								X	X										
DU10-SU7	-112.61333	41.43420	5/22/2017			X			X								X											
DU10-SU7	-112.61333	41.42971	5/22/2017			X			X								X	X										
DU10-SU7	-112.61333	41.42522	5/22/2017			X			X								X	X										
DU10-SU7	-112.61333	41.42073	5/22/2017			X			X								X	X										
DU10-SU7	-112.61333	41.41624	5/22/2017			X			X								X											
DU10-SU7	-112.61333	41.41175	5/22/2017			X			X								X											
DU10-SU7	-112.60740	41.44767	5/22/2017			X			X									X										
DU10-SU7	-112.60740	41.44318	5/22/2017			X			X								X	X										
DU10-SU7	-112.60740	41.43869	5/22/2017			X			X								X	X										
DU10-SU7	-112.60740	41.43420	5/22/2017			X			X								X	X										
DU10-SU7	-112.60740	41.42971	5/22/2017			X			X								X	X										
DU10-SU7	-112.60740	41.42522	5/22/2017			X			X								X	X	X									
DU10-SU7	-112.60740	41.42073	5/22/2017			X			X								X	X										
DU10-SU7	-112.60740	41.41624	5/22/2017			X			X								X											
DU10-SU7	-112.60147	41.44767	5/22/2017			X			X									X										
DU10-SU7	-112.60147	41.44318	5/22/2017			X			X								X	X										
DU10-SU7	-112.60147	41.43869	5/22/2017			X			X								X	X										
DU10-SU7	-112.60147	41.43420	5/22/2017			X			X								X	X										
DU10-SU7	-112.60147	41.42971	5/22/2017			X		X									X	X										
DU10-SU7	-112.60147	41.42522	5/22/2017			X			X								X	X										
DU10-SU7	-112.60147	41.42073	5/22/2017			X			X								X	X										
DU10-SU7	-112.60147	41.41624	5/22/2017			X			X								X											
DU10-SU7	-112.59554	41.44767	5/22/2017			X			X								X											
DU10-SU7	-112.59554	41.44318	5/22/2017			X			X									X										
DU10-SU7	-112.59554	41.43869	5/22/2017			X			X								X	X										
DU10-SU7	-112.59554	41.43420	5/22/2017			X			X								X	X										
DU10-SU7	-112.59554	41.42971	5/22/2017			X			X								X	X										
DU10-SU7	-112.59554	41.42522	5/22/2017			X			X								X	X										
DU10-SU7	-112.59554	41.42073	5/22/2017			X			X										X									

Sample ID	Longitude	Latitude	Date	V	SV	NV	TC	MC	SC	NC	ETC	EMC	ESC	VF	COL	COM	COS	SA	B	SND	BM	EBM	BH	HAL	GYP	HEX	CIR	MR
DU10-SU8	-112.75567	41.51504	5/20/2017			X			X									X										
DU10-SU8	-112.75567	41.51055	5/20/2017			X			X										X									
DU10-SU8	-112.75567	41.50606	5/20/2017			X			X																			
DU10-SU8	-112.75567	41.50157	5/20/2017			X			X																			
DU10-SU8	-112.74974	41.51055	5/20/2017			X			X									X	X									
DU10-SU8	-112.74974	41.50606	5/20/2017			X			X																			
DU10-SU8	-112.74974	41.50157	5/20/2017			X			X								X	X										
DU10-SU8	-112.74381	41.49708	5/20/2017			X			X								X											
DU10-SU8	-112.73788	41.49259	5/20/2017			X			X							X												
DU10-SU8	-112.73788	41.48809	5/20/2017			X			X										X							X		
DU10-SU8	-112.73788	41.48360	5/20/2017			X			X										X									
DU10-SU8	-112.73195	41.48360	5/20/2017			X			X										X									
DU10-SU8	-112.73195	41.47911	5/20/2017			X			X										X									
DU10-SU8	-112.72602	41.47462	5/20/2017			X			X																			
DU10-SU8	-112.72602	41.47013	5/20/2017			X			X								X											
DU10-SU8	-112.72009	41.46564	5/20/2017			X			X									X										
DU10-SU8	-112.72009	41.46115	5/20/2017			X				X							X											
DU10-SU8	-112.72009	41.45666	5/20/2017			X				X					X												X	
DU10-SU8	-112.71416	41.46564	5/20/2017			X			X																			
DU10-SU8	-112.71416	41.46115	5/20/2017			X			X																			
DU10-SU8	-112.71416	41.45666	5/20/2017			X			X								X											
DU10-SU8	-112.70823	41.46115	5/20/2017			X			X									X										
DU10-SU8	-112.70823	41.45666	5/20/2017			X			X								X	X										
DU10-SU8	-112.70823	41.45217	5/20/2017			X				X							X											
DU10-SU8	-112.70230	41.46115	5/20/2017			X			X																			
DU10-SU8	-112.70230	41.45666	5/20/2017			X			X								X	X										
DU10-SU8	-112.70230	41.45217	5/20/2017			X		X									X											
DU10-SU8	-112.69637	41.45666	5/20/2017			X			X								X										X	
DU10-SU8	-112.69637	41.45217	5/20/2017			X			X								X											
DU10-SU8	-112.69044	41.45666	5/20/2017			X			X																			
DU10-SU8	-112.69044	41.45217	5/20/2017			X			X								X											
DU10-SU8	-112.68451	41.45217	5/20/2017			X			X																			
DU10-SU8	-112.67858	41.45217	5/20/2017			X			X									X									X	
DU10-SU8	-112.67858	41.44768	5/20/2017			X			X								X											
DU10-SU8	-112.67858	41.44318	5/20/2017			X			X								X											
DU10-SU8	-112.67264	41.44318	5/20/2017			X			X										X									
DU10-SU8	-112.66671	41.43420	5/20/2017			X				X																		

Sample ID	Longitude	Latitude	Date	V	SV	NV	TC	MC	SC	NC	ETC	EMC	ESC	VF	COL	COM	COS	SA	B	SND	BM	EBM	BH	HAL	GYP	HEX	CIR	MR
DU10-SU9	-112.80313	41.59139	7/11/2018			X			X									X						X				
DU10-SU9	-112.80313	41.58690	7/11/2018			X			X									X						X				
DU10-SU9	-112.80313	41.55995	7/11/2018			X			X									X						X				
DU10-SU9	-112.80313	41.55546	7/11/2018			X			X									X						X				
DU10-SU9	-112.80313	41.55097	7/11/2018			X			X									X	X					X				
DU10-SU9	-112.80313	41.54648	7/11/2018			X			X									X	X					X				
DU10-SU9	-112.80313	41.54199	7/11/2018			X			X									X	X					X				
DU10-SU9	-112.80313	41.53750	7/11/2018			X			X									X	X					X				
DU10-SU9	-112.79720	41.59139	7/11/2018			X			X									X						X				
DU10-SU9	-112.79720	41.58690	7/11/2018			X			X									X						X				
DU10-SU9	-112.79720	41.58241	7/11/2018			X			X									X						X				
DU10-SU9	-112.79720	41.57343	7/11/2018			X			X									X	X					X				
DU10-SU9	-112.79720	41.56894	7/11/2018			X			X									X						X				
DU10-SU9	-112.79720	41.56445	7/11/2018			X	X																					
DU10-SU9	-112.79720	41.55546	7/11/2018			X			X									X										
DU10-SU9	-112.79720	41.55097	7/11/2018			X			X									X	X									
DU10-SU9	-112.79720	41.54648	7/11/2018			X			X								X	X	X									
DU10-SU9	-112.79720	41.54199	7/11/2018			X			X								X	X	X									
DU10-SU9	-112.79720	41.53750	7/11/2018			X			X								X	X	X									
DU10-SU9	-112.79127	41.59139	7/11/2018			X			X									X						X				
DU10-SU9	-112.79127	41.57792	7/11/2018			X			X									X									X	
DU10-SU9	-112.79127	41.57343	7/11/2018			X			X									X	X						X		X	
DU10-SU9	-112.79127	41.56894	7/11/2018			X		X						X				X										
DU10-SU9	-112.79127	41.55097	7/11/2018			X		X								X	X	X										
DU10-SU9	-112.79127	41.54648	7/11/2018			X			X							X	X	X	X									
DU10-SU9	-112.79127	41.54199	7/11/2018			X			X								X	X	X									
DU10-SU9	-112.79127	41.53750	7/11/2018			X			X								X	X	X									
DU10-SU9	-112.79127	41.53301	7/11/2018			X			X									X										
DU10-SU9	-112.78534	41.59139	7/11/2018			X			X								X	X										
DU10-SU9	-112.78534	41.58690	7/11/2018			X			X								X	X										
DU10-SU9	-112.78534	41.58241	7/11/2018			X			X									X										
DU10-SU9	-112.78534	41.55097	7/11/2018			X			X									X										
DU10-SU9	-112.78534	41.54648	7/11/2018			X			X									X										
DU10-SU9	-112.78534	41.54199	7/11/2018			X			X									X										
DU10-SU9	-112.78534	41.53750	7/11/2018			X			X									X							X		X	
DU10-SU9	-112.78534	41.53301	7/11/2018			X			X									X										
DU10-SU9	-112.78534	41.52852	7/11/2018			X			X									X										
DU10-SU9	-112.78534	41.52402	7/11/2018			X			X									X						X				
DU10-SU9	-112.77941	41.59139	7/11/2018			X			X									X										
DU10-SU9	-112.77941	41.58690	7/11/2018			X						X					X											
DU10-SU9	-112.77941	41.53750	7/11/2018			X			X									X										
DU10-SU9	-112.77941	41.53301	7/11/2018			X			X									X										
DU10-SU9	-112.77941	41.52852	7/11/2018			X			X								X	X										
DU10-SU9	-112.77941	41.52403	7/11/2018			X			X									X										
DU10-SU9	-112.77941	41.51954	7/11/2018			X			X							X	X	X										
DU10-SU9	-112.77941	41.51505	7/11/2018			X			X									X						X				
DU10-SU9	-112.77348	41.59139	7/11/2018			X			X									X										
DU10-SU9	-112.77348	41.58690	7/11/2018			X			X									X										
DU10-SU9	-112.77348	41.53301	7/11/2018			X			X									X										
DU10-SU9	-112.77348	41.52852	7/11/2018			X			X									X										
DU10-SU9	-112.77348	41.52403	7/11/2018			X		X										X										
DU10-SU9	-112.77348	41.51954	7/11/2018			X			X							X	X	X										
DU10-SU9	-112.77348	41.51505	7/11/2018			X			X									X										
DU10-SU9	-112.77348	41.51056	7/11/2018			X			X									X						X				
DU10-SU9	-112.76755	41.59139	7/11/2018			X			X									X										
DU10-SU9	-112.76755	41.58690	7/11/2018			X			X									X										
DU10-SU9	-112.76755	41.52402	7/11/2018			X			X									X										
DU10-SU9	-112.76755	41.51953	7/11/2018			X			X									X										
DU10-SU9	-112.76755	41.51504	7/11/2018			X			X									X							X			
DU10-SU9	-112.76755	41.51055	7/11/2018			X			X									X										
DU10-SU9	-112.76162	41.51504	7/11/2018			X			X									X							X			
DU10-SU9	-112.76162	41.51055	7/11/2018			X			X									X										
DU10-SU9	-112.76162	41.50606	7/11/2018			X			X									X						X				

Sample ID	Longitude	Latitude	Date	V	SV	NV	TC	MC	SC	NC	ETC	EMC	ESC	VF	COL	COM	COS	SA	B	SND	BM	EBM	BH	HAL	GYP	HEX	CIR	MR
DU10-SU10	-112.80906	41.61834	7/13/2018			X				X				X		X	X	X										
DU10-SU10	-112.80313	41.61834	7/13/2018		X					X				X		X		X										
DU10-SU10	-112.80313	41.61385	7/13/2018			X			X									X						X				
DU10-SU10	-112.80313	41.60936	7/13/2018			X			X									X						X				
DU10-SU10	-112.80313	41.60487	7/13/2018			X		X									X											
DU10-SU10	-112.80313	41.60038	7/13/2018			X			X								X	X										
DU10-SU10	-112.80313	41.59589	7/13/2018			X			X									X						X				
DU10-SU10	-112.79720	41.61834	7/13/2018			X				X				X		X		X										
DU10-SU10	-112.79720	41.61385	7/13/2018			X			X									X										
DU10-SU10	-112.79720	41.60936	7/13/2018			X			X									X										
DU10-SU10	-112.79720	41.60487	7/13/2018			X		X									X	X										
DU10-SU10	-112.79720	41.60038	7/13/2018			X			X								X	X										
DU10-SU10	-112.79720	41.59589	7/13/2018			X			X									X						X				
DU10-SU10	-112.79127	41.62732	7/13/2018			X			X									X						X				
DU10-SU10	-112.79127	41.62283	7/13/2018			X			X									X						X				
DU10-SU10	-112.79127	41.61834	7/13/2018			X				X				X			X	X										
DU10-SU10	-112.79127	41.61385	7/13/2018			X			X									X										
DU10-SU10	-112.79127	41.60936	7/13/2018			X			X								X	X										
DU10-SU10	-112.79127	41.60487	7/13/2018			X			X								X	X										
DU10-SU10	-112.79127	41.60037	7/13/2018		X								X	X			X	X							X		X	
DU10-SU10	-112.79127	41.59588	7/13/2018			X			X									X						X				
DU10-SU10	-112.78534	41.62732	7/13/2018			X			X									X						X				
DU10-SU10	-112.78534	41.62283	7/13/2018			X			X							X		X										
DU10-SU10	-112.78534	41.61834	7/13/2018		X					X				X			X	X										
DU10-SU10	-112.78534	41.61385	7/13/2018			X			X									X										
DU10-SU10	-112.78534	41.60936	7/13/2018			X			X									X										
DU10-SU10	-112.78534	41.60487	7/13/2018			X			X								X	X							X		X	
DU10-SU10	-112.78534	41.60037	7/13/2018			X			X								X											
DU10-SU10	-112.78534	41.59588	7/13/2018			X			X								X	X										
DU10-SU10	-112.77941	41.62732	7/13/2018			X			X								X	X										
DU10-SU10	-112.77941	41.62283	7/13/2018		X					X				X			X											
DU10-SU10	-112.77941	41.61834	7/13/2018		X					X				X			X											
DU10-SU10	-112.77941	41.61385	7/13/2018			X			X									X										
DU10-SU10	-112.77941	41.60936	7/13/2018			X			X									X										
DU10-SU10	-112.77941	41.60487	7/13/2018			X			X								X	X										
DU10-SU10	-112.77941	41.60037	7/13/2018			X			X								X	X										
DU10-SU10	-112.77941	41.59588	7/13/2018			X			X									X										
DU10-SU10	-112.77348	41.62732	7/13/2018			X			X							X	X	X										
DU10-SU10	-112.77348	41.62283	7/13/2018			X			X								X	X										
DU10-SU10	-112.77348	41.61834	7/13/2018		X					X				X			X											
DU10-SU10	-112.77348	41.61385	7/13/2018			X			X									X										
DU10-SU10	-112.77348	41.60936	7/13/2018			X			X								X	X										
DU10-SU10	-112.77348	41.60487	7/13/2018			X			X									X										
DU10-SU10	-112.77348	41.60037	7/13/2018			X			X								X	X										
DU10-SU10	-112.77348	41.59588	7/13/2018			X			X									X										
DU10-SU10	-112.76755	41.62732	7/13/2018			X			X									X										
DU10-SU10	-112.76755	41.62283	7/13/2018			X		X									X											
DU10-SU10	-112.76755	41.61834	7/13/2018			X			X									X										
DU10-SU10	-112.76755	41.61385	7/13/2018			X			X									X										
DU10-SU10	-112.76755	41.60936	7/13/2018			X			X									X										

Sample ID	Longitude	Latitude	Date	V	SV	NV	TC	MC	SC	NC	ETC	EMC	ESC	VF	COL	COM	COS	SA	B	SND	BM	EBM	BH	HAL	GYP	HEX	CIR	MR
DU10-SU10	-112.76755	41.60487	7/13/2018			X			X									X										
DU10-SU10	-112.76755	41.60037	7/13/2018			X			X									X										
DU10-SU10	-112.76755	41.59588	7/13/2018			X			X									X										
DU10-SU10	-112.76162	41.62732	7/13/2018			X			X									X										
DU10-SU10	-112.76162	41.62283	7/13/2018			X		X									X											
DU10-SU10	-112.76162	41.61834	7/13/2018			X			X									X										
DU10-SU10	-112.76162	41.61385	7/13/2018			X			X									X										
DU10-SU10	-112.76162	41.60936	7/13/2018			X			X									X										
DU10-SU10	-112.76162	41.60487	7/13/2018			X			X									X										
DU10-SU10	-112.76162	41.60037	7/13/2018			X			X									X										
DU10-SU10	-112.76162	41.59588	7/13/2018			X			X									X										
DU10-SU10	-112.75569	41.62732	7/13/2018			X			X									X										
DU10-SU10	-112.75569	41.62283	7/13/2018			X			X									X										
DU10-SU10	-112.75569	41.61834	7/13/2018			X			X									X										
DU10-SU10	-112.75569	41.61385	7/13/2018			X			X									X										
DU10-SU10	-112.75569	41.60936	7/13/2018			X			X									X										
DU10-SU10	-112.75569	41.60487	7/13/2018			X			X									X										
DU10-SU10	-112.75569	41.60037	7/13/2018			X			X									X										
DU10-SU10	-112.74976	41.62732	7/13/2018			X			X									X										
DU10-SU10	-112.74976	41.62283	7/13/2018			X			X									X										
DU10-SU10	-112.74976	41.61834	7/13/2018			X			X									X										
DU10-SU10	-112.74976	41.61385	7/13/2018			X			X									X										
DU10-SU10	-112.74976	41.60936	7/13/2018			X			X									X										
DU10-SU10	-112.74976	41.60487	7/13/2018			X			X									X										
DU10-SU10	-112.74383	41.62283	7/13/2018			X			X									X										
DU10-SU10	-112.74383	41.61834	7/13/2018			X			X									X										

Sample ID	Longitude	Latitude	Date	V	SV	NV	TC	MC	SC	NC	ETC	EMC	ESC	VF	COL	COM	COS	SA	B	SND	BM	EBM	BH	HAL	GYP	HEX	CIR	MR
DU10-SU11	-112.79126	41.63631	7/8/2018			X			X								X	X					X					
DU10-SU11	-112.79126	41.63182	7/8/2018			X			X								X	X										
DU10-SU11	-112.78533	41.63631	7/8/2018			X			X								X	X										
DU10-SU11	-112.78533	41.63182	7/8/2018			X			X							X	X	X										
DU10-SU11	-112.77940	41.66326	7/8/2018			X			X									X										
DU10-SU11	-112.77940	41.65877	7/8/2018			X			X								X	X										
DU10-SU11	-112.77940	41.65428	7/8/2018			X			X								X	X										
DU10-SU11	-112.77940	41.64979	7/8/2018			X			X								X	X										
DU10-SU11	-112.77940	41.64530	7/8/2018			X			X								X	X										
DU10-SU11	-112.77940	41.64081	7/8/2018			X			X									X						X				
DU10-SU11	-112.77940	41.63631	7/8/2018			X			X								X	X										
DU10-SU11	-112.77940	41.63182	7/8/2018			X			X									X										
DU10-SU11	-112.77347	41.66326	7/8/2018			X			X									X										
DU10-SU11	-112.77347	41.65877	7/8/2018			X			X								X	X	X									
DU10-SU11	-112.77347	41.65428	7/8/2018			X			X								X	X	X									
DU10-SU11	-112.77347	41.64979	7/8/2018			X			X								X	X										
DU10-SU11	-112.77347	41.64530	7/8/2018			X			X								X	X										
DU10-SU11	-112.77347	41.64081	7/8/2018			X			X									X	X									
DU10-SU11	-112.77347	41.63631	7/8/2018			X			X									X	X									
DU10-SU11	-112.77347	41.63182	7/8/2018			X			X									X										
DU10-SU11	-112.76754	41.66326	7/8/2018			X			X									X										
DU10-SU11	-112.76754	41.65877	7/8/2018			X			X								X	X	X									
DU10-SU11	-112.76754	41.65428	7/8/2018			X			X									X										
DU10-SU11	-112.76754	41.64979	7/8/2018			X			X									X										
DU10-SU11	-112.76754	41.64530	7/8/2018			X			X									X										
DU10-SU11	-112.76754	41.64081	7/8/2018			X			X									X	X									
DU10-SU11	-112.76754	41.63631	7/8/2018			X			X									X	X									
DU10-SU11	-112.76754	41.63182	7/8/2018			X			X									X										
DU10-SU11	-112.76161	41.66326	7/8/2018			X			X									X										
DU10-SU11	-112.76161	41.65877	7/8/2018			X			X									X										
DU10-SU11	-112.76161	41.65428	7/8/2018			X			X									X										
DU10-SU11	-112.76161	41.64979	7/8/2018			X			X									X										
DU10-SU11	-112.76161	41.64530	7/8/2018			X			X									X										
DU10-SU11	-112.76161	41.64081	7/8/2018			X			X									X										
DU10-SU11	-112.76161	41.63631	7/8/2018			X			X									X										
DU10-SU11	-112.76161	41.63182	7/8/2018			X			X									X										
DU10-SU11	-112.75568	41.66326	7/8/2018			X			X									X										
DU10-SU11	-112.75568	41.65877	7/8/2018			X			X									X										
DU10-SU11	-112.75568	41.65428	7/8/2018			X			X									X										
DU10-SU11	-112.75568	41.64979	7/8/2018			X			X									X										
DU10-SU11	-112.75568	41.64530	7/8/2018			X			X									X										
DU10-SU11	-112.75568	41.64081	7/8/2018			X			X									X										
DU10-SU11	-112.75568	41.63631	7/8/2018			X			X									X										
DU10-SU11	-112.75568	41.63182	7/8/2018		X					X				X														
DU10-SU11	-112.74975	41.66326	7/8/2018			X			X									X										
DU10-SU11	-112.74975	41.65877	7/8/2018			X			X									X										
DU10-SU11	-112.74975	41.65428	7/8/2018			X			X									X										
DU10-SU11	-112.74975	41.64979	7/8/2018			X			X									X										
DU10-SU11	-112.74975	41.64530	7/8/2018			X			X							X		X										
DU10-SU11	-112.74975	41.63631	7/8/2018			X			X									X										
DU10-SU11	-112.74975	41.63182	7/8/2018			X			X									X										
DU10-SU11	-112.74382	41.66326	7/8/2018			X			X									X										
DU10-SU11	-112.74382	41.65877	7/8/2018			X							X					X										
DU10-SU11	-112.74382	41.65428	7/8/2018			X			X									X	X									
DU10-SU11	-112.74382	41.64979	7/8/2018			X			X									X	X									
DU10-SU11	-112.74382	41.64530	7/8/2018			X			X									X										
DU10-SU11	-112.73789	41.66326	7/8/2018			X			X									X										

Sample ID	Longitude	Latitude	Date	V	SV	NV	TC	MC	SC	NC	ETC	EMC	ESC	VF	COL	COM	COS	SA	B	SND	BM	EBM	BH	HAL	GYP	HEX	CIR	MR
DU10-SU12	-112.77940	41.69919	7/2/2018			X			X									X			X							
DU10-SU12	-112.77940	41.69470	7/2/2018			X			X									X			X							
DU10-SU12	-112.77940	41.69021	7/2/2018			X			X									X										
DU10-SU12	-112.77940	41.68572	7/2/2018			X			X									X										
DU10-SU12	-112.77940	41.68123	7/2/2018			X			X									X										
DU10-SU12	-112.77940	41.67674	7/2/2018			X			X					X				X										
DU10-SU12	-112.77940	41.67224	7/2/2018			X			X									X										
DU10-SU12	-112.77940	41.66775	7/2/2018			X			X									X										
DU10-SU12	-112.77347	41.69919	7/2/2018			X			X									X										
DU10-SU12	-112.77347	41.69470	7/2/2018			X			X									X										
DU10-SU12	-112.77347	41.69021	7/2/2018			X			X									X										
DU10-SU12	-112.77347	41.68572	7/2/2018			X			X									X										
DU10-SU12	-112.77347	41.68123	7/2/2018			X			X									X										
DU10-SU12	-112.77347	41.67674	7/2/2018			X			X									X										
DU10-SU12	-112.77347	41.67224	7/2/2018			X			X									X										
DU10-SU12	-112.77347	41.66775	7/2/2018			X			X									X	X									
DU10-SU12	-112.76754	41.69919	7/2/2018			X			X									X	X									
DU10-SU12	-112.76754	41.69470	7/2/2018			X			X									X										
DU10-SU12	-112.76754	41.69021	7/2/2018	X										X														
DU10-SU12	-112.76754	41.68572	7/2/2018			X							X					X										
DU10-SU12	-112.76754	41.68123	7/2/2018			X			X									X										
DU10-SU12	-112.76754	41.67674	7/2/2018			X			X									X										
DU10-SU12	-112.76754	41.67224	7/2/2018			X			X									X										
DU10-SU12	-112.76754	41.66775	7/2/2018			X			X									X										
DU10-SU12	-112.76161	41.69919	7/2/2018			X			X									X										
DU10-SU12	-112.76161	41.69470	7/2/2018			X							X					X										
DU10-SU12	-112.76161	41.69021	7/2/2018	X										X														
DU10-SU12	-112.76161	41.68572	7/2/2018			X							X					X										
DU10-SU12	-112.76161	41.68123	7/2/2018			X							X					X										
DU10-SU12	-112.76161	41.67674	7/2/2018			X							X					X										
DU10-SU12	-112.76161	41.67224	7/2/2018			X							X					X										
DU10-SU12	-112.76161	41.66775	7/2/2018			X			X									X										
DU10-SU12	-112.75568	41.69919	7/2/2018			X			X									X										
DU10-SU12	-112.75568	41.69470	7/2/2018			X							X					X										
DU10-SU12	-112.75568	41.69021	7/2/2018			X			X									X										
DU10-SU12	-112.75568	41.68572	7/2/2018			X							X					X										
DU10-SU12	-112.75568	41.68123	7/2/2018			X							X					X										
DU10-SU12	-112.75568	41.67674	7/2/2018			X							X					X										
DU10-SU12	-112.75568	41.67224	7/2/2018			X							X					X										
DU10-SU12	-112.75568	41.66775	7/2/2018			X			X									X										
DU10-SU12	-112.74975	41.69919	7/2/2018			X							X	X				X										
DU10-SU12	-112.74975	41.69470	7/2/2018			X							X					X										
DU10-SU12	-112.74975	41.69021	7/2/2018			X							X					X										
DU10-SU12	-112.74975	41.68572	7/2/2018			X							X					X										
DU10-SU12	-112.74975	41.68123	7/2/2018			X							X					X										
DU10-SU12	-112.74975	41.67674	7/2/2018	X										X														
DU10-SU12	-112.74975	41.67224	7/2/2018			X			X									X										
DU10-SU12	-112.74975	41.66775	7/2/2018			X			X									X										
DU10-SU12	-112.74382	41.69919	7/2/2018			X			X									X										
DU10-SU12	-112.74382	41.69470	7/2/2018			X							X					X										
DU10-SU12	-112.74382	41.69021	7/2/2018			X							X					X										
DU10-SU12	-112.74382	41.68572	7/2/2018	X										X														
DU10-SU12	-112.74382	41.68123	7/2/2018			X							X					X										
DU10-SU12	-112.74382	41.67674	7/2/2018			X							X					X										
DU10-SU12	-112.74382	41.67224	7/2/2018		X			X						X				X										
DU10-SU12	-112.74382	41.66775	7/2/2018			X			X									X										
DU10-SU12	-112.73789	41.69919	7/2/2018			X							X					X										
DU10-SU12	-112.73789	41.69470	7/2/2018			X							X					X										
DU10-SU12	-112.73789	41.69021	7/2/2018			X							X					X										
DU10-SU12	-112.73789	41.68572	7/2/2018			X							X					X										
DU10-SU12	-112.73789	41.68123	7/2/2018			X							X					X										
DU10-SU12	-112.73789	41.67674	7/2/2018			X							X					X										
DU10-SU12	-112.73789	41.67224	7/2/2018			X			X									X										
DU10-SU12	-112.73789	41.66775	7/2/2018			X			X									X										

Sample ID	Longitude	Latitude	Date	V	SV	NV	TC	MC	SC	NC	ETC	EMC	ESC	VF	COL	COM	COS	SA	B	SND	BM	EBM	BH	HAL	GYP	HEX	CIR	MR
DU10-SU13	-112.83278	41.70368	12/9/2017			X			X									X										
DU10-SU13	-112.82685	41.70817	12/9/2017			X			X									X										
DU10-SU13	-112.82685	41.70368	12/9/2017			X			X									X										
DU10-SU13	-112.82092	41.70817	12/9/2017			X			X									X										
DU10-SU13	-112.82092	41.70368	12/9/2017			X			X									X										
DU10-SU13	-112.81499	41.71266	12/9/2017			X			X									X										
DU10-SU13	-112.81499	41.70817	12/9/2017			X			X									X										
DU10-SU13	-112.81499	41.70368	12/9/2017			X			X									X										
DU10-SU13	-112.80906	41.71266	12/9/2017			X			X									X										
DU10-SU13	-112.80906	41.70817	12/9/2017			X			X									X										
DU10-SU13	-112.80906	41.70368	12/9/2017			X			X									X										
DU10-SU13	-112.80313	41.71266	12/9/2017			X			X									X										
DU10-SU13	-112.80313	41.70817	12/9/2017			X			X									X										
DU10-SU13	-112.80313	41.70368	12/9/2017			X			X									X										
DU10-SU13	-112.79720	41.71266	12/9/2017			X			X									X										
DU10-SU13	-112.79720	41.70817	12/9/2017		X				X					X														
DU10-SU13	-112.79720	41.70368	12/9/2017			X			X									X										
DU10-SU13	-112.79127	41.71266	12/9/2017			X			X									X										
DU10-SU13	-112.79127	41.70817	12/9/2017			X			X									X										
DU10-SU13	-112.79127	41.70368	12/9/2017			X			X									X										
DU10-SU13	-112.78534	41.71266	12/9/2017			X			X																			
DU10-SU13	-112.78534	41.70817	12/9/2017			X			X									X										
DU10-SU13	-112.77941	41.71266	12/9/2017			X			X									X										
DU10-SU13	-112.76754	41.71266	12/9/2017			X		X																				
DU10-SU13	-112.76754	41.70817	12/9/2017			X			X									X										
DU10-SU13	-112.76754	41.70368	12/9/2017			X			X									X										
DU10-SU13	-112.76161	41.71266	12/9/2017			X			X																	X		
DU10-SU13	-112.76161	41.70368	12/9/2017			X			X									X										
DU10-SU13	-112.75568	41.71266	12/9/2017			X			X																			
DU10-SU13	-112.75568	41.70817	12/9/2017			X			X																			
DU10-SU13	-112.75568	41.70368	12/9/2017			X			X									X										
DU10-SU13	-112.74975	41.70817	12/9/2017			X			X																			
DU10-SU13	-112.74975	41.70368	12/9/2017			X			X									X										
DU10-SU13	-112.74382	41.70817	12/9/2017			X			X									X										
DU10-SU13	-112.74382	41.70368	12/9/2017			X			X									X										
DU10-SU13	-112.73789	41.70368	12/9/2017			X			X																			

Sample ID	Longitude	Latitude	Date	V	SV	NV	TC	MC	SC	NC	ETC	EMC	ESC	VF	COL	COM	COS	SA	B	SND	BM	EBM	BH	HAL	GYP	HEX	CIR	MR
DU10-SU14	-112.82685	41.69919	10/18/2017			X			X									X	X									
DU10-SU14	-112.82685	41.69470	10/18/2017			X			X									X	X									
DU10-SU14	-112.82685	41.69021	10/18/2017			X			X									X									X	
DU10-SU14	-112.82685	41.68572	10/18/2017			X			X									X	X								X	
DU10-SU14	-112.82685	41.68123	10/18/2017			X			X									X									X	
DU10-SU14	-112.82685	41.67224	10/18/2017			X			X									X										
DU10-SU14	-112.82685	41.66775	10/18/2017			X			X									X										
DU10-SU14	-112.82092	41.69919	10/18/2017			X			X									X										
DU10-SU14	-112.82092	41.69470	10/18/2017			X		X										X										
DU10-SU14	-112.82092	41.69021	10/18/2017			X			X									X									X	
DU10-SU14	-112.82092	41.68572	10/18/2017			X			X									X									X	
DU10-SU14	-112.82092	41.68123	10/18/2017			X			X									X									X	
DU10-SU14	-112.82092	41.67674	10/18/2017			X			X									X	X		X							
DU10-SU14	-112.82092	41.67224	10/18/2017			X			X									X										
DU10-SU14	-112.82092	41.66775	10/18/2017			X			X									X										
DU10-SU14	-112.81499	41.69919	10/18/2017			X			X									X										
DU10-SU14	-112.81499	41.69470	10/18/2017			X			X									X										
DU10-SU14	-112.81499	41.69021	10/18/2017			X			X									X									X	
DU10-SU14	-112.81499	41.68572	10/18/2017			X			X									X										
DU10-SU14	-112.81499	41.68123	10/18/2017			X			X									X										
DU10-SU14	-112.81499	41.67674	10/18/2017			X			X									X	X									
DU10-SU14	-112.81499	41.67224	10/18/2017			X			X									X										
DU10-SU14	-112.80906	41.69919	10/18/2017			X			X									X										
DU10-SU14	-112.80906	41.69470	10/18/2017			X			X									X									X	
DU10-SU14	-112.80906	41.69021	10/18/2017			X			X									X									X	
DU10-SU14	-112.80906	41.68572	10/18/2017			X			X									X										
DU10-SU14	-112.80906	41.68123	10/18/2017			X			X									X										
DU10-SU14	-112.80906	41.67674	10/18/2017			X			X									X										
DU10-SU14	-112.80906	41.67224	10/18/2017			X			X									X										
DU10-SU14	-112.80313	41.69919	10/18/2017			X			X									X										
DU10-SU14	-112.80313	41.69470	10/18/2017			X			X									X										
DU10-SU14	-112.80313	41.69021	10/18/2017			X			X									X									X	
DU10-SU14	-112.80313	41.68572	10/18/2017			X			X									X										
DU10-SU14	-112.80313	41.68123	10/18/2017			X			X									X										
DU10-SU14	-112.80313	41.67674	10/18/2017			X			X									X										
DU10-SU14	-112.80313	41.67224	10/18/2017			X			X									X										
DU10-SU14	-112.79720	41.69919	10/18/2017			X			X									X										
DU10-SU14	-112.79720	41.69470	10/18/2017			X			X									X										
DU10-SU14	-112.79720	41.69021	10/18/2017			X			X									X									X	
DU10-SU14	-112.79720	41.68572	10/18/2017			X			X									X										
DU10-SU14	-112.79720	41.68123	10/18/2017			X			X									X										
DU10-SU14	-112.79720	41.67674	10/18/2017			X			X									X										
DU10-SU14	-112.79720	41.67224	10/18/2017			X			X									X										
DU10-SU14	-112.79127	41.69919	10/18/2017			X			X									X										
DU10-SU14	-112.79127	41.69470	10/18/2017			X			X									X										
DU10-SU14	-112.79127	41.69021	10/18/2017			X			X									X										
DU10-SU14	-112.79127	41.68572	10/18/2017			X			X									X										
DU10-SU14	-112.79127	41.68123	10/18/2017			X			X									X										
DU10-SU14	-112.79127	41.67674	10/18/2017			X			X									X										
DU10-SU14	-112.79127	41.67224	10/18/2017			X			X									X										
DU10-SU14	-112.78534	41.69919	10/18/2017			X		X										X										
DU10-SU14	-112.78534	41.69470	10/18/2017			X			X									X										
DU10-SU14	-112.78534	41.69021	10/18/2017			X			X									X										
DU10-SU14	-112.78534	41.68572	10/18/2017			X			X									X	X									
DU10-SU14	-112.78534	41.68123	10/18/2017			X			X									X	X		X							
DU10-SU14	-112.78534	41.67674	10/18/2017			X			X									X										
DU10-SU14	-112.78534	41.67224	10/18/2017			X			X									X										

Sample ID	Longitude	Latitude	Date	V	SV	NV	TC	MC	SC	NC	ETC	EMC	ESC	VF	COL	COM	COS	SA	B	SND	BM	EBM	BH	HAL	GYP	HEX	CIR	MR
DU10-SU15	-112.87430	41.69919	7/30/2017	X		X																						
DU10-SU15	-112.87430	41.69470	7/30/2017			X			X								X	X										
DU10-SU15	-112.87430	41.69021	7/30/2017			X			X									X										
DU10-SU15	-112.87430	41.68572	7/30/2017			X			X								X	X										
DU10-SU15	-112.87430	41.68123	7/30/2017			X							X				X	X										
DU10-SU15	-112.87430	41.67674	7/30/2017			X			X								X	X										
DU10-SU15	-112.87430	41.67224	7/30/2017			X			X								X											
DU10-SU15	-112.87430	41.66775	7/30/2017			X			X								X	X	X									
DU10-SU15	-112.87430	41.66326	7/30/2017			X							X				X											
DU10-SU15	-112.87430	41.65877	7/30/2017			X			X									X										
DU10-SU15	-112.87430	41.65428	7/30/2017			X		X										X										
DU10-SU15	-112.86837	41.69919	7/30/2017	X										X														
DU10-SU15	-112.86837	41.69470	7/30/2017			X	X											X										
DU10-SU15	-112.86837	41.69021	7/30/2017			X			X									X										
DU10-SU15	-112.86837	41.68572	7/30/2017			X			X								X	X										
DU10-SU15	-112.86837	41.68123	7/30/2017			X			X								X	X										
DU10-SU15	-112.86837	41.67674	7/30/2017			X			X								X	X										
DU10-SU15	-112.86837	41.67224	7/30/2017			X			X								X	X									X	
DU10-SU15	-112.86837	41.66775	7/30/2017			X			X								X	X	X									
DU10-SU15	-112.86837	41.66326	7/30/2017			X			X								X	X										
DU10-SU15	-112.86837	41.65877	7/30/2017			X			X									X										
DU10-SU15	-112.86244	41.69919	7/30/2017			X			X																			
DU10-SU15	-112.86244	41.69470	7/30/2017			X			X									X										
DU10-SU15	-112.86244	41.69021	7/30/2017			X			X								X	X										
DU10-SU15	-112.86244	41.68572	7/30/2017			X			X								X	X										
DU10-SU15	-112.86244	41.68123	7/30/2017			X			X								X	X										
DU10-SU15	-112.86244	41.67674	7/30/2017			X			X									X										
DU10-SU15	-112.86244	41.67224	7/30/2017			X			X									X	X								X	
DU10-SU15	-112.86244	41.66775	7/30/2017			X			X									X	X								X	
DU10-SU15	-112.86244	41.66326	7/30/2017			X			X								X	X										
DU10-SU15	-112.86244	41.65877	7/30/2017			X			X									X										
DU10-SU15	-112.85651	41.69919	7/30/2017			X			X																			
DU10-SU15	-112.85651	41.69470	7/30/2017			X			X										X									
DU10-SU15	-112.85651	41.69021	7/30/2017			X			X									X										
DU10-SU15	-112.85651	41.68572	7/30/2017			X			X								X											
DU10-SU15	-112.85651	41.68123	7/30/2017			X			X									X										
DU10-SU15	-112.85651	41.67674	7/30/2017			X			X									X										
DU10-SU15	-112.85651	41.67224	7/30/2017			X			X									X										
DU10-SU15	-112.85651	41.66775	7/30/2017			X			X									X									X	
DU10-SU15	-112.85651	41.66326	7/30/2017			X			X									X										
DU10-SU15	-112.85651	41.65877	7/30/2017			X							X					X										
DU10-SU15	-112.85058	41.69919	7/30/2017			X			X																			
DU10-SU15	-112.85058	41.69470	7/30/2017			X			X									X										
DU10-SU15	-112.85058	41.69021	7/30/2017			X			X								X	X										
DU10-SU15	-112.85058	41.68572	7/30/2017			X			X								X	X										
DU10-SU15	-112.85058	41.68123	7/30/2017			X			X									X										
DU10-SU15	-112.85058	41.67674	7/30/2017			X			X									X										
DU10-SU15	-112.85058	41.67224	7/30/2017			X			X									X										
DU10-SU15	-112.85058	41.66775	7/30/2017			X			X									X										
DU10-SU15	-112.85058	41.66326	7/30/2017			X			X									X										

Sample ID	Longitude	Latitude	Date	V	SV	NV	TC	MC	SC	NC	ETC	EMC	ESC	VF	COL	COM	COS	SA	B	SND	BM	EBM	BH	HAL	GYP	HEX	CIR	MR
DU10-SU15	-112.84465	41.69919	7/30/2017			X				X				X														
DU10-SU15	-112.84465	41.69470	7/30/2017			X			X									X										
DU10-SU15	-112.84465	41.69021	7/30/2017			X			X								X	X										
DU10-SU15	-112.84465	41.68572	7/30/2017			X			X								X	X										
DU10-SU15	-112.84465	41.68123	7/30/2017			X			X									X									X	
DU10-SU15	-112.84465	41.67674	7/30/2017			X			X									X										
DU10-SU15	-112.84465	41.67224	7/30/2017			X			X									X										
DU10-SU15	-112.84465	41.66775	7/30/2017			X			X									X										
DU10-SU15	-112.84465	41.66326	7/30/2017			X			X									X										
DU10-SU15	-112.83872	41.69919	7/30/2017			X			X									X										
DU10-SU15	-112.83872	41.69470	7/30/2017			X			X									X										
DU10-SU15	-112.83872	41.69021	7/30/2017			X		X										X										
DU10-SU15	-112.83872	41.68572	7/30/2017			X			X								X	X									X	
DU10-SU15	-112.83872	41.68123	7/30/2017			X			X									X									X	
DU10-SU15	-112.83872	41.67674	7/30/2017			X			X								X	X										
DU10-SU15	-112.83872	41.67224	7/30/2017			X			X								X	X										
DU10-SU15	-112.83872	41.66775	7/30/2017			X			X									X										
DU10-SU15	-112.83279	41.69919	7/30/2017			X			X									X										
DU10-SU15	-112.83279	41.69470	7/30/2017			X			X									X	X									
DU10-SU15	-112.83279	41.69021	7/30/2017			X			X									X							X		X	
DU10-SU15	-112.83279	41.68572	7/30/2017			X			X								X	X									X	
DU10-SU15	-112.83279	41.68123	7/30/2017			X			X								X	X									X	
DU10-SU15	-112.83279	41.67674	7/30/2017			X			X								X	X										
DU10-SU15	-112.83279	41.67224	7/30/2017			X			X								X	X										
DU10-SU15	-112.83279	41.66775	7/30/2017			X			X								X	X										

Appendix D: Maps Showing the Areas of the GSL Playa which Generated Dust Plumes when Manually Disturbed

Figure D.1 Locations where the boot test produced a visible dust plume (VF) in DU1.

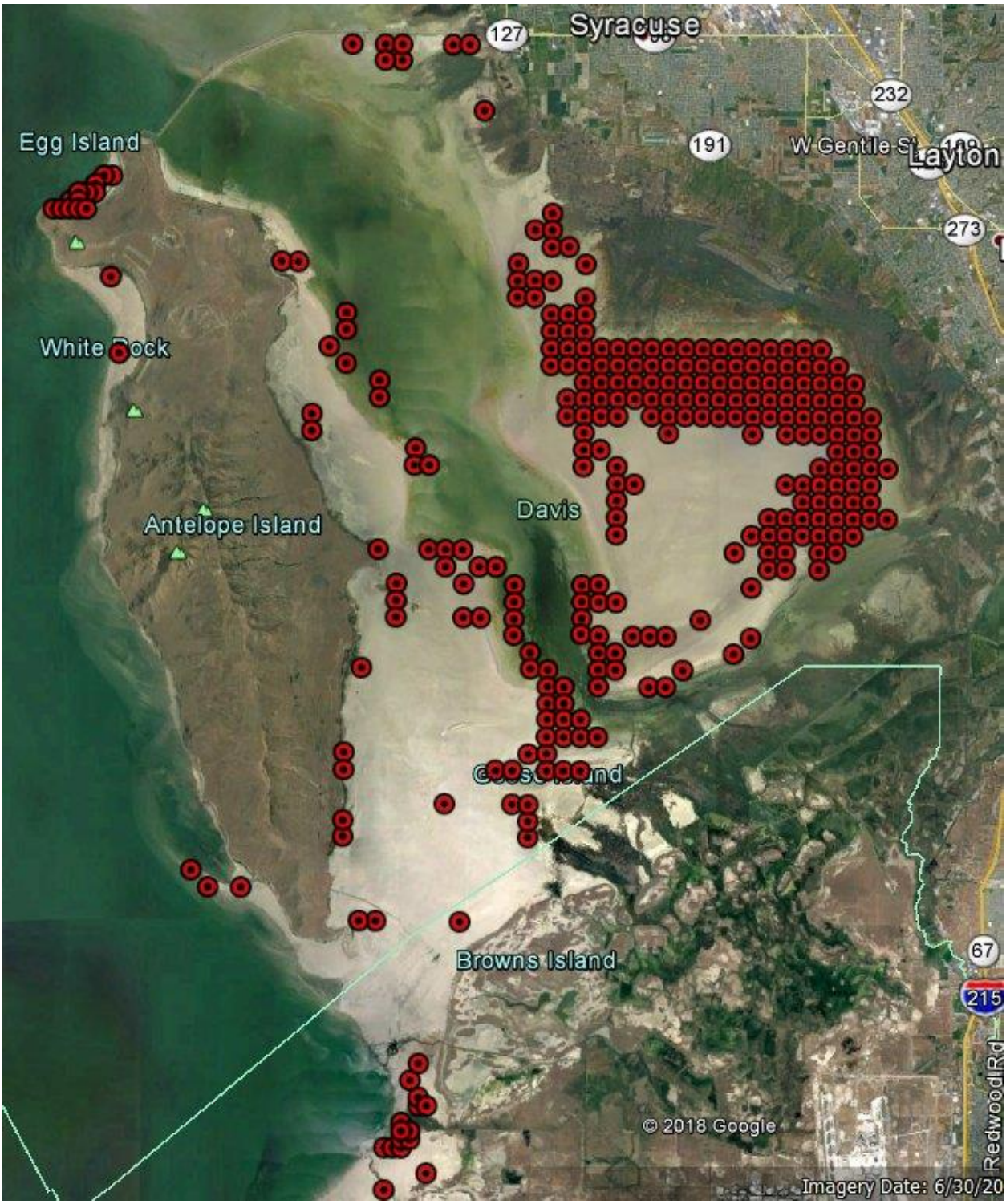

Figure D.2 Locations where the boot test produced a visible dust plume (VF) in DU2 and DU3.

Figure D.3 Locations where the boot test produced a visible dust plume (VF) in DU4.

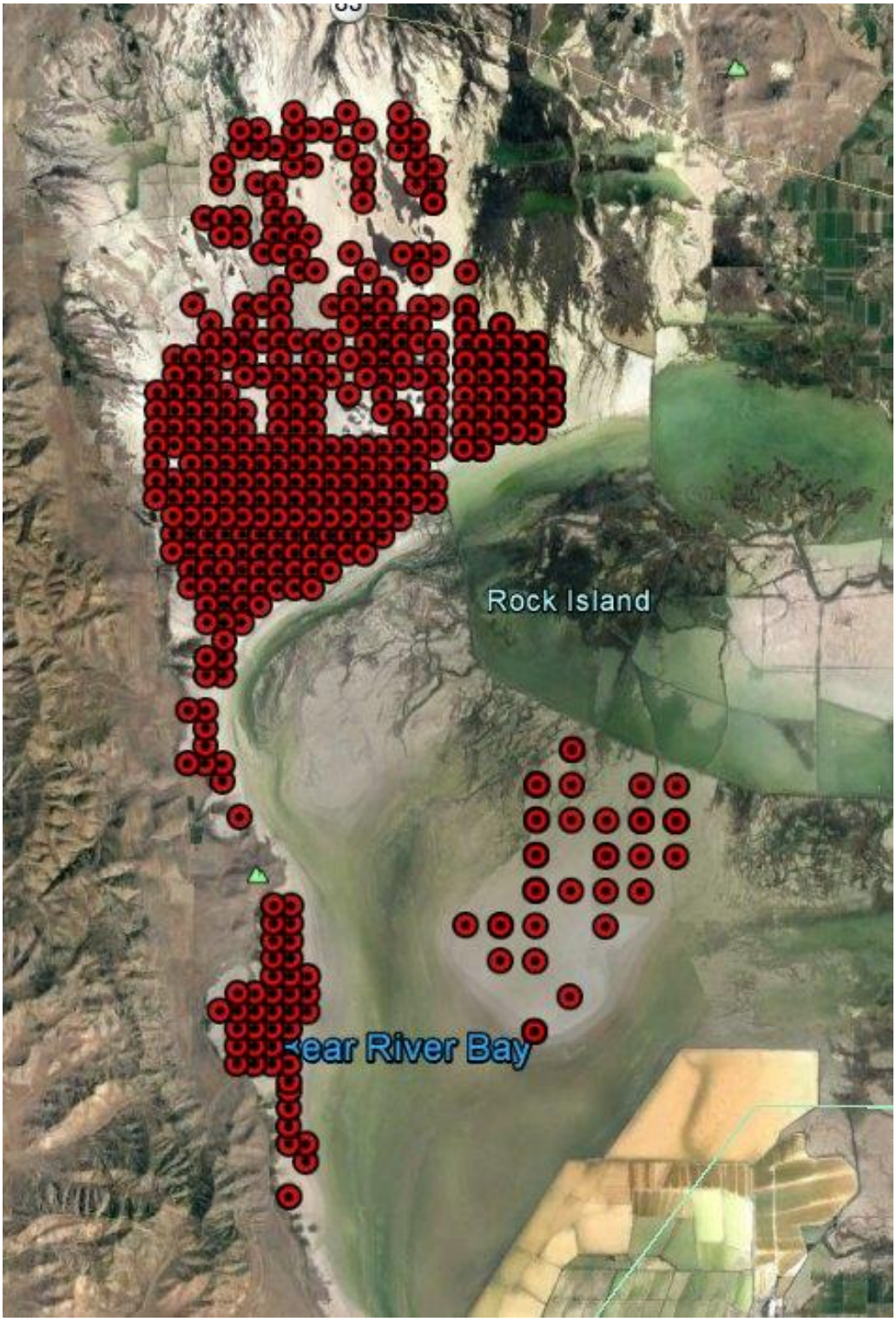

Figure D.4 Locations where the boot test produced a visible dust plume (VF) in DU5.

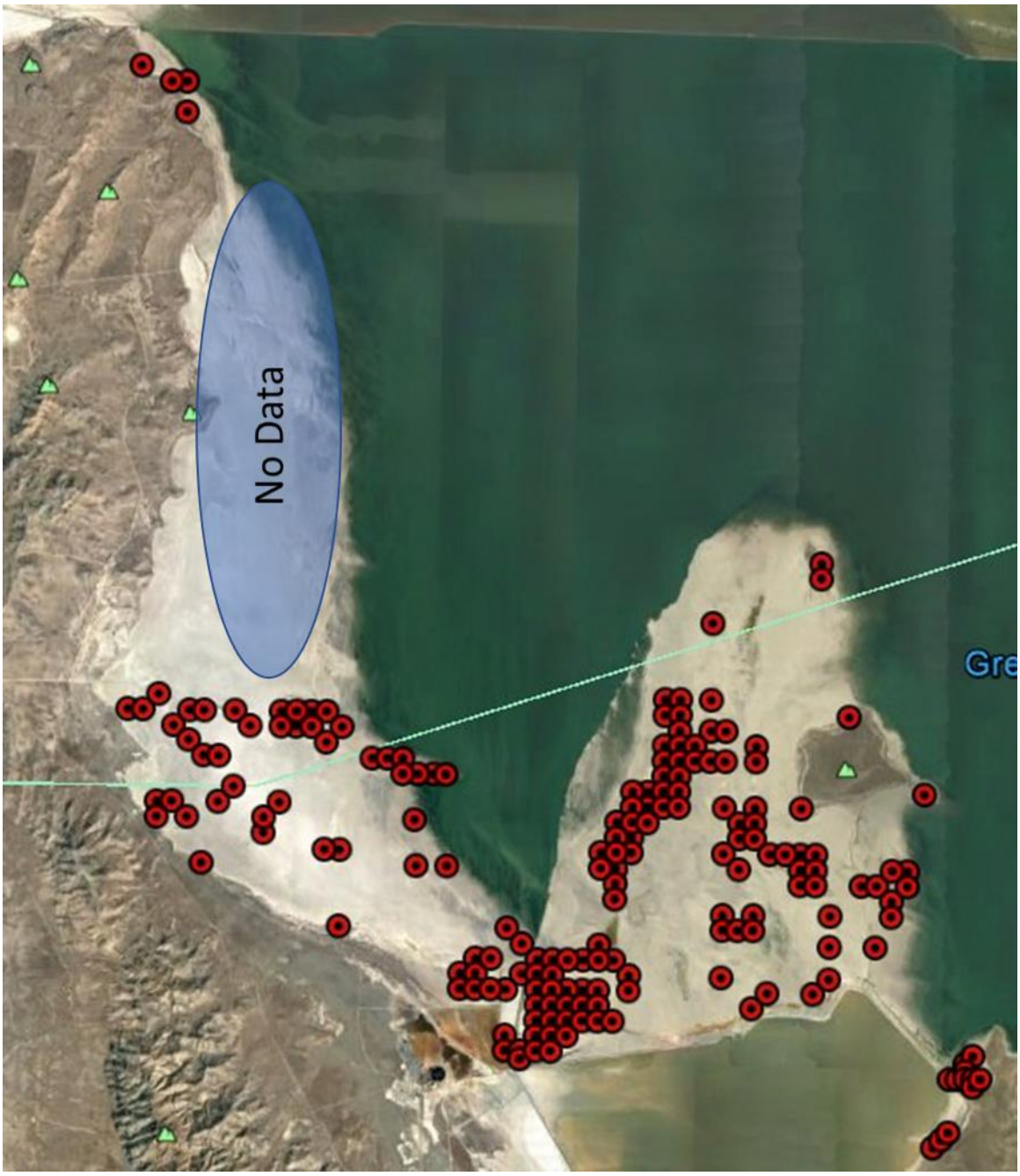

Figure D.5 Locations where the boot test produced a visible dust plume (VF) in DU6 and DU7.

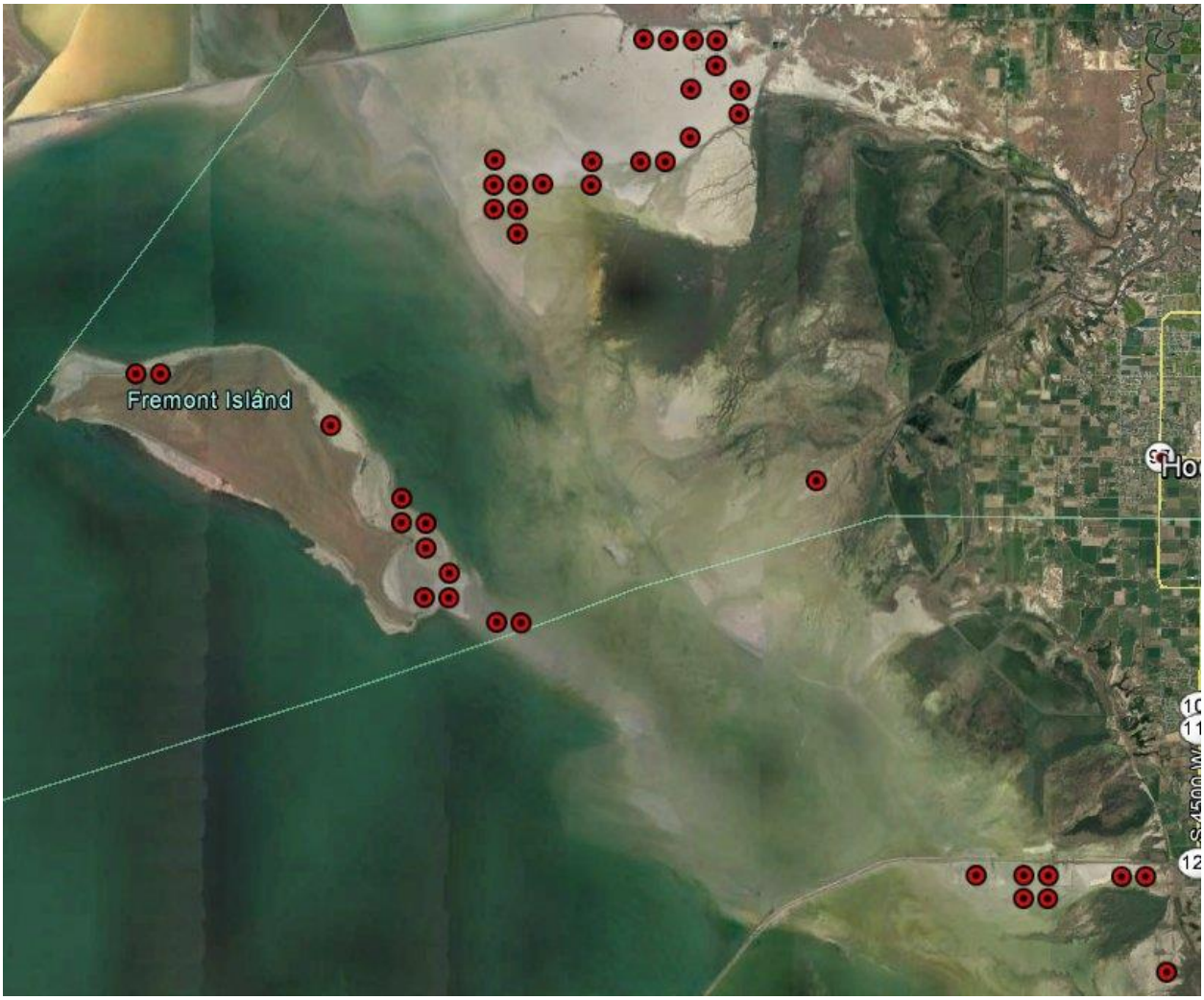

Figure D.6 Locations where the boot test produced a visible dust plume (VF) in DU8.

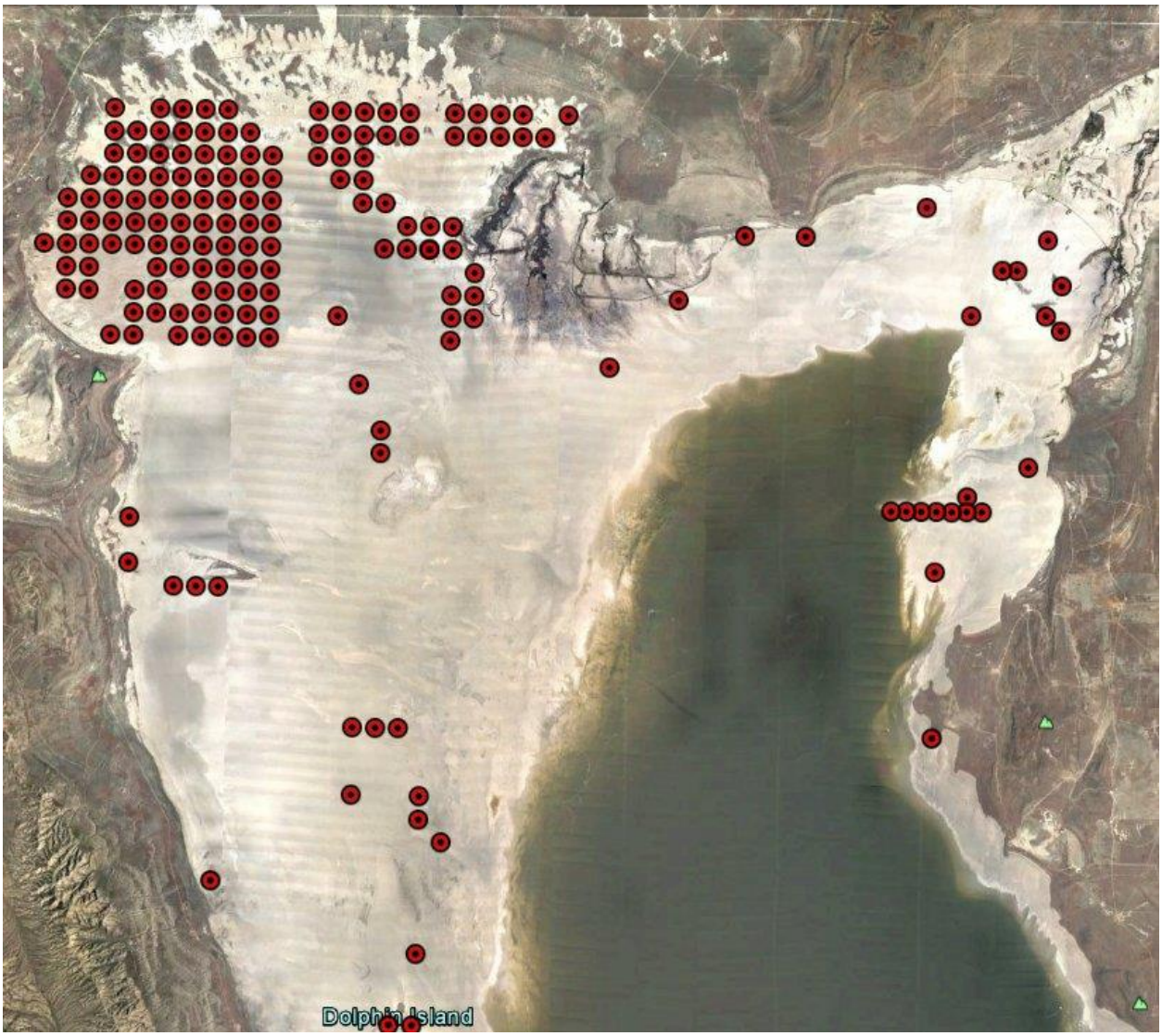

Figure D.7 Locations where the boot test produced a visible dust plume (VF) in the northern half of DU9 and DU10.

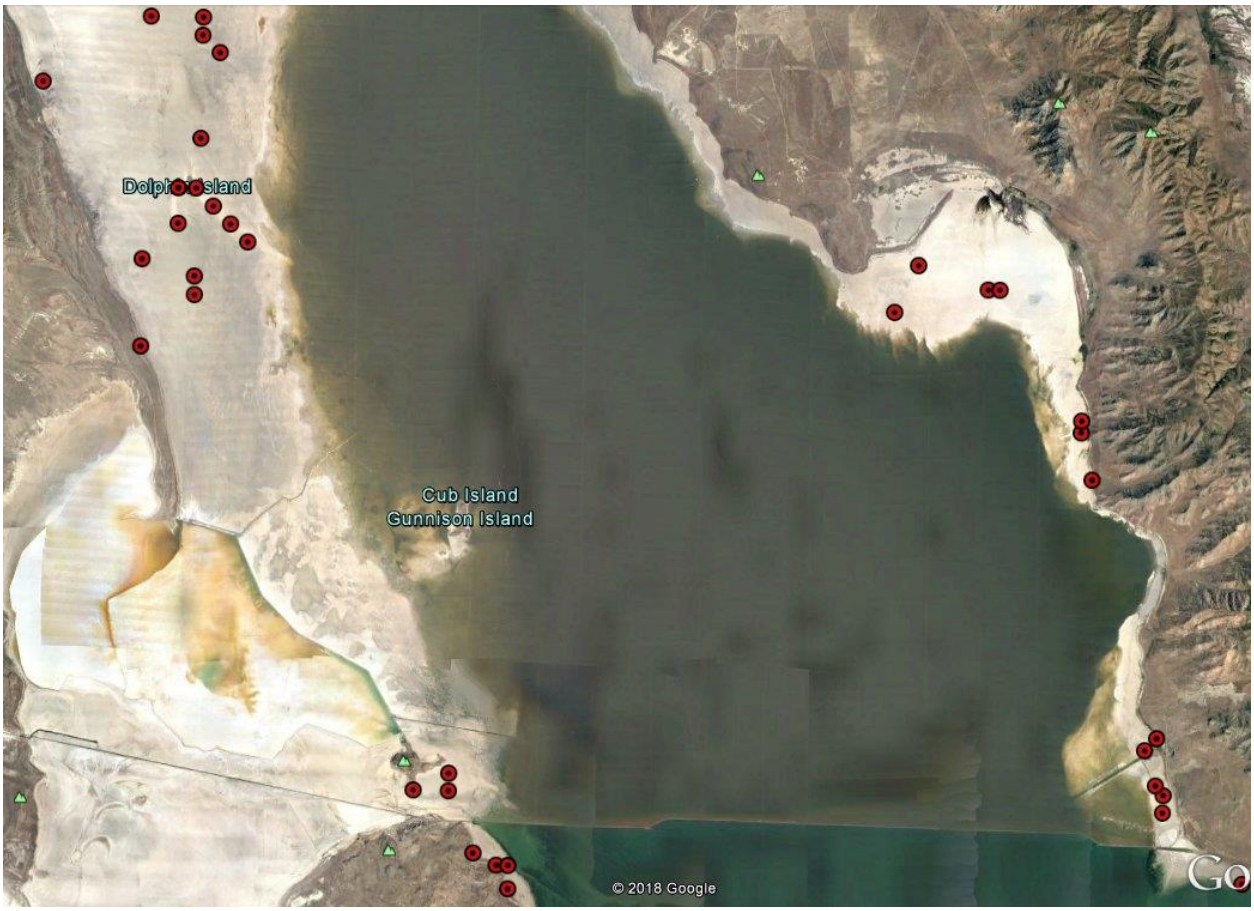

Figure D.8 Locations where the boot test produced a visible dust plume (VF) in the southern half of DU9 and DU10.

Appendix E: Maps Showing the Areas of the GSL Playa where Vegetation was Observed

Figure E.1 Locations where vegetation was observed (V or SV) in DU1. Red markers indicate that the vegetation occurred in an area where the boot test generated dust plumes from the surface.

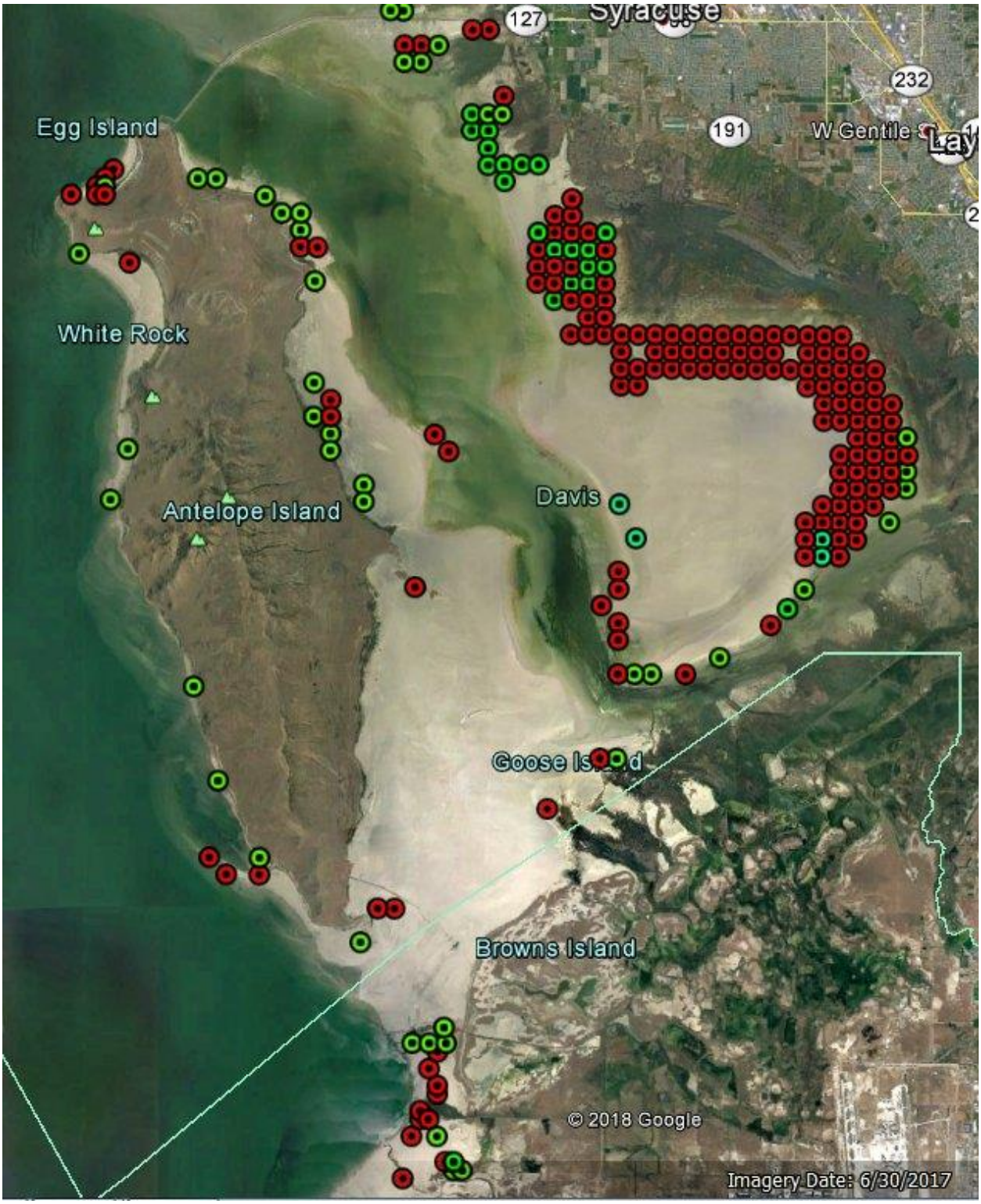

Figure E.2 Locations where vegetation was observed (V or SV) in DU2 and DU3. Red markers indicate that the vegetation occurred in an area where the boot test generated dust plumes from the surface.

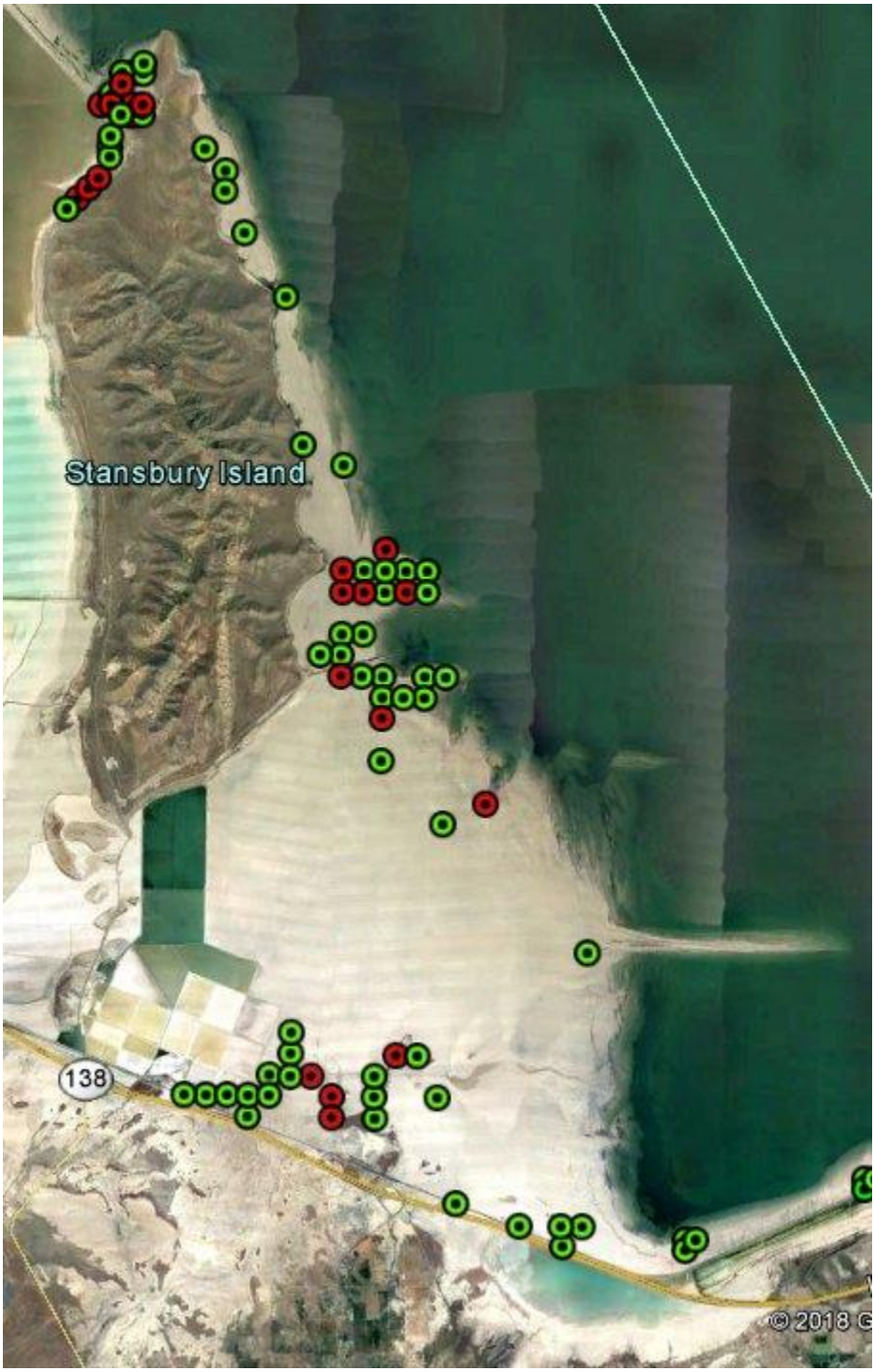

Figure E.3 Locations where vegetation was observed (V or SV) in DU4. Red markers indicate that the vegetation occurred in an area where the boot test generated dust plumes from the surface.

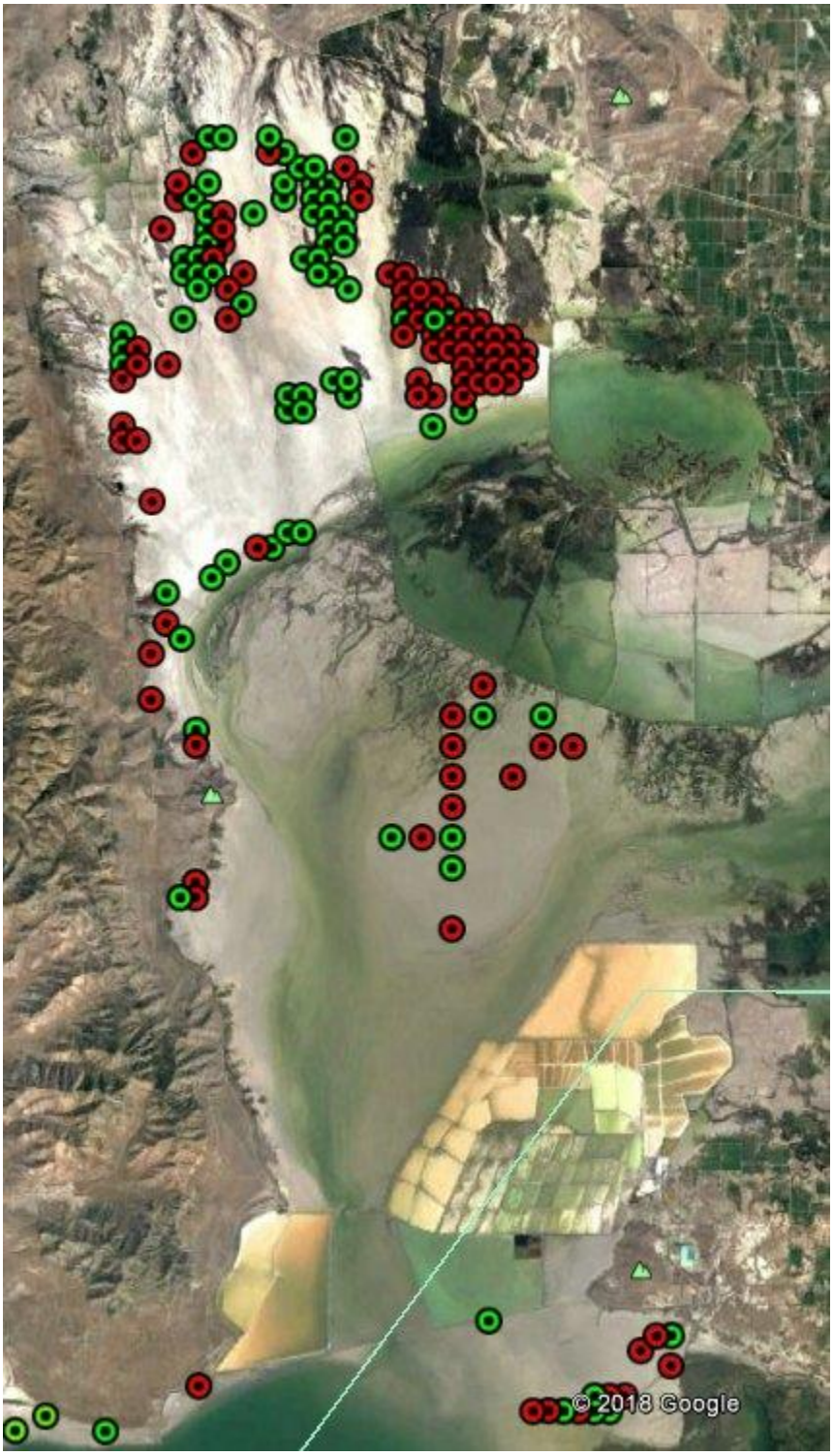

Figure E.4 Locations where vegetation was observed (V or SV) in DU5. Red markers indicate that the vegetation occurred in an area where the boot test generated dust plumes from the surface.

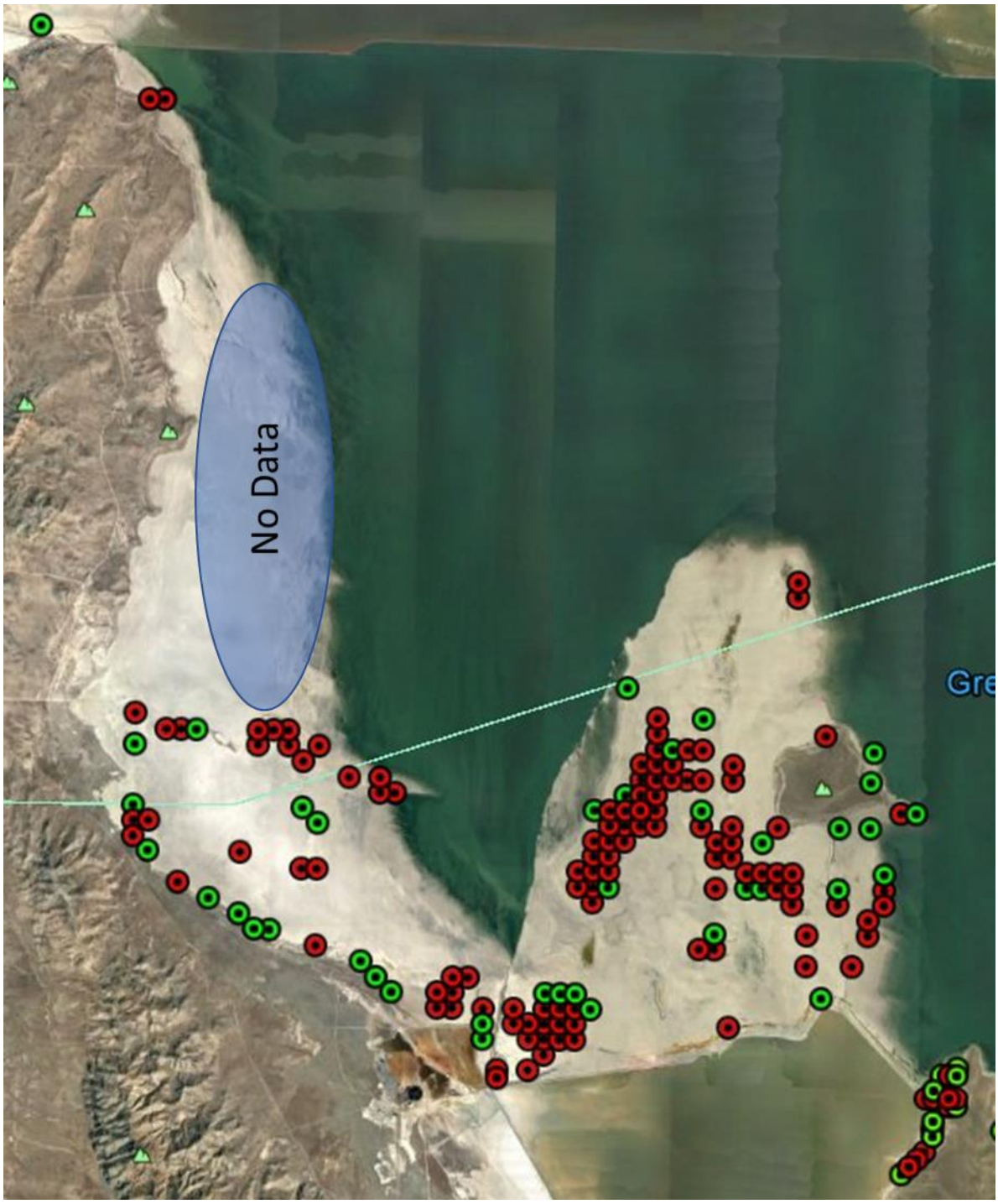

Figure E.5 Locations where vegetation was observed (V or SV) in DU6 and DU7. Red markers indicate that the vegetation occurred in an area where the boot test generated dust plumes from the surface.

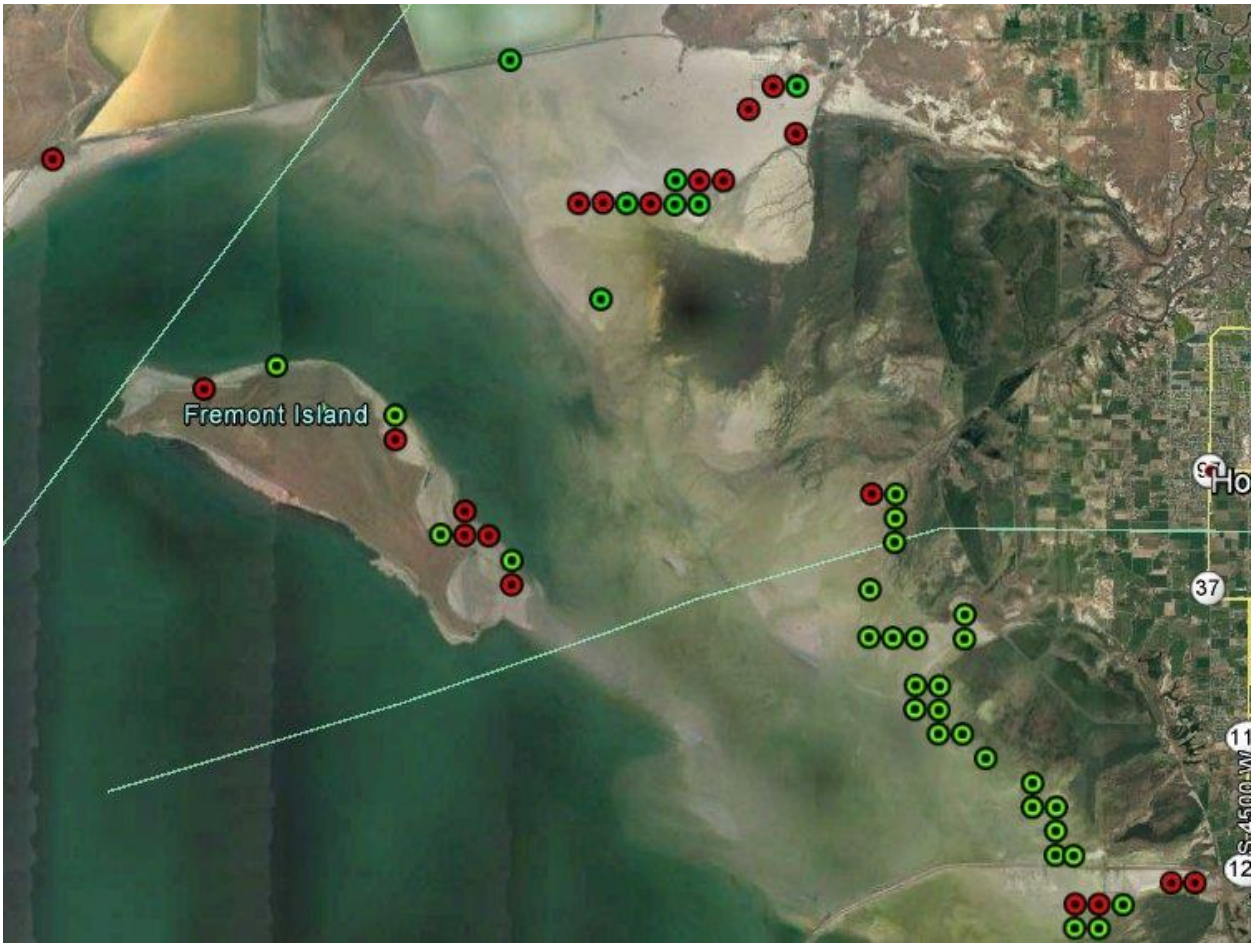

Figure E.6 Locations where vegetation was observed (V or SV) in DU8. Red markers indicate that the vegetation occurred in an area where the boot test generated dust plumes from the surface.

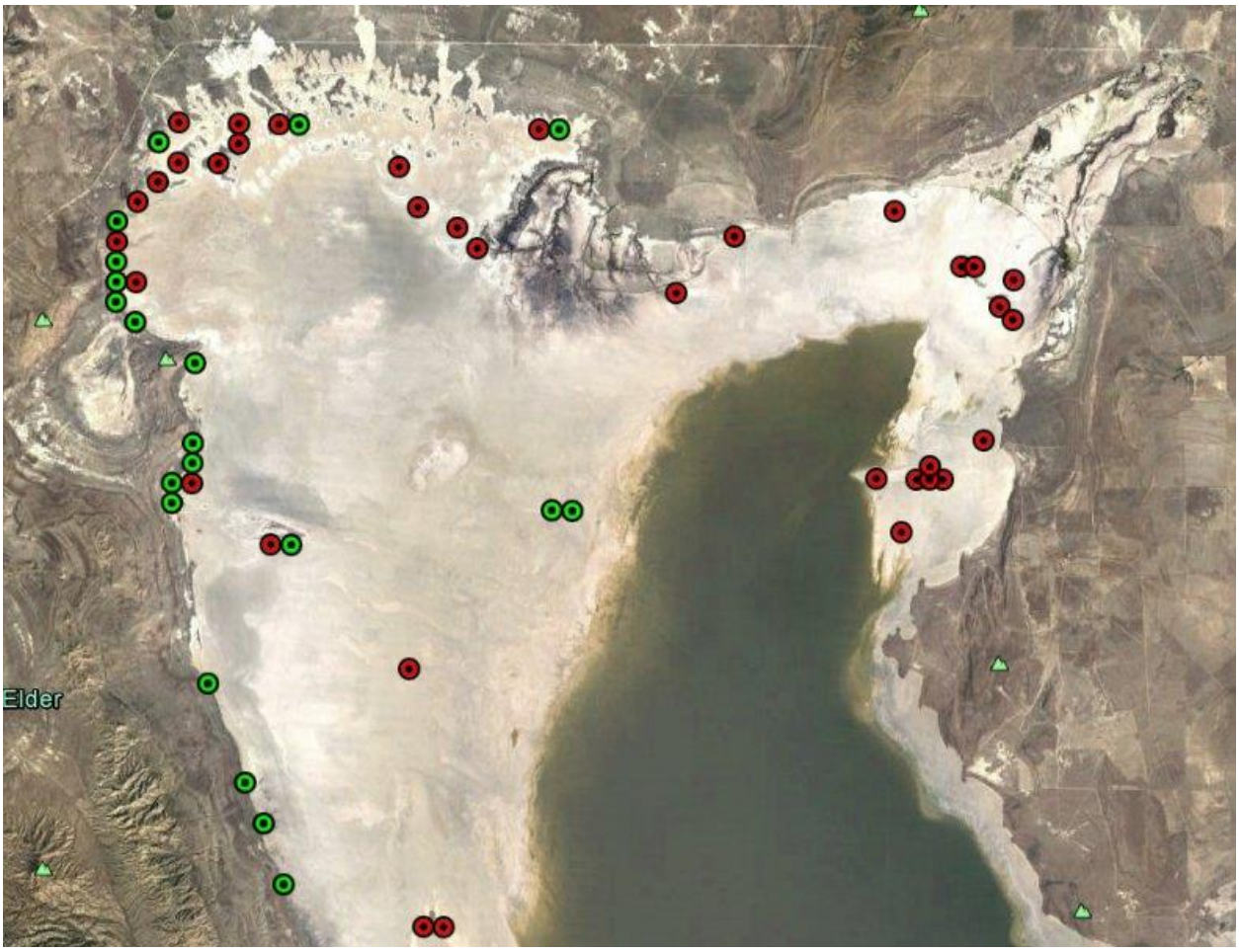

Figure E.7 Locations where vegetation was observed (V or SV) in the northern half of DU9 and DU10. Red markers indicate that the vegetation occurred in an area where the boot test generated dust plumes from the surface.

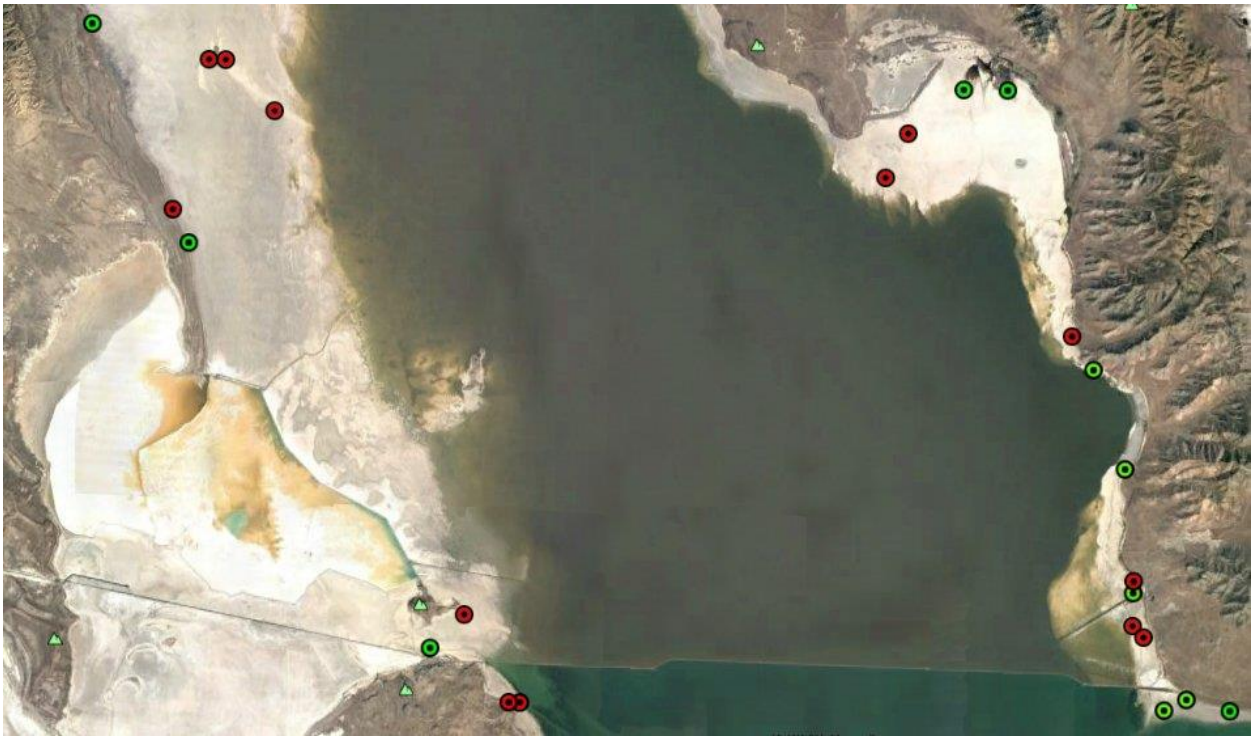

Figure E.8 Locations where vegetation was observed (V or SV) in the southern half of DU9 and DU10. Red markers indicate that the vegetation occurred in an area where the boot test generated dust plumes from the surface.

Appendix F: Maps Showing the GSL Dust "Hot Spot"s

Figure F.1 Dust "hot spot" locations for DU1.

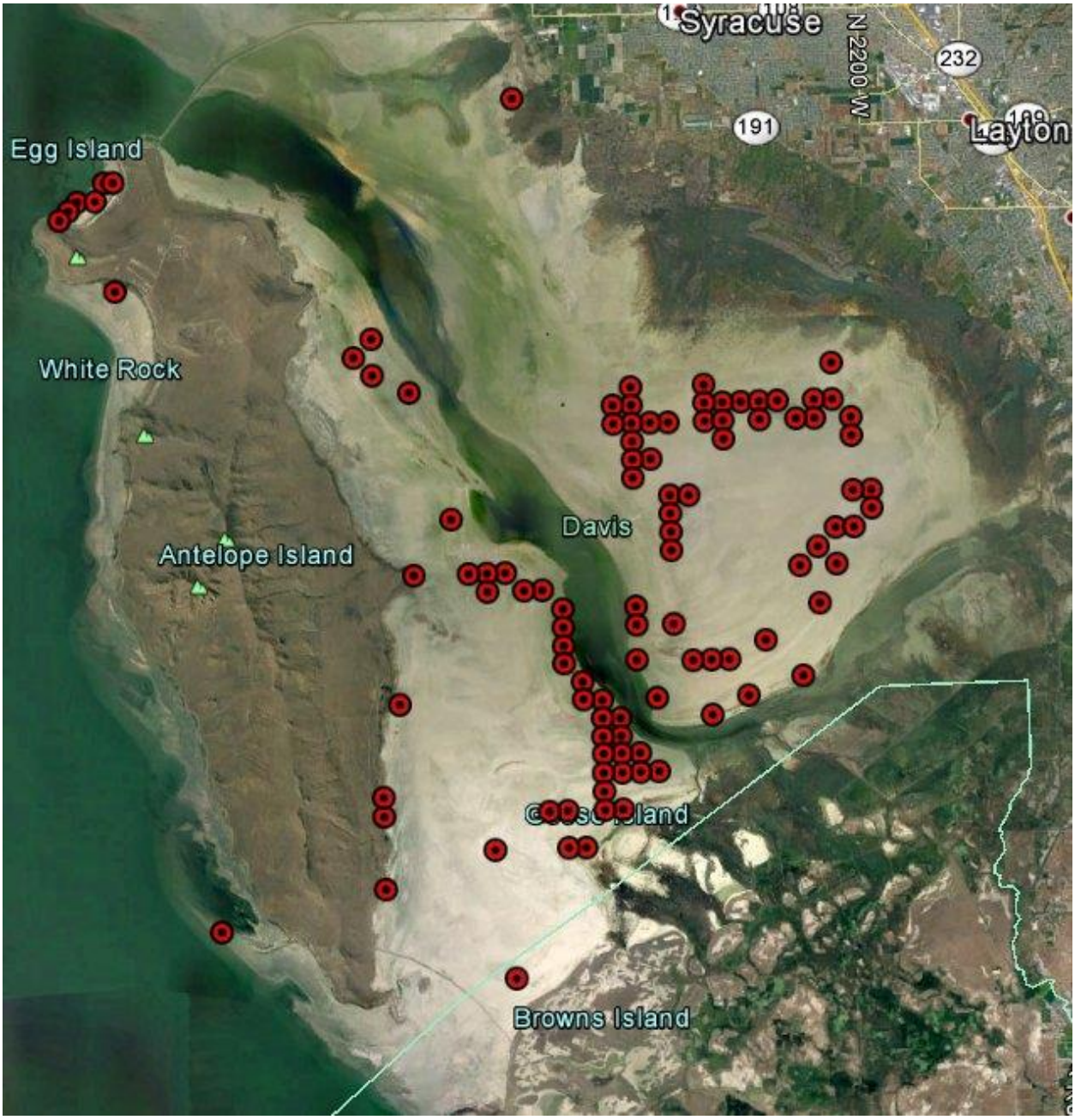

Figure F.2 Dust "hot spot" locations for DU2 and DU3.

Figure F.3 Dust “hot spot” locations for DU4.

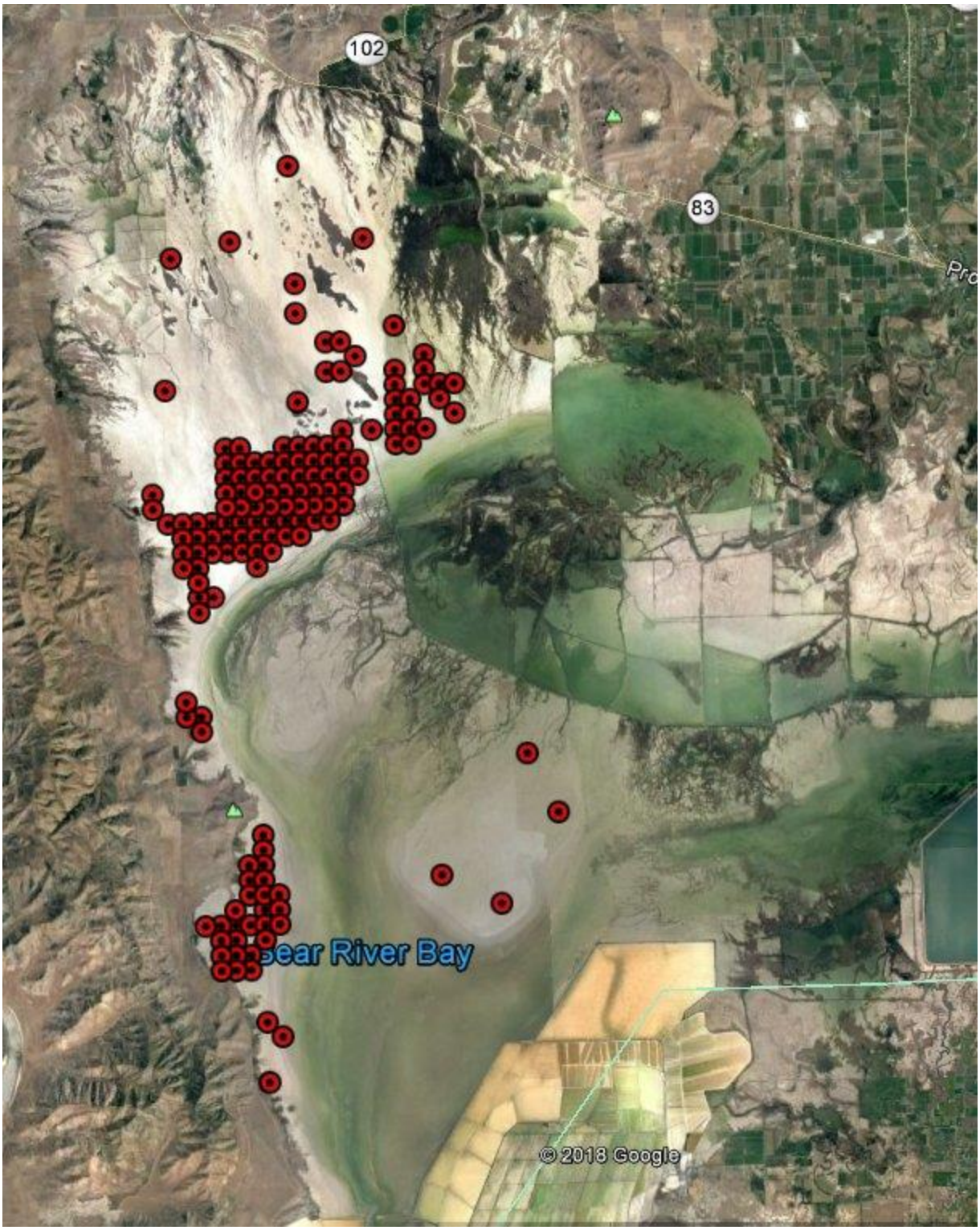

Figure F.4 Dust “hot spot” locations for DU5.

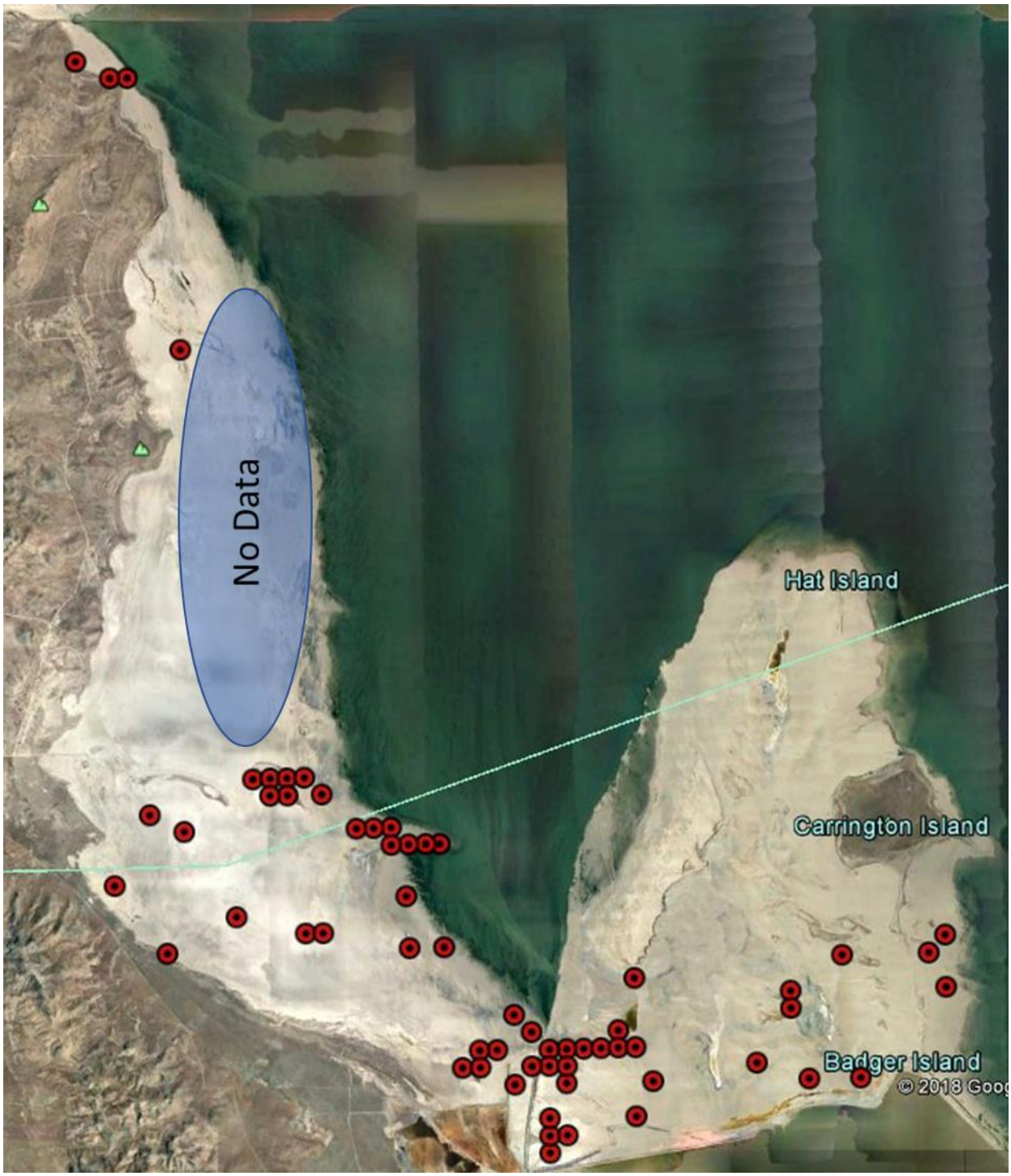

Figure F.5 Dust “hot spot” locations for DU6 and DU7.

Figure F.6 Dust “hot spot” locations for DU8.

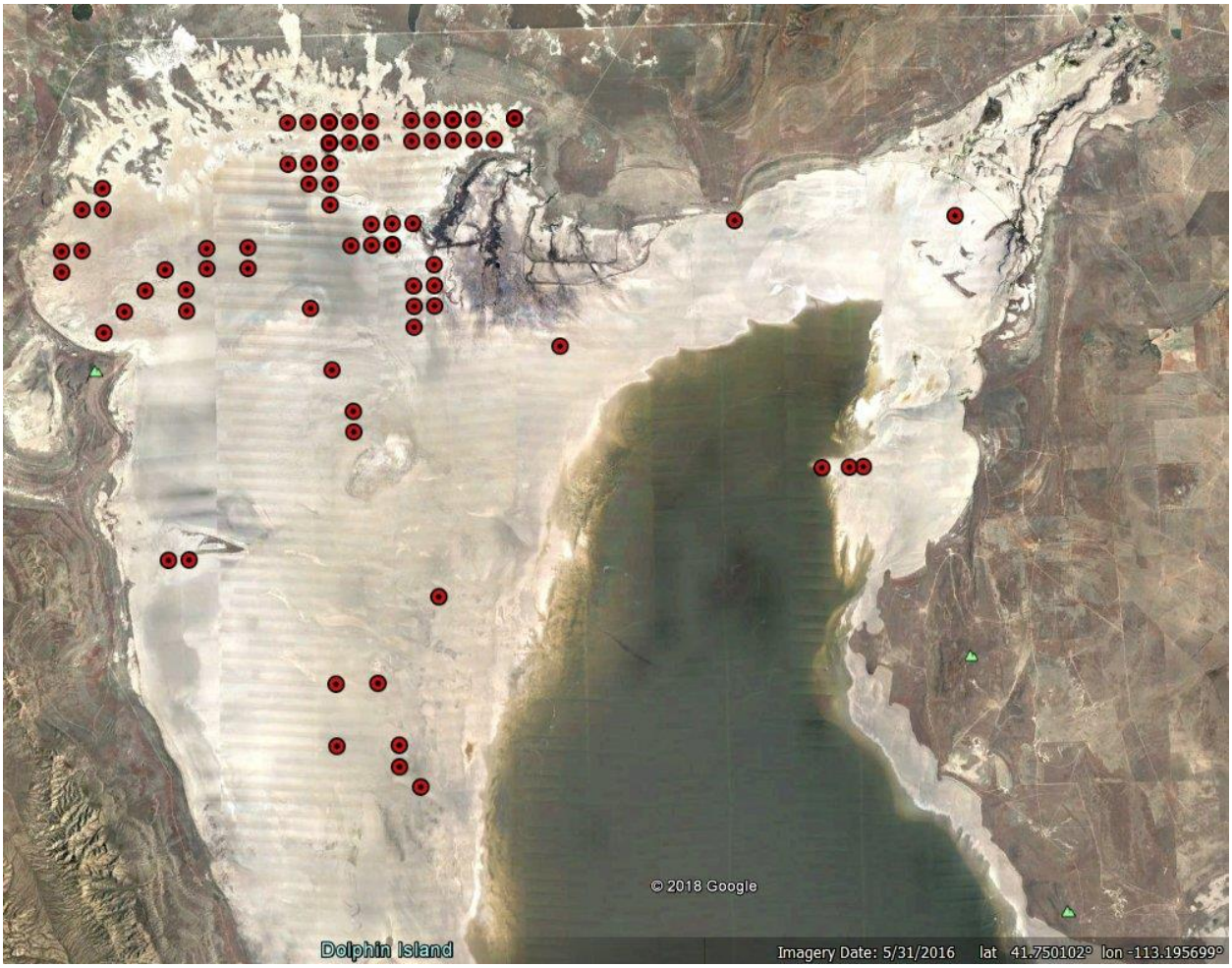

Figure F.7 Dust "hot spot" locations for the northern half of DU9 and DU10.

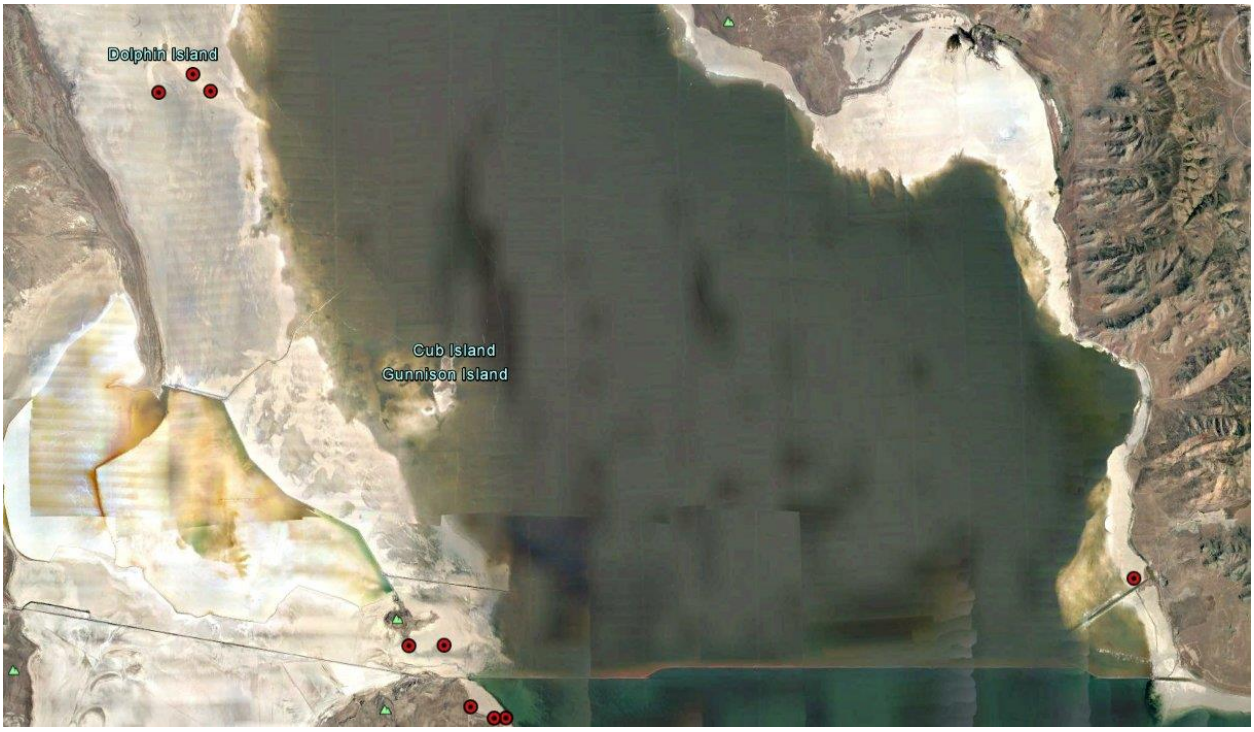

Figure F.8 Dust “hot spot” locations for the southern half of DU9 and DU10.

Appendix G: PM_{10} Elemental Mass Fraction Data

An electronic version of the data in this appendix is contained in
GSL_Dust_Plumes_Final_Report_Appendix_G.xlsx

TABLE A1.1

RESUSPENDED SOIL (PM10) ANALYTICAL RESULTS SUMMARY - ELEMENTS (A - C)

DU1 through DU4

Results in milligrams per kilogram (mg/kg-dry)

Sample Name	Latitude	Longitude	Sample Date	Aluminum	Antimony	Arsenic	Barium	Beryllium	Boron	Bromine	Cadmium	Calcium	Cerium	Cesium	Chlorine	Chromium	Cobalt	Copper
		[1]Screening Levels	*Residential RSLs*	*7740*	*3.1*	*0.68*	*1,530*	*16*	*1,560*	*NE*	*7.1*	*NE*	*NE*	*NE*	*NE*	*11,700**	*2.3*	*313*
			Industrial RSLs	*112,000*	*47*	*3.0*	*21,700*	*229*	*23,300*	*NE*	*98*	*NE*	*NE*	*NE*	*NE*	*175,000**	*35*	*4,670*
DU1-SU1	40.68191	-112.33737	6/16/2016	4378	0.89	**23.0**	118	0.16	355	41.8	0.25	114977	6.4	1.37	**40433**	98.8	**2.38**	89.4
DU1-SU2	40.70134	-112.28841	6/18/2016	5033	1.30	**39.0**	151	0.19	509	47.4	0.20	107630	7.2	1.48	**57976**	58.8	**2.40**	132.3
DU1-SU3	40.72007	-112.24714	6/19/2016	5816	2.32	**81.0**	176	0.30	767	67.2	0.25	100486	7.7	1.82	**59079**	41.2	**3.61**	**404.3**
DU1-SU4	40.75307	-112.18496	6/21/2016	**10726**	0.87	**26.0**	235	0.45	198	49.1	0.34	70798	19.8	2.82	**30780**	52.2	**4.61**	**539.0**
DU1-SU5	40.77443	-112.16576	7/1/2016	**16512**	2.03	**27.0**	259	0.68	323	67.9	0.43	70535	25.5	5.12	**38759**	41.6	**7.50**	**712.8**
DU1-SU6	40.79201	-112.14101	7/19/2016	**21492**	1.85	**28.0**	289	0.80	120	72.5	0.74	87062	30.0	7.57	**34993**	58.4	**6.36**	**316.7**
DU1-SU7	40.81083	-112.14437	7/20/2016	**26435**	2.68	**31.0**	335	1.01	324	68.6	0.89	88162	36.8	9.99	**47248**	65.7	**6.88**	206.9
DU2-SU1	40.8393	-112.14633	7/4/2016	**21417**	2.31	**37.0**	335	0.84	398	67.4	0.53	109827	32.2	7.87	**41667**	56.8	**5.85**	164.2
DU2-SU2	40.86485	-112.13326	7/21/2016	**15699**	**3.13**	**39.0**	308	0.63	423	45.3	0.45	123108	23.0	5.67	**41016**	50.8	**5.07**	180.6
DU2-SU3	40.89587	-112.09879	7/7/2016	**8206**	1.66	**19.0**	289	0.30	122	28.5	0.54	107697	12.2	3.56	**25737**	32.0	**2.84**	60.4
DU2-SU4	40.89235	-112.1451	9/4/2016	**16859**	**4.00**	**38.6**	342	0.63	448	62.4	0.47	174991	24.3	5.93	**47976**	39.3	**5.51**	167.9
DU2-SU5	40.92829	-112.14442	11/13/2016	**20283**	**3.16**	**52.5**	347	0.92	446	55.6	0.52	166619	29.7	7.02	**44410**	35.2	**6.40**	138.9
DU2-SU6	40.92275	-112.11042	9/8/2016	**10201**	2.11	**28.7**	328	0.39	361	49.3	0.56	190778	15.2	4.72	**41629**	41.9	**3.82**	71.5
DU2-SU7	40.9639	-112.14846	11/15/2016	**15465**	3.02	**39.2**	439	0.70	416	41.9	0.48	166919	26.0	5.51	**32460**	29.5	**5.29**	71.9
DU2-SU8	40.99807	-112.17333	11/20/2016	**20869**	**3.68**	**42.9**	730	0.91	399	41.0	0.57	189643	35.0	6.45	**40275**	34.4	**6.85**	70.3
DU2-SU9	41.04297	-112.1963	11/16/2016	**10286**	2.82	**38.0**	517	0.40	330	35.6	0.54	198797	15.0	3.87	**23548**	25.6	**3.67**	41.3
DU2-SU10	41.0484	-112.25678	11/26/2016	**13173**	2.21	**52.1**	422	0.50	418	36.8	0.30	204125	18.8	4.34	**24848**	47.8	**4.47**	62.7
DU2-SU11	41.02334	-112.26201	11/26/2016	**12920**	1.37	**33.1**	347	0.47	351	28.2	0.28	197186	21.2	3.47	**26997**	25.8	**3.45**	42.9
DU2-SU12	40.98318	-112.25411	2/16/2017	**16326**	2.87	**38.1**	371	0.65	326	23.7	0.30	196140	24.0	4.65	**15036**	86.4	**4.85**	65.2
DU2-SU13	40.91004	-112.23384	3/5/2017	**19479**	2.15	**47.8**	372	0.94	390	48.0	0.31	153176	33.4	5.40	**44940**	93.3	**5.65**	73.1
DU2-SU14	40.85375	-112.19491	3/3/2017	**27356**	2.22	**46.4**	456	0.84	371	33.2	0.65	176356	35.6	6.59	**22837**	46.5	**5.71**	129.5
DU3-SU1	40.93069	-112.05908	7/23/2016	**13967**	2.39	**22.0**	280	0.57	262	55.4	0.60	117328	18.9	6.69	**26063**	82.7	**4.66**	90.1
DU3-SU2	40.96349	-112.0495	7/25/2016	**15597**	**3.15**	**25.0**	263	0.58	286	38.1	0.57	84610	21.9	6.97	**32353**	39.8	**4.13**	79.7
DU3-SU3	40.96497	-112.08526	6/17/2017	**20168**	**3.69**	**33.6**	413	0.96	179	40.6	0.58	174437	31.3	9.87	**37866**	43.1	**6.61**	111.7
DU3-SU4	40.96507	-112.00103	8/18/2017	**25591**	**3.95**	**32.6**	408	0.81	220	116.9	0.93	133203	27.2	9.27	**33856**	40.7	**5.34**	94.4
DU3-SU5	40.99296	-112.00573	8/24/2017	**22337**	**4.94**	**43.1**	418	0.72	219	119.6	1.21	139772	25.0	7.70	**29387**	30.0	**4.88**	109.8
DU3-SU6	40.99443	-112.04754	8/26/2017	**21314**	**3.50**	**38.3**	399	0.68	162	94.3	0.93	129524	23.4	7.58	**31222**	29.0	**4.72**	79.5
DU3-SU7	40.99924	-112.09302	6/17/2017	**19321**	**3.88**	**38.0**	489	0.84	294	40.6	1.07	221231	30.2	9.27	**29296**	47.3	**6.26**	155.7
DU3-SU8	41.03318	-112.10444	6/1/2017	**15289**	**3.17**	**36.0**	317	0.74	396	37.6	1.05	151276	24.3	7.29	**24584**	46.3	**4.84**	100.1
DU3-SU9	41.06211	-112.12781	6/1/2017	**18292**	2.30	**35.4**	355	0.78	121	33.1	1.40	143512	27.0	9.77	**22364**	49.0	**5.74**	123.5
DU3-SU10	41.08389	-112.1512	6/1/2017	**20640**	2.99	**35.2**	328	0.92	287	34.3	1.09	131908	31.0	9.78	**20958**	54.9	**6.13**	104.8
DU4-SU1	40.68222	-112.3875	4/16/2017	**17461**	2.57	**49.4**	427	0.66	394	61.8	0.35	224155	22.2	5.85	**52037**	28.9	**4.91**	111.0
DU4-SU2	40.71437	-112.39241	4/30/2017	**10965**	2.86	**71.2**	352	0.41	776	39.7	0.18	164149	14.1	3.14	**41347**	23.6	**4.30**	74.5
DU4-SU3	40.74182	-112.38983	4/23/2017	**15559**	2.42	**73.6**	361	0.54	643	34.7	0.39	327630	20.6	4.00	**38146**	34.9	**4.85**	129.8
DU4-SU4	40.70033	-112.4299	4/24/2018	**26335**	2.48	**37.8**	573	0.84	163	58.7	0.43	162687	28.7	7.56	**42332**	28.0	**5.52**	56.8
DU4-SU5	40.71264	-112.47004	5/26/2017	**24496**	1.59	**27.1**	388	1.08	266	22.5	0.37	142723	36.6	11.75	**21039**	37.6	**6.37**	59.4
DU4-SU6	40.74093	-112.41941	4/25/2018	**15814**	1.88	**37.9**	345	0.48	199	66.8	0.27	209653	17.1	4.51	**51186**	16.3	**3.90**	72.6
DU4-SU7	40.74093	-112.44395	4/26/2018	**18909**	1.86	**34.6**	369	0.59	147	40.7	0.33	197116	19.7	6.14	**24947**	20.4	**4.09**	66.0
DU4-SU8	40.75037	-112.47583	4/28/2018	**18904**	1.85	**36.4**	339	0.60	238	68.6	0.30	171443	20.1	5.57	**32807**	18.2	**3.95**	63.1
DU4-SU9	40.78799	-112.43606	5/1/2017	**17753**	2.54	**44.7**	361	0.65	413	35.6	0.29	256808	22.3	5.41	**44377**	38.5	**5.03**	87.7
DU4-SU10	40.78045	-112.47128	6/14/2017	**22442**	2.13	**32.0**	406	0.71	249	63.2	0.53	185156	23.7	5.88	**45554**	22.8	**4.82**	59.9
DU4-SU11	40.81846	-112.45451	6/14/2017	**15570**	2.11	**36.7**	449	0.67	255	23.1	0.28	184145	24.3	5.51	**25629**	28.8	**4.98**	55.0
DU4-SU12	40.88364	-112.48194	5/14/2017	**18725**	2.27	**53.9**	381	0.70	486	40.9	0.33	192388	23.9	4.62	**81778**	38.1	**5.42**	52.7
DU4-SU13	40.9153	-112.52553	5/15/2017	**26335**	2.23	**34.9**	501	0.93	319	28.4	0.46	252502	35.3	6.31	**50155**	42.5	**6.18**	52.1

[1] - EPA Regional Screening Levels (May 2016) for residential and industrial properties (TR=1E-06, THQ=0.1) cited.

NE - Not Established

BOLD - exceeds the most conservative residential and industrial screening levels.

*Chromium III RSL values cited.

TABLE A1.2

RESUSPENDED SOIL (PM10) ANALYTICAL RESULTS SUMMARY - ELEMENTS (A - C)

DU5 through DU7

Results in milligrams per kilogram (mg/kg-dry)

Sample Name	Latitude	Longitude	Sample Date	Aluminum	Antimony	Arsenic	Barium	Beryllium	Boron	Bromine	Cadmium	Calcium	Cerium	Cesium	Chlorine	Chromium	Cobalt	Copper
	[1] *Screening Levels*		*Residential RSLs*	*7740*	*3.1*	*0.68*	*1,530*	*16*	*1,560*	*NE*	*7.1*	*NE*	*NE*	*NE*	*NE*	*11,700**	*2.3*	*313*
			Industrial RSLs	*112,000*	*47*	*3.0*	*21,700*	*229*	*23,300*	*NE*	*98*	*NE*	*NE*	*NE*	*NE*	*175,000**	*35*	*4,670*
DU5-SU1	41.28562	-112.37845	6/4/2018	**38400**	1.79	**26.7**	392	1.22	104	64.4	0.39	135761	40.9	13.15	**51776**	39.0	**7.26**	27.6
DU5-SU2	41.32209	-112.39388	6/4/2018	**40998**	1.74	**25.8**	381	1.31	112	52.4	0.39	129162	44.2	14.29	**40828**	40.3	**7.12**	30.0
DU5-SU3	41.35859	-112.40339	5/30/2018	**48375**	1.61	**23.8**	447	1.47	128	43.0	0.43	103577	60.8	15.93	**29760**	46.3	**7.69**	26.5
DU5-SU4	41.39312	-112.29923	6/25/2018	**42142**	1.11	**17.3**	413	1.40	90	43.1	0.43	140065	49.8	13.10	**30954**	43.1	**6.58**	20.4
DU5-SU5	41.39725	-112.39648	5/30/2018	**49050**	1.36	**26.1**	473	1.51	100	54.4	0.40	101618	51.9	15.87	**24770**	49.0	**7.88**	29.5
DU5-SU6	41.49835	-112.37112	6/17/2018	**57675**	1.06	**18.9**	386	1.71	108	36.9	0.49	78640	75.8	13.45	**43702**	53.3	**8.78**	25.2
DU5-SU7	41.45972	-112.42171	6/8/2018	**57045**	1.24	**18.6**	416	1.73	115	44.7	0.49	83996	63.7	14.47	**21908**	55.8	**8.83**	26.7
DU5-SU8	41.50292	-112.42205	6/10/2018	**58010**	1.06	**18.7**	387	1.65	93	41.6	0.62	83458	82.0	11.46	**26161**	55.6	**8.85**	25.5
DU5-SU9	41.53919	-112.42205	6/26/2018	**62080**	1.06	**17.4**	460	1.88	65	38.1	0.59	104951	76.1	10.63	**24943**	58.9	**9.52**	24.1
DU5-SU10	41.53919	-112.36969	6/17/2018	**61542**	1.10	**21.3**	403	1.88	80	38.9	0.56	97738	73.6	10.73	**25473**	59.2	**9.77**	26.5
DU5-SU11	41.52274	-112.3178	6/15/2018	**58206**	0.97	**21.0**	421	1.78	75	34.8	0.44	96888	61.5	12.50	**23511**	56.0	**9.35**	25.5
DU5-SU12	41.57428	-112.41513	6/12/2018	**60066**	1.17	**16.8**	477	1.82	29	39.7	0.59	107767	76.3	9.84	**27664**	59.6	**9.91**	25.1
DU5-SU13	41.57428	-112.36886	6/16/2018	**52261**	1.03	**14.5**	413	1.51	38	36.0	0.58	138914	66.2	8.93	**28809**	52.6	**8.60**	23.2
DU5-BRBR	41.44494	-112.30394	6/14/2018	**51432**	0.53	**11.7**	462	1.67	27	54.8	0.55	139333	54.5	15.30	**26725**	49.6	**7.45**	21.2
DU6-SU1	40.93511	-112.67206	4/10/2018	**30426**	1.66	**25.4**	517	0.92	116	31.4	0.44	196549	32.6	7.00	**11585**	34.9	**5.65**	36.3
DU6-SU2	40.9417	-112.58965	4/19/2018	**16662**	1.78	**41.0**	416	0.52	252	48.3	0.44	211824	17.7	4.05	**27110**	19.7	**3.66**	27.4
DU6-SU3	40.96256	-112.6661	4/15/2018	**15222**	1.56	**53.8**	388	0.48	392	52.5	0.29	195723	16.2	3.48	**39159**	30.0	**3.63**	27.5
DU6-SU4	40.96256	-112.61973	4/19/2018	**14662**	1.76	**47.9**	385	0.44	338	29.6	0.26	203483	15.3	3.58	**26107**	22.3	**3.49**	25.8
DU6-SU5	40.96256	-112.56884	4/21/2018	**14181**	1.65	**42.0**	454	0.45	328	61.3	0.19	227331	14.8	3.41	**36269**	17.6	**3.32**	28.9
DU6-SU6	41.0071	-112.65485	4/14/2018	**15992**	1.62	**48.4**	522	0.51	335	22.9	0.28	222988	17.0	3.70	**37757**	22.8	**4.10**	23.6
DU6-SU7	41.00098	-112.61876	5/20/2018	**14728**	1.69	**50.8**	383	0.44	328	32.7	0.29	215942	15.6	3.52	**40335**	16.8	**3.55**	29.3
DU6-SU8	40.99139	-112.56813	5/16/2018	**19479**	2.15	**42.5**	636	0.62	272	22.7	0.25	223302	21.2	4.44	**28884**	21.7	**4.62**	28.9
DU6-SU9	41.03587	-112.61894	6/7/2018	**13226**	1.67	**63.4**	443	0.41	450	35.5	0.15	193719	14.1	3.17	**57327**	19.5	**3.60**	27.7
DU6-SU10	41.03587	-112.58252	5/16/2018	**11374**	1.96	**81.0**	476	0.35	490	27.6	0.44	205634	12.2	2.84	**42247**	17.1	**3.45**	28.2
DU6-SU11	41.06589	-112.60074	6/2/2018	**10134**	1.78	**67.2**	485	0.30	423	33.8	0.25	207280	10.7	2.56	**56484**	14.6	**3.22**	23.0
DU7-SU1	40.94179	-112.71193	2/6/2018	**22485**	1.59	**25.8**	395	0.68	482	77.8	0.23	200245	22.4	5.59	**24719**	27.1	**4.70**	25.4
DU7-SU2	40.96245	-112.71972	2/8/2018	**13880**	1.20	**29.9**	374	0.46	537	72.7	0.19	213224	14.3	3.17	**37489**	24.4	**3.31**	21.7
DU7-SU3	40.98657	-112.76271	2/9/2018	**20497**	1.59	**30.2**	470	0.62	300	75.9	0.21	196136	21.4	4.85	**21499**	24.2	**4.44**	26.1
DU7-SU4	41.05341	-112.77378	2/17/2018	**22996**	1.29	**25.2**	422	0.67	208	77.8	0.33	181329	24.4	5.19	**24299**	25.0	**4.77**	31.3
DU7-SU5	40.99457	-112.80986	4/1/2018	**35166**	1.74	**25.8**	659	1.14	165	42.0	0.32	138942	36.1	7.00	**43388**	36.5	**6.77**	30.5
DU7-SU6	41.02789	-112.84425	2/17/2018	**43600**	1.83	**27.4**	599	1.34	200	110.8	0.38	114255	45.1	8.84	**33597**	45.1	**8.07**	31.2
DU7-SU7	41.05451	-112.8084	2/17/2018	**32495**	2.41	**38.4**	489	1.02	243	62.0	0.50	151871	34.5	7.58	**17591**	34.6	**6.48**	37.5
DU7-UTTR	41.12974	-112.80566	6/5/2018	**39215**	1.65	**24.1**	580	1.15	149	47.5	0.50	141129	42.7	7.81	**35544**	41.2	**7.44**	29.7
DU7-SU10	41.20507	-112.83053	4/3/2018	**23453**	1.97	**44.3**	505	0.71	435	36.4	0.37	179386	25.8	5.69	**36615**	28.1	**5.04**	35.3

[1] - EPA Regional Screening Levels (May 2016) for residential and industrial properties (TR=1E-06, THQ=0.1) cited.

NE - Not Established

BOLD - exceeds the most conservative residential and industrial screening levels.

*Chromium III RSL values cited.

TABLE A1.3

RESUSPENDED SOIL (PM10) ANALYTICAL RESULTS SUMMARY - ELEMENTS (A - C)

DU8 through DU10

Results in milligrams per kilogram (mg/kg-dry)

Sample Name	Latitude	Longitude	Sample Date	Aluminum	Antimony	Arsenic	Barium	Beryllium	Boron	Bromine	Cadmium	Calcium	Cerium	Cesium	Chlorine	Chromium	Cobalt	Copper
		[1]Screening Levels	*Residential RSLs*	*7740*	*3.1*	*0.68*	*1,530*	*16*	*1,560*	*NE*	*7.1*	*NE*	*NE*	*NE*	*NE*	*11,700**	*2.3*	*313*
			Industrial RSLs	*112,000*	*47*	*3.0*	*21,700*	*229*	*23,300*	*NE*	*98*	*NE*	*NE*	*NE*	*NE*	*175,000**	*35*	*4,670*
DU8-SU1	41.10304	-112.24551	10/24/2017	22590	2.25	**50.1**	344	0.68	551	141.1	0.30	152644	24.4	7.27	95019	46.0	4.41	31.8
DU8-SU2	41.10304	-112.18009	12/22/2017	34618	2.42	**29.5**	433	1.07	183	62.4	1.10	142809	30.9	13.38	28014	37.1	5.49	34.4
DU8-SU3	41.15494	-112.31378	10/29/2017	27012	3.49	**67.4**	611	0.87	497	67.6	0.49	147473	22.7	7.09	42440	35.0	8.39	39.3
DU8-SU4	41.21984	-112.29187	5/24/2018	34314	2.10	**26.5**	363	1.03	231	38.9	0.31	152971	34.9	12.77	59227	38.6	6.25	32.2
DU8-SU5	41.13822	-112.20025	12/2/2017	51818	4.58	**25.5**	461	1.60	257	37.8	0.75	109580	48.8	15.01	38964	55.3	8.43	56.8
DU8-SU6	41.22436	-112.25495	5/22/2018	47635	4.77	**37.9**	394	1.44	395	48.4	0.46	68061	49.5	13.95	38722	50.5	8.23	50.0
DU9-SU1	41.24013	-112.85881	8/8/2018	20802	3.02	**40.2**	375	0.63	435	34.4	0.25	196803	21.3	5.15	36326	24.7	4.44	28.6
DU9-SU2	41.28429	-112.8848	8/7/2018	13327	2.33	**26.9**	503	0.33	485	73.1	0.20	133913	9.1	1.94	61240	11.1	2.29	15.2
DU9-SU3	41.32139	-112.92682	8/7/2018	10681	2.17	**28.1**	271	0.31	482	104.8	0.58	150192	10.3	2.47	114188	60.9	2.20	17.2
DU9-SU4	41.37304	-112.95394	7/1/2018	43910	1.38	**18.1**	544	1.38	164	317.0	0.47	149463	52.7	13.74	409888	49.0	7.45	25.3
DU9-SU5	41.37514	-112.99337	5/18/2018	17529	3.09	**51.0**	369	0.52	466	62.6	0.31	240085	17.6	4.00	58957	19.6	3.78	28.5
DU9-SU6	41.44428	-112.99873	7/3/2018	14963	2.56	**42.3**	346	0.44	433	42.5	0.18	232350	15.0	3.46	43185	17.1	3.28	24.8
DU9-SU7	41.44668	-112.96344	7/14/2018	9086	1.89	**33.5**	238	0.28	426	47.7	0.20	231476	9.1	2.06	58929	15.9	2.14	19.3
DU9-SU8	41.48131	-113.04297	7/3/2018	20847	2.91	**44.0**	427	0.66	469	77.6	0.28	155501	21.5	4.29	35509	25.5	4.47	24.4
DU9-SU9	41.52268	-112.96429	7/14/2018	8815	1.96	**31.7**	341	0.28	432	63.5	0.20	210418	8.8	1.90	73607	18.0	2.19	18.3
DU9-SU10	41.5214	-112.99844	7/6/2018	13245	2.82	**45.0**	378	0.38	604	46.8	0.17	230598	12.9	2.97	45533	16.0	3.04	22.3
DU9-SU11	41.53881	-113.06245	7/6/2018	21030	2.33	**40.9**	527	0.65	423	48.1	0.28	168521	21.3	4.47	53102	31.6	4.61	21.7
DU9-SU12	41.57511	-112.94772	7/10/2018	10459	2.62	**41.5**	304	0.33	384	42.7	0.19	203159	10.4	2.41	42690	16.1	2.43	20.0
DU9-SU13	41.59301	-112.99806	7/18/2018	15906	2.76	**42.0**	449	0.50	402	45.4	0.24	215751	15.7	3.66	42862	20.4	3.58	20.8
DU9-SU14	41.59301	-113.04626	7/20/2018	46797	1.80	**21.9**	476	1.44	170	35.2	0.48	140572	51.0	20.20	30808	52.1	7.45	25.8
DU9-SU15	41.59301	-113.09327	7/20/2018	36235	2.08	**36.3**	547	1.18	291	43.5	0.40	118325	37.0	7.35	39662	41.6	6.47	23.9
DU9-SU16	41.65615	-112.90238	7/7/2018	15911	1.82	**36.8**	314	0.50	390	48.2	0.32	198921	15.8	4.28	30997	22.3	3.62	18.4
DU9-SU17	41.6295	-112.95021	7/10/2018	17513	2.72	**43.7**	439	0.55	456	42.5	0.17	234165	17.2	4.31	32833	21.7	4.01	23.2
DU9-SU18	41.66467	-112.99832	7/21/2018	34094	1.96	**38.4**	530	1.06	422	44.1	0.30	137025	35.2	7.79	40047	42.2	6.14	23.6
DU9-SU19	41.66467	-113.04671	7/23/2018	38469	2.00	**46.2**	571	1.23	376	45.8	0.20	101886	38.5	8.74	61687	44.1	6.78	24.8
DU9-SU20	41.66467	-113.09305	8/4/2018	49175	1.72	**26.0**	573	1.54	254	41.3	0.45	133489	53.8	15.52	42789	55.8	8.22	26.9
DU9-SU21	41.69225	-113.13276	8/5/2018	57890	1.42	**16.2**	556	1.77	101	31.8	0.43	126295	62.8	27.65	32680	64.0	9.08	28.0
DU9-SU22	41.7176	-113.06916	8/5/2018	61686	1.45	**19.0**	560	1.90	139	19.1	0.65	105711	69.6	11.12	24154	65.6	9.61	27.8
DU9-SU23	41.74901	-112.99046	7/16/2018	57515	1.48	**20.2**	527	1.84	203	21.2	0.60	89973	61.9	10.04	25388	62.9	8.90	28.1
DU10-SU1	41.20439	-112.45391	5/6/2017	22996	2.19	**46.0**	381	0.86	525	78.5	0.29	187943	28.7	6.52	48616	40.3	6.27	46.7
DU10-SU2	41.25124	-112.50709	5/7/2017	36499	4.64	**68.0**	410	1.31	401	57.6	0.27	168469	44.4	8.46	40966	51.8	8.90	34.0
DU10-SU3	41.30465	-112.5105	2/4/2018	21168	3.05	**51.2**	671	0.63	301	61.2	0.23	238492	20.7	4.13	40178	30.2	5.29	18.6
DU10-SU4	41.38096	-112.54783	7/22/2017	13465	2.12	**38.7**	379	0.39	402	92.3	0.20	225045	13.0	2.58	78745	39.2	3.40	21.2
DU10-SU5	41.43142	-112.56648	7/24/2017	15934	1.73	**26.2**	292	0.48	336	61.0	0.10	235343	16.2	3.06	53287	30.1	3.40	21.7
DU10-SU6	41.45664	-112.59062	5/22/2017	14737	4.26	**40.2**	283	0.68	217	21.8	0.27	189398	21.9	7.30	26296	26.4	4.36	26.3
DU10-SU7	41.42856	-112.62285	5/22/2017	12870	2.28	**41.5**	294	0.60	322	22.2	0.15	222647	19.8	3.82	27647	25.6	4.02	28.0
DU10-SU8	41.46849	-112.72485	5/20/2017	20161	2.99	**54.7**	343	0.97	230	27.7	0.18	181802	32.3	6.06	21218	34.2	5.35	27.7
DU10-SU9	41.54727	-112.79302	7/11/2018	21906	2.62	**44.2**	297	0.71	451	22.5	0.20	187632	22.1	4.47	41234	32.0	4.59	22.0
DU10-SU10	41.6092	-112.77721	7/13/2018	20038	2.66	**46.5**	352	0.61	411	22.4	0.20	231184	20.2	3.79	35870	24.6	4.46	30.7
DU10-SU11	41.64667	-112.76641	7/8/2018	15940	2.23	**42.2**	386	0.48	388	29.2	0.20	251483	15.7	3.67	28671	20.8	3.56	19.1
DU10-SU12	41.68228	-112.75655	7/2/2018	25714	1.74	**38.1**	280	0.80	332	48.7	0.30	194674	25.8	6.59	38758	31.1	4.94	25.4
DU10-SU13	41.70729	-112.78171	12/9/2017	40656	1.48	**35.0**	383	1.25	290	85.1	0.32	132519	41.6	10.13	32827	48.3	6.53	24.0
DU10-SU14	41.68538	-112.80629	10/18/2017	23026	1.76	**32.8**	369	0.70	425	90.3	0.15	177311	23.2	4.82	61865	38.4	4.39	26.6
DU10-SU15	41.67995	-112.85396	7/30/2017	25069	3.64	**45.5**	366	0.78	450	104.2	0.15	185492	25.5	5.42	52725	35.2	5.03	49.2

[1] - EPA Regional Screening Levels (May 2016) for residential and industrial properties (TR=1E-06, THQ=0.1) cited.

NE - Not Established

BOLD - exceeds the most conservative residential and industrial screening levels.

*Chromium III RSL values cited.

TABLE A2.1

RESUSPENDED SOIL (PM10) ANALYTICAL RESULTS SUMMARY - ELEMENTS (D - M)

DU1 through DU4

Results in milligrams per kilogram (mg/kg-dry)

Sample Name	Latitude	Longitude	Sample Date	Dysprosium	Erbium	Europium	Gallium	Gadolinium	Holmium	Iron	Lanthanum	Lead	Lithium	Lutetium	Magnesium	Manganese	Molybdenum
		[1]Screening Levels	*Residential RSLs*	*NE*	*NE*	*NE*	*NE*	*NE*	*NE*	*5,480*	*0.39*	*400*	*16*	*NE*	*NE*	*183*	*39*
			Industrial RSLs	*NE*	*NE*	*NE*	*NE*	*NE*	*NE*	*81,800*	*5.8*	*800*	*234*	*NE*	*NE*	*2,560*	*584*
DU1-SU1	40.68191	-112.33737	6/16/2016	0.44	0.27	0.13	13.9	0.51	0.10	2808	3.4	24.4	71.9	0.04	28039	138	3.52
DU1-SU2	40.70134	-112.28841	6/18/2016	0.45	0.27	0.13	22.2	0.52	0.10	2912	3.7	16.3	62.4	0.04	32869	134	4.31
DU1-SU3	40.72007	-112.24714	6/19/2016	0.49	0.28	0.16	18.9	0.58	0.10	3171	**7.1**	21.7	62.2	0.04	42538	152	9.70
DU1-SU4	40.75307	-112.18496	6/21/2016	0.96	0.52	0.35	16.4	1.28	0.19	6446	**11.3**	37.3	70.9	0.07	30270	580	8.20
DU1-SU5	40.77443	-112.16576	7/1/2016	1.47	0.82	0.46	20.5	1.81	0.30	9966	**13.9**	57.3	133.9	0.11	61668	1195	13.40
DU1-SU6	40.79201	-112.14101	7/19/2016	1.66	0.95	0.51	18.0	2.10	0.35	12945	**15.7**	48.5	95.8	0.13	48017	643	6.56
DU1-SU7	40.81083	-112.14437	7/20/2016	2.06	1.20	0.62	29.6	2.55	0.43	17181	**19.3**	64.8	109.2	0.16	49936	601	7.58
DU2-SU1	40.8393	-112.14633	7/4/2016	1.91	1.11	0.54	22.4	2.32	0.39	13721	**16.8**	53.7	96.0	0.15	54068	552	4.65
DU2-SU2	40.86485	-112.13326	7/21/2016	1.43	0.83	0.39	28.7	1.65	0.30	9123	**12.3**	75.3	86.3	0.12	56335	393	4.78
DU2-SU3	40.89587	-112.09879	7/7/2016	0.76	0.44	0.24	11.4	0.93	0.16	4528	**6.3**	41.5	58.9	0.06	34097	283	4.05
DU2-SU4	40.89235	-112.1451	9/4/2016	1.58	0.91	0.41	31.1	1.78	0.31	11549	**12.7**	71.0	94.7	0.02	55877	476	4.34
DU2-SU5	40.92829	-112.14442	11/13/2016	2.04	1.15	0.50	34.7	2.23	0.40	15345	**15.3**	66.5	102.4	0.03	60863	553	3.56
DU2-SU6	40.92275	-112.11042	9/8/2016	0.90	0.51	0.29	16.6	1.14	0.19	6311	**8.0**	51.1	78.5	0.01	42338	394	9.42
DU2-SU7	40.9639	-112.14846	11/15/2016	1.84	1.06	0.45	21.8	2.02	0.36	12124	**13.0**	46.9	94.5	0.02	59806	538	5.54
DU2-SU8	40.99807	-112.17333	11/20/2016	2.33	1.30	0.63	29.0	2.56	0.46	15162	**17.5**	39.0	109.9	0.03	65773	680	10.61
DU2-SU9	41.04297	-112.1963	11/16/2016	0.97	0.55	0.31	11.9	1.10	0.19	5697	**7.9**	34.6	67.6	0.01	51388	480	12.18
DU2-SU10	41.0484	-112.25678	11/26/2016	1.15	0.66	0.35	14.1	1.33	0.22	7156	**9.7**	25.3	75.9	0.02	57076	471	3.17
DU2-SU11	41.02334	-112.26201	11/26/2016	1.32	0.77	0.38	15.6	1.50	0.26	6958	**10.9**	28.9	79.6	0.02	47178	469	1.54
DU2-SU12	40.98318	-112.25411	2/16/2017	1.61	0.95	0.43	16.5	1.78	0.31	8862	**12.6**	36.7	63.7	0.02	43319	552	2.29
DU2-SU13	40.91004	-112.23384	3/5/2017	2.62	1.51	0.56	34.2	2.67	0.49	14872	**17.1**	32.3	65.6	0.03	40793	654	3.51
DU2-SU14	40.85375	-112.19491	3/3/2017	2.36	1.33	0.61	21.2	2.86	0.46	12466	**18.8**	51.4	77.1	0.19	42488	704	3.15
DU3-SU1	40.93069	-112.05908	7/23/2016	1.18	0.69	0.33	13.1	1.43	0.25	8119	**10.1**	52.7	89.4	0.10	46608	456	7.02
DU3-SU2	40.96349	-112.0495	7/25/2016	1.39	0.78	0.37	18.0	1.61	0.29	8403	**11.6**	66.4	82.5	0.11	49341	433	3.62
DU3-SU3	40.96497	-112.08526	6/17/2017	1.99	1.12	0.55	42.2	2.23	0.38	12841	**16.4**	74.2	124.4	0.15	62355	685	3.26
DU3-SU4	40.96507	-112.00103	8/18/2017	1.69	0.93	0.47	24.3	2.00	0.32	13291	**14.5**	81.3	147.3	0.13	69789	616	4.37
DU3-SU5	40.99296	-112.00573	8/24/2017	1.55	0.86	0.43	23.2	1.82	0.31	12204	**13.4**	130.6	152.2	0.11	82497	565	3.02
DU3-SU6	40.99443	-112.04754	8/26/2017	1.49	0.83	0.40	20.2	1.73	0.28	11639	**12.3**	83.9	150.8	0.11	75275	547	2.63
DU3-SU7	40.99924	-112.09302	6/17/2017	1.83	1.04	0.52	29.6	2.13	0.35	12870	**16.0**	114.7	122.9	0.14	72793	721	3.23
DU3-SU8	41.03318	-112.10444	6/1/2017	1.55	0.86	0.42	19.5	1.77	0.29	10575	**12.8**	100.6	107.1	0.12	63760	554	2.41
DU3-SU9	41.06211	-112.12781	6/1/2017	1.63	0.95	0.44	20.5	1.95	0.31	12422	**14.4**	85.2	109.5	0.13	61590	585	2.28
DU3-SU10	41.08389	-112.1512	6/1/2017	1.91	1.05	0.51	23.1	2.14	0.38	14062	**16.2**	87.6	116.1	0.15	65333	610	2.40
DU4-SU1	40.68222	-112.3875	4/16/2017	1.39	0.81	0.40	32.6	1.55	0.27	10892	**11.5**	56.6	107.0	0.02	62979	426	2.42
DU4-SU2	40.71437	-112.39241	4/30/2017	0.89	0.53	0.26	53.1	0.98	0.18	7051	**7.2**	34.9	**465.4**	0.01	108648	298	4.81
DU4-SU3	40.74182	-112.38983	4/23/2017	1.29	0.75	0.36	37.9	1.45	0.24	8296	**10.8**	69.2	106.2	0.02	62909	407	3.03
DU4-SU4	40.70033	-112.4299	4/24/2018	1.79	1.01	0.49	24.2	2.01	0.35	13315	**14.6**	31.5	166.9	0.14	67030	475	4.21
DU4-SU5	40.71264	-112.47004	5/26/2017	2.20	1.27	0.56	24.4	2.47	0.44	10849	**18.8**	25.8	151.8	0.18	68372	428	1.16
DU4-SU6	40.74093	-112.41941	4/25/2018	1.09	0.62	0.28	17.1	1.21	0.21	8207	**8.7**	34.9	129.4	0.09	56383	351	1.67
DU4-SU7	40.74093	-112.44395	4/26/2018	1.28	0.73	0.34	21.9	1.40	0.25	9483	**10.0**	32.0	144.5	0.11	66996	374	1.36
DU4-SU8	40.75037	-112.47583	4/28/2018	1.27	0.73	0.32	17.3	1.39	0.25	9867	**10.2**	25.2	182.9	0.10	85066	352	1.02
DU4-SU9	40.78799	-112.43606	5/1/2017	1.37	0.79	0.38	53.9	1.58	0.27	10620	**11.6**	42.2	104.5	0.02	64292	414	2.49
DU4-SU10	40.78045	-112.47128	6/14/2017	1.51	0.88	0.40	18.5	1.63	0.30	11276	**12.1**	28.5	173.1	0.13	75157	429	1.67
DU4-SU11	40.81846	-112.45451	6/14/2017	1.52	0.87	0.42	32.6	1.73	0.30	10044	**12.5**	28.9	99.2	0.12	54470	408	1.59
DU4-SU12	40.88364	-112.48194	5/14/2017	1.45	0.83	0.40	91.0	1.66	0.29	11432	**12.3**	22.6	110.4	0.02	65111	481	4.65
DU4-SU13	40.9153	-112.52553	5/15/2017	2.08	1.20	0.58	66.3	2.44	0.41	15312	**18.2**	34.3	101.7	0.03	53167	497	2.78

[1] - EPA Regional Screening Levels (May 2016) for residential and industrial properties (TR=1E-06, THQ=0.1) cited.

NE - Not Established

BOLD - exceeds the most conservative residential and industrial screening levels.

TABLE A2.2

RESUSPENDED SOIL (PM10) ANALYTICAL RESULTS SUMMARY - ELEMENTS (D - M)

DU5 through DU7

Results in milligrams per kilogram (mg/kg-dry)

Sample Name	Latitude	Longitude	Sample Date	Dysprosium	Erbium	Europium	Gallium	Gadolinium	Holmium	Iron	Lanthanum	Lead	Lithium	Lutetium	Magnesium	Manganese	Molybdenum
		[1] Screening Levels	*Residential RSLs*	*NE*	*NE*	*NE*	*NE*	*NE*	*NE*	*5,480*	*0.39*	*400*	*16*	*NE*	*NE*	*183*	*39*
			Industrial RSLs	*NE*	*NE*	*NE*	*NE*	*NE*	*NE*	*81,800*	*5.8*	*800*	*234*	*NE*	*NE*	*2,560*	*584*
DU5-SU1	41.28562	-112.37845	6/4/2018	2.51	1.38	0.65	28.0	2.87	0.48	20002	**21.2**	29.8	175.4	0.19	60208	671	2.11
DU5-SU2	41.32209	-112.39388	6/4/2018	2.70	1.53	0.71	23.8	3.10	0.52	20829	**23.1**	39.9	169.9	0.21	55648	664	1.25
DU5-SU3	41.35859	-112.40339	5/30/2018	3.14	1.77	0.83	22.7	3.64	0.61	23793	**27.1**	34.0	186.7	0.24	61323	663	0.93
DU5-SU4	41.39312	-112.29923	6/25/2018	3.01	1.70	0.79	22.4	3.48	0.60	20926	**25.9**	24.3	125.8	0.23	43198	526	1.01
DU5-SU5	41.39725	-112.39648	5/30/2018	3.14	1.73	0.80	22.1	3.64	0.60	25201	**27.2**	33.7	196.2	0.24	64420	699	0.95
DU5-SU6	41.49835	-112.37112	6/17/2018	3.78	2.10	0.99	25.9	4.37	0.73	26667	**33.4**	25.0	195.0	0.29	56830	589	0.72
DU5-SU7	41.45972	-112.42171	6/8/2018	3.74	2.11	0.99	22.0	4.38	0.72	27331	**33.3**	31.8	200.4	0.29	58517	594	0.71
DU5-SU8	41.50292	-112.42205	6/10/2018	4.06	2.22	1.06	27.3	4.62	0.77	26928	**35.4**	24.8	196.3	0.30	57452	610	0.88
DU5-SU9	41.53919	-112.42205	6/26/2018	4.47	2.49	1.15	23.3	5.19	0.86	28943	**39.0**	22.0	138.8	0.34	38013	655	1.11
DU5-SU10	41.53919	-112.36969	6/17/2018	4.32	2.36	1.10	26.1	4.99	0.81	28941	**37.9**	22.1	180.1	0.32	44011	665	0.93
DU5-SU11	41.52274	-112.3178	6/15/2018	3.58	1.98	0.94	25.1	4.19	0.68	28362	**31.8**	24.0	208.3	0.27	64451	618	0.67
DU5-SU12	41.57428	-112.41513	6/12/2018	4.51	2.52	1.17	23.9	5.22	0.87	28408	**39.6**	22.6	126.7	0.34	31880	747	1.13
DU5-SU13	41.57428	-112.36886	6/16/2018	3.88	2.17	1.02	22.1	4.54	0.74	24979	**34.3**	19.9	143.1	0.29	27849	695	1.04
DU5-BRBR	41.44494	-112.30394	6/14/2018	3.35	1.89	0.84	43.6	3.84	0.64	29154	**28.5**	22.8	64.8	0.26	20196	629	0.72
DU6-SU1	40.93511	-112.67206	4/10/2018	2.07	1.17	0.55	18.2	2.31	0.40	16015	**17.0**	28.7	130.8	0.16	50248	461	2.63
DU6-SU2	40.9417	-112.58965	4/19/2018	1.12	0.63	0.32	14.4	1.23	0.22	8543	**9.2**	20.4	121.8	0.09	48829	276	1.95
DU6-SU3	40.96256	-112.6661	4/15/2018	1.01	0.60	0.29	13.2	1.11	0.20	6901	**9.1**	19.4	105.7	0.08	56104	288	2.91
DU6-SU4	40.96256	-112.61973	4/19/2018	0.95	0.55	0.27	20.3	1.08	0.18	6582	**8.1**	17.8	109.6	0.08	52670	265	2.09
DU6-SU5	40.96256	-112.56884	4/21/2018	0.91	0.54	0.27	14.7	1.06	0.18	6288	**7.7**	19.8	100.0	0.08	50832	271	1.60
DU6-SU6	41.0071	-112.65485	4/14/2018	1.06	0.60	0.31	27.3	1.23	0.20	7401	**9.4**	16.3	90.9	0.08	46299	388	2.54
DU6-SU7	41.00098	-112.61876	5/20/2018	0.95	0.55	0.27	23.7	1.08	0.19	7475	**8.4**	18.2	86.8	0.08	51032	301	2.23
DU6-SU8	40.99139	-112.56813	5/16/2018	1.30	0.74	0.39	31.2	1.53	0.25	10483	**10.9**	21.7	126.2	0.11	54081	422	2.05
DU6-SU9	41.03587	-112.61894	6/7/2018	0.86	0.49	0.26	29.0	0.99	0.16	6162	**7.7**	16.9	93.2	0.07	53711	294	2.66
DU6-SU10	41.03587	-112.58252	5/16/2018	0.76	0.44	0.23	23.2	0.88	0.16	5300	**6.4**	20.7	87.1	0.08	57322	284	2.71
DU6-SU11	41.06589	-112.60074	6/2/2018	0.65	0.36	0.22	25.6	0.73	0.12	4517	5.7	16.2	96.2	0.06	53796	252	2.76
DU7-SU1	40.94179	-112.71193	2/6/2018	1.40	0.77	0.37	23.6	1.56	0.26	12124	**12.2**	15.1	142.6	0.11	51817	350	2.18
DU7-SU2	40.96245	-112.71972	2/8/2018	0.93	0.53	0.26	21.2	1.01	0.18	7740	**7.7**	13.7	141.3	0.07	47551	266	1.21
DU7-SU3	40.98657	-112.76271	2/9/2018	1.32	0.77	0.36	21.2	1.52	0.26	8926	**11.0**	18.5	140.8	0.11	64351	346	1.25
DU7-SU4	41.05341	-112.77378	2/17/2018	1.59	0.90	0.41	28.1	1.74	0.30	11423	**12.6**	20.0	138.2	0.13	58274	423	1.22
DU7-SU5	40.99457	-112.80986	4/1/2018	2.19	1.24	0.60	35.8	2.50	0.43	17218	**18.7**	14.7	188.8	0.17	77248	476	2.24
DU7-SU6	41.02789	-112.84425	2/17/2018	2.76	1.54	0.72	49.6	3.15	0.53	22142	**23.3**	16.8	208.8	0.21	70051	521	2.38
DU7-SU7	41.05451	-112.8084	2/17/2018	2.16	1.26	0.57	28.8	2.48	0.43	16977	**17.5**	20.2	196.3	0.18	82966	487	2.18
DU7-UTTR	41.12974	-112.80566	6/5/2018	2.61	1.48	0.70	32.8	3.02	0.51	18696	**21.9**	21.1	174.3	0.20	69436	545	1.97
DU7-SU10	41.20507	-112.83053	4/3/2018	1.67	0.94	0.44	29.3	1.88	0.33	12369	**13.2**	25.1	154.2	0.13	68278	439	2.35

[1] - EPA Regional Screening Levels (May 2016) for residential and industrial properties (TR=1E-06, THQ=0.1) cited.

NE - Not Established

BOLD - exceeds the most conservative residential and industrial screening levels.

TABLE A2.3

RESUSPENDED SOIL (PM10) ANALYTICAL RESULTS SUMMARY - ELEMENTS (D - M)

DU8 through DU10

Results in milligrams per kilogram (mg/kg-dry)

Sample Name	Latitude	Longitude	Sample Date	Dysprosium	Erbium	Europium	Gallium	Gadolinium	Holmium	Iron	Lanthanum	Lead	Lithium	Lutetium	Magnesium	Manganese	Molybdenum
		[1]Screening Levels	*Residential RSLs*	*NE*	*NE*	*NE*	*NE*	*NE*	*NE*	*5,480*	*0.39*	*400*	*16*	*NE*	*NE*	*183*	*39*
			Industrial RSLs	*NE*	*NE*	*NE*	*NE*	*NE*	*NE*	*81,800*	*5.8*	*800*	*234*	*NE*	*NE*	*2,560*	*584*
DU8-SU1	41.10304	-112.24551	10/24/2017	1.51	0.83	0.39	25.1	1.70	0.29	11866	**12.7**	23.1	137.8	0.12	59332	511	3.95
DU8-SU2	41.10304	-112.18009	12/22/2017	1.89	1.04	0.51	22.8	2.19	0.37	17794	**16.4**	47.0	143.6	0.14	55962	559	3.75
DU8-SU3	41.15494	-112.31378	10/29/2017	1.48	0.83	0.42	24.1	1.64	0.29	18312	**11.5**	32.5	170.8	0.12	65225	712	3.42
DU8-SU4	41.21984	-112.29187	5/24/2018	2.16	1.21	0.57	45.3	2.51	0.42	17555	**18.3**	30.7	160.6	0.16	53413	584	2.26
DU8-SU5	41.13822	-112.20025	12/2/2017	3.05	1.72	0.81	43.7	3.59	0.59	27019	**25.8**	73.3	181.5	0.23	56935	793	1.58
DU8-SU6	41.22436	-112.25495	5/22/2018	3.10	1.73	0.80	35.8	3.52	0.60	24219	**26.1**	44.3	213.8	0.23	79915	780	1.83
DU9-SU1	41.24013	-112.85881	8/8/2018	1.30	0.76	0.35	33.8	1.51	0.26	9700	**11.0**	17.5	158.8	0.11	69461	342	3.13
DU9-SU2	41.28429	-112.8848	8/7/2018	0.55	0.32	0.20	28.2	0.65	0.11	4324	4.5	6.5	**259.4**	0.05	80321	133	2.65
DU9-SU3	41.32139	-112.92682	8/7/2018	0.66	0.36	0.20	27.7	0.77	0.12	4782	5.4	9.3	208.3	0.05	72845	146	5.89
DU9-SU4	41.37304	-112.95394	7/1/2018	3.26	1.87	0.79	168.7	3.69	0.64	22047	**27.2**	15.1	213.7	0.25	41557	511	2.16
DU9-SU5	41.37514	-112.99337	5/18/2018	1.14	0.65	0.30	45.1	1.26	0.22	8947	**9.1**	18.7	151.3	0.09	60879	255	1.84
DU9-SU6	41.44428	-112.99873	7/3/2018	0.94	0.53	0.25	35.8	1.02	0.19	7581	**7.7**	15.0	186.4	0.08	71507	209	1.67
DU9-SU7	41.44668	-112.96344	7/14/2018	0.56	0.32	0.16	27.2	0.62	0.11	4133	4.7	8.8	118.1	0.04	46360	124	2.72
DU9-SU8	41.48131	-113.04297	7/3/2018	1.36	0.77	0.37	26.8	1.51	0.26	10656	**11.1**	14.0	**258.3**	0.11	111007	333	1.66
DU9-SU9	41.52268	-112.96429	7/14/2018	0.56	0.33	0.17	22.6	0.63	0.11	3927	4.5	7.9	124.0	0.04	51704	126	5.42
DU9-SU10	41.5214	-112.99844	7/6/2018	0.81	0.46	0.22	29.2	0.91	0.16	5873	**6.6**	13.5	158.3	0.07	59412	196	5.87
DU9-SU11	41.53881	-113.06245	7/6/2018	1.35	0.73	0.36	36.2	1.52	0.26	10405	**10.9**	16.2	210.1	0.11	98208	336	1.40
DU9-SU12	41.57511	-112.94772	7/10/2018	0.65	0.37	0.18	21.1	0.76	0.12	4456	5.3	10.0	125.6	0.06	54231	143	7.10
DU9-SU13	41.59301	-112.99806	7/18/2018	1.02	0.57	0.27	31.5	1.07	0.19	7040	**8.0**	12.2	173.5	0.09	66490	238	4.63
DU9-SU14	41.59301	-113.04626	7/20/2018	3.15	1.76	0.80	45.2	3.60	0.61	23979	**26.7**	15.4	223.6	0.23	40750	464	2.66
DU9-SU15	41.59301	-113.09327	7/20/2018	2.34	1.31	0.58	36.8	2.64	0.47	18059	**19.2**	12.5	**233.8**	0.19	94641	469	1.71
DU9-SU16	41.65615	-112.90238	7/7/2018	1.01	0.58	0.26	21.6	1.10	0.20	7232	**8.1**	13.9	160.2	0.08	68463	316	1.42
DU9-SU17	41.6295	-112.95021	7/10/2018	1.07	0.61	0.29	25.4	1.21	0.21	7745	**8.7**	13.8	173.3	0.09	69970	312	3.22
DU9-SU18	41.66467	-112.99832	7/21/2018	2.16	1.23	0.55	34.4	2.48	0.42	14462	**18.2**	13.8	193.7	0.17	90254	430	1.57
DU9-SU19	41.66467	-113.04671	7/23/2018	2.36	1.36	0.60	43.7	2.65	0.47	18801	**20.0**	14.2	213.3	0.19	98513	461	1.13
DU9-SU20	41.66467	-113.09305	8/4/2018	3.34	1.86	0.82	41.8	3.82	0.65	24871	**28.0**	15.2	**269.1**	0.25	67036	557	1.84
DU9-SU21	41.69225	-113.13276	8/5/2018	3.81	2.14	0.96	39.3	4.32	0.74	28945	**32.6**	17.5	218.5	0.29	28849	582	2.52
DU9-SU22	41.7176	-113.06916	8/5/2018	4.35	2.45	1.02	34.7	4.84	0.83	30384	**35.9**	18.2	217.6	0.32	44883	642	1.94
DU9-SU23	41.74901	-112.99046	7/16/2018	3.83	2.20	0.93	32.6	4.31	0.74	28017	**32.2**	17.6	231.1	0.29	62422	586	1.66
DU10-SU1	41.20439	-112.45391	5/6/2017	1.77	1.02	0.48	36.2	2.02	0.36	15143	**14.8**	28.8	189.9	0.02	72638	654	2.34
DU10-SU2	41.25124	-112.50709	5/7/2017	2.66	1.47	0.72	55.6	3.07	0.51	22598	**22.8**	18.5	143.6	0.03	61849	663	3.67
DU10-SU3	41.30465	-112.5105	2/4/2018	1.29	0.71	0.38	24.7	1.47	0.24	10331	**10.5**	11.3	140.6	0.10	60846	359	1.28
DU10-SU4	41.38096	-112.54783	7/22/2017	0.82	0.49	0.23	17.5	0.92	0.16	5713	**6.6**	8.9	122.3	0.07	57195	216	3.24
DU10-SU5	41.43142	-112.56648	7/24/2017	1.00	0.59	0.28	17.7	1.13	0.20	6499	**8.2**	15.1	119.2	0.08	52069	281	1.23
DU10-SU6	41.45664	-112.59062	5/22/2017	1.34	0.78	0.35	41.4	1.54	0.27	9643	**11.3**	21.4	121.7	0.11	67577	375	1.00
DU10-SU7	41.42856	-112.62285	5/22/2017	1.18	0.67	0.32	27.0	1.36	0.23	8101	**10.2**	17.0	95.2	0.10	46716	282	1.37
DU10-SU8	41.46849	-112.72485	5/20/2017	2.06	1.15	0.52	24.5	2.31	0.39	12903	**16.5**	14.6	131.9	0.16	53931	461	1.79
DU10-SU9	41.54727	-112.79302	7/11/2018	1.35	0.78	0.36	31.1	1.64	0.27	10242	**11.3**	11.2	157.5	0.10	59633	413	2.11
DU10-SU10	41.6092	-112.77721	7/13/2018	1.25	0.69	0.34	29.4	1.47	0.24	8531	**10.2**	13.2	128.8	0.10	56208	336	1.50
DU10-SU11	41.64667	-112.76641	7/8/2018	0.95	0.56	0.27	24.3	1.08	0.19	6891	**8.0**	11.3	131.9	0.08	57095	290	1.91
DU10-SU12	41.68228	-112.75655	7/2/2018	1.58	0.95	0.39	31.5	1.79	0.30	12021	**13.5**	15.1	179.4	0.12	75732	398	0.95
DU10-SU13	41.70729	-112.78171	12/9/2017	2.61	1.48	0.65	32.9	2.94	0.51	19855	**21.4**	15.3	213.6	0.20	82116	508	0.88
DU10-SU14	41.68538	-112.80629	10/18/2017	1.47	0.85	0.38	20.2	1.64	0.29	11311	**11.9**	10.8	190.2	0.12	81513	350	1.52
DU10-SU15	41.67995	-112.85396	7/30/2017	1.55	0.89	0.40	29.3	1.78	0.31	12858	**13.0**	33.9	190.3	0.12	73877	407	2.06

[1] - EPA Regional Screening Levels (May 2016) for residential and industrial properties (TR=1E-06, THQ=0.1) cited.

NE - Not Established

BOLD - exceeds the most conservative residential and industrial screening levels.

TABLE A3.1

RESUSPENDED SOIL (PM10) ANALYTICAL RESULTS SUMMARY - ELEMENTS (N - S)

DU1 through DU4

Results in milligrams per kilogram (mg/kg-dry)

Sample Name	Latitude	Longitude	Sample Date	Neodymium	Nickel	Phosphorus	Potassium	Praseodymium	Rubidium	Samarium	Scandium	Selenium	Silicon	Silver	Sodium	Strontium	Sulfur
		[1] *Screening Levels*	*Residential RSLs*	*NE*	*83*	*NE*	*NE*	*NE*	*NE*	*NE*	*NE*	*39*	*NE*	*39*	*NE*	*4,690*	*NE*
			Industrial RSLs	*NE*	*1160*	*NE*	*NE*	*NE*	*NE*	*NE*	*NE*	*584*	*NE*	*584*	*NE*	*70,100*	*NE*
DU1-SU1	40.68191	-112.33737	6/16/2016	2.87	56.1	398.2	5190	0.78	16.1	0.57	0.83	0.38	16551	0.13	110767	1567	62051
DU1-SU2	40.70134	-112.28841	6/18/2016	3.17	36.3	174.3	7176	0.86	18.7	0.60	1.11	0.40	26641	0.11	78384	1704	60135
DU1-SU3	40.72007	-112.24714	6/19/2016	3.38	55.3	253.1	7895	0.91	22.1	0.66	0.89	0.34	29612	0.12	68906	1711	74171
DU1-SU4	40.75307	-112.18496	6/21/2016	8.44	23.5	104.2	6292	2.31	33.7	1.51	2.04	0.68	38697	0.16	73634	1068	75718
DU1-SU5	40.77443	-112.16576	7/1/2016	11.11	27.1	48.8	9021	3.02	50.6	2.07	3.24	0.89	42263	0.19	38606	812	49254
DU1-SU6	40.79201	-112.14101	7/19/2016	12.97	28.3	103.3	11986	3.59	70.5	2.48	3.52	0.75	57535	1.60	18555	839	41979
DU1-SU7	40.81083	-112.14437	7/20/2016	16.08	26.1	159.4	13529	4.36	84.5	2.98	4.99	0.96	71689	0.44	36200	765	33820
DU2-SU1	40.8393	-112.14633	7/4/2016	14.08	26.6	141.2	11631	3.84	68.6	2.61	4.48	0.66	60291	0.25	28349	1153	17105
DU2-SU2	40.86485	-112.13326	7/21/2016	9.99	23.5	115.9	8410	2.71	51.5	1.86	2.94	0.78	45553	0.15	28377	1725	12478
DU2-SU3	40.89587	-112.09879	7/7/2016	5.29	12.9	79.7	5111	1.43	29.3	1.03	1.42	0.60	23759	0.37	24367	1593	8670
DU2-SU4	40.89235	-112.1451	9/4/2016	10.35	20.4	164.3	10903	2.78	58.3	1.89	3.18	0.96	62100	0.17	31027	1973	23026
DU2-SU5	40.92829	-112.14442	11/13/2016	12.61	18.4	157.9	10688	3.36	69.5	2.34	3.88	1.80	90666	0.14	21920	1833	27903
DU2-SU6	40.92275	-112.11042	9/8/2016	6.48	22.3	104.4	8086	1.70	39.7	1.17	2.00	1.14	35168	0.52	31203	2317	24274
DU2-SU7	40.9639	-112.14846	11/15/2016	10.82	17.2	101.8	8609	2.89	54.2	2.10	2.66	1.12	51088	0.35	23593	1742	21831
DU2-SU8	40.99807	-112.17333	11/20/2016	14.58	19.5	112.2	10832	3.90	65.9	2.79	3.70	1.19	65660	0.31	25417	1759	27125
DU2-SU9	41.04297	-112.1963	11/16/2016	6.33	15.2	90.2	6025	1.71	34.4	1.18	1.78	0.85	32577	0.35	25416	1911	18207
DU2-SU10	41.0484	-112.25678	11/26/2016	8.03	26.4	153.6	7882	2.15	45.0	1.50	1.92	0.71	40061	0.38	25329	1727	12912
DU2-SU11	41.02334	-112.26201	11/26/2016	8.92	13.2	101.2	7677	2.41	39.4	1.70	1.91	0.51	37962	0.08	40239	1779	25136
DU2-SU12	40.98318	-112.25411	2/16/2017	10.43	47.3	86.0	8194	2.82	50.5	1.86	2.69	0.70	46125	0.14	11874	1752	6730
DU2-SU13	40.91004	-112.23384	3/5/2017	14.49	54.2	124.4	10936	3.81	63.0	2.88	3.33	0.81	62360	0.28	28088	1364	10766
DU2-SU14	40.85375	-112.19491	3/3/2017	15.58	22.3	129.4	10929	4.23	68.8	3.00	3.92	0.75	65756	0.27	12392	1552	6441
DU3-SU1	40.93069	-112.05908	7/23/2016	8.31	34.1	211.6	8844	2.24	52.0	1.58	3.01	0.95	44681	0.72	15158	1479	9059
DU3-SU2	40.96349	-112.0495	7/25/2016	9.74	14.3	177.8	7606	2.63	55.2	1.82	2.80	0.66	46381	0.30	19915	1084	8749
DU3-SU3	40.96497	-112.08526	6/17/2017	13.95	19.3	149.0	12277	3.69	80.6	2.59	4.67	0.90	67071	0.45	24218	1752	11162
DU3-SU4	40.96507	-112.00103	8/18/2017	11.81	16.8	389.4	13901	3.20	85.6	2.24	4.13	0.84	66840	0.46	19826	1253	6828
DU3-SU5	40.99296	-112.00573	8/24/2017	11.01	13.1	310.7	11778	2.95	67.3	2.05	3.30	0.94	56247	0.23	10747	1050	5279
DU3-SU6	40.99443	-112.04754	8/26/2017	10.24	13.4	158.8	11654	2.75	66.9	1.98	3.84	0.70	72667	0.27	8859	1035	5322
DU3-SU7	40.99924	-112.09302	6/17/2017	13.06	20.0	212.6	11772	3.49	78.2	2.36	3.58	0.99	72506	0.94	19756	2411	9736
DU3-SU8	41.03318	-112.10444	6/1/2017	10.73	20.0	144.3	9523	2.85	62.5	1.99	3.22	0.76	55244	0.71	15600	1381	7341
DU3-SU9	41.06211	-112.12781	6/1/2017	12.00	20.7	140.3	11051	3.16	74.9	2.19	3.77	0.80	59086	0.99	17299	1412	5073
DU3-SU10	41.08389	-112.1512	6/1/2017	13.64	21.3	127.6	11589	3.65	84.3	2.53	4.10	1.16	69562	0.82	14291	1600	5636
DU4-SU1	40.68222	-112.3875	4/16/2017	9.50	17.5	326.7	10214	2.54	52.8	1.75	3.00	0.81	61619	0.17	23331	2429	11676
DU4-SU2	40.71437	-112.39241	4/30/2017	5.95	15.2	57.4	7908	1.61	33.4	1.13	1.80	0.52	36993	0.12	26015	1852	10054
DU4-SU3	40.74182	-112.38983	4/23/2017	8.69	22.3	111.2	10054	2.32	45.9	1.63	2.63	0.93	46537	0.18	37990	3748	9730
DU4-SU4	40.70033	-112.4299	4/24/2018	12.39	15.3	33.1	13066	3.33	68.5	2.34	4.68	0.67	114757	0.18	12486	1561	7286
DU4-SU5	40.71264	-112.47004	5/26/2017	15.82	20.3	57.4	13014	4.21	83.6	2.91	5.11	0.57	58818	0.14	13795	1307	4136
DU4-SU6	40.74093	-112.41941	4/25/2018	7.35	11.0	21.3	9584	1.96	43.5	1.39	2.19	0.67	78394	0.10	20183	2606	18966
DU4-SU7	40.74093	-112.44395	4/26/2018	8.41	11.6	13.3	9464	2.28	51.9	1.58	2.97	0.43	40209	0.10	15547	2403	8413
DU4-SU8	40.75037	-112.47583	4/28/2018	8.43	11.1	24.7	10106	2.30	50.7	1.60	3.28	0.40	62478	0.09	15597	2111	10488
DU4-SU9	40.78799	-112.43606	5/1/2017	9.39	22.8	86.4	10269	2.57	54.0	1.73	2.89	0.84	62843	0.09	28701	2857	9901
DU4-SU10	40.78045	-112.47128	6/14/2017	10.34	13.4	20.3	11572	2.76	60.5	1.97	4.08	0.71	88562	0.15	19427	2028	10004
DU4-SU11	40.81846	-112.45451	6/14/2017	10.44	17.4	68.7	8827	2.77	54.1	1.94	3.43	0.73	55872	0.09	14803	1801	6226
DU4-SU12	40.88364	-112.48194	5/14/2017	10.26	24.0	50.9	12275	2.74	55.3	1.87	3.26	0.85	91452	0.13	44771	1737	29078
DU4-SU13	40.9153	-112.52553	5/15/2017	15.00	24.4	54.1	13804	4.03	77.0	2.71	4.34	0.74	104322	0.17	27129	2192	26485

[1] - EPA Regional Screening Levels (May 2016) for residential and industrial properties (TR=1E-06, THQ=0.1) cited.

NE - Not Established

BOLD - exceeds the most conservative residential and industrial screening levels.

TABLE A3.2

RESUSPENDED SOIL (PM10) ANALYTICAL RESULTS SUMMARY - ELEMENTS (N - S)

DU5 through DU7

Results in milligrams per kilogram (mg/kg-dry)

Sample Name	Latitude	Longitude	Sample Date	Neodymium	Nickel	Phosphorus	Potassium	Praseodymium	Rubidium	Samarium	Scandium	Selenium	Silicon	Silver	Sodium	Strontium	Sulfur
		[1] *Screening Levels*	*Residential RSLs*	*NE*	*83*	*NE*	*NE*	*NE*	*NE*	*NE*	*NE*	*39*	*NE*	*39*	*NE*	*4,690*	*NE*
			Industrial RSLs	*NE*	*1160*	*NE*	*NE*	*NE*	*NE*	*NE*	*NE*	*584*	*NE*	*584*	*NE*	*70,100*	*NE*
DU5-SU1	41.28562	-112.37845	6/4/2018	17.70	17.9	20.1	18266	4.81	146.5	3.35	7.24	0.60	147108	0.21	14951	1095	11307
DU5-SU2	41.32209	-112.39388	6/4/2018	19.44	18.3	33.6	18547	5.22	159.2	3.64	6.83	0.62	128238	0.25	11719	902	6521
DU5-SU3	41.35859	-112.40339	5/30/2018	22.79	20.4	57.7	21068	6.05	187.2	4.34	9.66	0.62	140829	0.25	12151	681	6422
DU5-SU4	41.39312	-112.29923	6/25/2018	21.83	18.1	104.1	20341	5.89	139.6	4.18	6.78	0.30	144173	0.33	10739	676	4863
DU5-SU5	41.39725	-112.39648	5/30/2018	22.62	21.4	170.9	21690	6.15	165.2	4.28	9.68	0.91	117838	0.23	12796	654	3688
DU5-SU6	41.49835	-112.37112	6/17/2018	27.94	24.0	421.3	23273	7.49	203.3	5.21	10.08	0.53	122627	0.24	26386	666	1962
DU5-SU7	41.45972	-112.42171	6/8/2018	27.84	24.3	399.8	24020	7.55	210.1	5.23	9.83	0.59	115697	0.26	15135	585	2719
DU5-SU8	41.50292	-112.42205	6/10/2018	29.67	24.5	598.0	23643	7.92	185.5	5.57	10.43	0.40	167900	0.31	15314	616	1724
DU5-SU9	41.53919	-112.42205	6/26/2018	32.85	25.1	428.1	25707	8.88	145.5	6.17	12.10	0.90	143606	0.36	14165	846	1976
DU5-SU10	41.53919	-112.36969	6/17/2018	31.70	26.0	371.8	25608	8.59	157.1	5.91	12.14	0.71	127371	0.28	14731	810	1482
DU5-SU11	41.52274	-112.3178	6/15/2018	26.50	24.7	316.6	23982	7.16	181.1	4.96	10.49	0.40	111053	0.23	14427	1137	1940
DU5-SU12	41.57428	-112.41513	6/12/2018	33.25	26.0	332.9	25622	8.99	137.6	6.16	10.96	0.52	134676	0.28	13636	809	2063
DU5-SU13	41.57428	-112.36886	6/16/2018	28.96	22.3	186.7	22986	7.81	144.9	5.50	9.21	0.58	132714	0.28	16521	1374	1934
DU5-BRBR	41.44494	-112.30394	6/14/2018	23.71	21.1	70.3	18509	6.42	123.1	4.51	9.28	0.81	113965	0.25	4171	586	8635
DU6-SU1	40.93511	-112.67206	4/10/2018	14.11	17.3	37.7	13395	3.81	88.9	2.64	5.92	0.61	71408	0.17	8083	1754	2695
DU6-SU2	40.9417	-112.58965	4/19/2018	7.58	13.0	24.1	10503	2.04	46.6	1.49	3.01	0.46	47111	0.05	24559	2284	9580
DU6-SU3	40.96256	-112.6661	4/15/2018	6.96	19.9	17.8	11420	1.88	43.1	1.33	2.21	0.63	53734	0.10	30693	2100	17600
DU6-SU4	40.96256	-112.61973	4/19/2018	6.63	14.4	8.6	10847	1.79	42.4	1.27	2.19	0.55	29568	0.07	33392	2236	10621
DU6-SU5	40.96256	-112.56884	4/21/2018	6.33	12.7	13.5	9752	1.72	39.5	1.19	2.60	0.48	53167	0.04	24935	2518	18628
DU6-SU6	41.0071	-112.65485	4/14/2018	7.41	14.1	20.7	9569	1.97	44.0	1.41	2.60	0.52	44908	0.07	22586	1923	29600
DU6-SU7	41.00098	-112.61876	5/20/2018	6.72	11.5	32.8	9821	1.81	42.0	1.26	2.87	0.35	41332	0.07	24837	2321	18462
DU6-SU8	40.99139	-112.56813	5/16/2018	9.15	14.4	21.5	9804	2.46	49.3	1.80	3.48	0.70	53198	0.07	14652	2261	10834
DU6-SU9	41.03587	-112.61894	6/7/2018	6.16	13.1	15.8	11341	1.65	38.9	1.16	3.22	0.61	39335	0.03	37549	2272	21349
DU6-SU10	41.03587	-112.58252	5/16/2018	5.25	13.0	20.5	8000	1.42	33.6	1.05	2.09	0.34	36027	0.08	29417	2163	9134
DU6-SU11	41.06589	-112.60074	6/2/2018	4.66	11.3	19.3	9508	1.26	32.0	0.89	1.62	0.67	31291	0.06	38918	2386	14405
DU7-SU1	40.94179	-112.71193	2/6/2018	9.56	15.0	192.0	9938	2.63	63.8	1.85	3.83	0.51	52890	0.06	6738	1497	18075
DU7-SU2	40.96245	-112.71972	2/8/2018	6.19	15.4	194.6	7466	1.67	36.7	1.16	2.29	0.32	48580	0.04	10640	1656	27531
DU7-SU3	40.98657	-112.76271	2/9/2018	9.29	14.5	226.6	10107	2.48	54.4	1.78	4.05	0.53	42017	0.07	15843	1911	7516
DU7-SU4	41.05341	-112.77378	2/17/2018	10.54	14.7	301.7	11331	2.84	62.1	2.01	4.08	0.67	67268	0.09	31852	1708	21095
DU7-SU5	40.99457	-112.80986	4/1/2018	15.62	19.8	51.5	15810	4.19	87.7	2.95	6.55	0.85	86014	0.14	14521	1170	9434
DU7-SU6	41.02789	-112.84425	2/17/2018	19.60	22.8	670.1	19809	5.32	136.2	3.72	7.61	0.89	132061	0.20	13659	880	13052
DU7-SU7	41.05451	-112.8084	2/17/2018	14.95	18.1	440.1	15739	4.04	90.7	2.86	5.60	0.62	83064	0.12	11098	1349	5267
DU7-UTTR	41.12974	-112.80566	6/5/2018	18.39	22.4	74.9	17041	5.01	120.1	3.52	6.85	0.94	76207	0.21	10597	1129	6863
DU7-SU10	41.20507	-112.83053	4/3/2018	11.24	16.7	45.3	12817	3.02	65.0	2.15	3.84	0.76	56079	0.07	16552	1533	10251

[1] - EPA Regional Screening Levels (May 2016) for residential and industrial properties (TR=1E-06, THQ=0.1) cited.

NE - Not Established

BOLD - exceeds the most conservative residential and industrial screening levels.

TABLE A3.3

RESUSPENDED SOIL (PM10) ANALYTICAL RESULTS SUMMARY - ELEMENTS (N - S)

DU8 through DU10

Results in milligrams per kilogram (mg/kg-dry)

Sample Name	Latitude	Longitude	Sample Date	Neodymium	Nickel	Phosphorus	Potassium	Praseodymium	Rubidium	Samarium	Scandium	Selenium	Silicon	Silver	Sodium	Strontium	Sulfur
		[1]Screening Levels	*Residential RSLs*	*NE*	*83*	*NE*	*NE*	*NE*	*NE*	*NE*	*NE*	*39*	*NE*	*39*	*NE*	*4,690*	*NE*
			Industrial RSLs	*NE*	*1160*	*NE*	*NE*	*NE*	*NE*	*NE*	*NE*	*584*	*NE*	*584*	*NE*	*70,100*	*NE*
DU8-SU1	41.10304	-112.24551	10/24/2017	10.80	23.3	172.9	14701	2.89	72.4	2.07	4.06	0.35	70323	0.21	36399	1283	17102
DU8-SU2	41.10304	-112.18009	12/22/2017	13.62	15.7	155.0	15836	3.72	142.2	2.51	6.79	0.61	107423	0.46	14836	1215	3426
DU8-SU3	41.15494	-112.31378	10/29/2017	9.95	18.3	147.6	13695	2.65	77.5	1.93	5.01	0.37	99587	0.18	17309	1381	13776
DU8-SU4	41.21984	-112.29187	5/24/2018	15.39	16.4	58.7	17516	4.14	113.6	2.95	5.68	0.39	83364	0.14	24885	1178	13690
DU8-SU5	41.13822	-112.20025	12/2/2017	21.69	22.1	103.4	21918	5.86	162.1	4.20	9.55	0.77	110495	0.98	14565	648	7417
DU8-SU6	41.22436	-112.25495	5/22/2018	21.86	20.5	134.4	21263	5.94	165.7	4.24	8.70	0.82	104022	0.46	12344	445	8293
DU9-SU1	41.24013	-112.85881	8/8/2018	9.18	13.3	34.2	13030	2.46	60.3	1.80	3.63	0.60	47347	0.17	15955	2241	11094
DU9-SU2	41.28429	-112.8848	8/7/2018	4.00	6.8	22.1	18498	1.07	36.0	0.76	1.80	0.39	29913	0.08	52887	1755	21013
DU9-SU3	41.32139	-112.92682	8/7/2018	4.39	9.0	93.0	19299	1.23	37.2	0.84	3.00	0.60	23764	0.11	69411	1824	27598
DU9-SU4	41.37304	-112.95394	7/1/2018	22.94	21.9	93.7	20867	6.21	127.3	4.31	7.92	0.53	133083	0.19	15804	1240	153487
DU9-SU5	41.37514	-112.99337	5/18/2018	7.65	11.6	26.3	10801	2.05	47.7	1.46	2.85	0.48	50641	0.11	17802	2743	21331
DU9-SU6	41.44428	-112.99873	7/3/2018	6.45	10.3	25.1	10271	1.74	41.2	1.21	3.21	0.44	41628	0.04	20439	2745	17127
DU9-SU7	41.44668	-112.96344	7/14/2018	3.87	9.2	16.5	12694	1.07	27.6	0.75	1.65	0.30	21953	0.05	42645	3006	21337
DU9-SU8	41.48131	-113.04297	7/3/2018	9.39	12.7	44.0	11992	2.50	53.3	1.76	4.02	0.39	40887	0.09	12581	1668	9289
DU9-SU9	41.52268	-112.96429	7/14/2018	3.84	10.0	39.5	13432	1.03	29.7	0.73	1.71	0.30	17201	0.11	56924	2764	21117
DU9-SU10	41.5214	-112.99844	7/6/2018	5.61	9.9	32.8	10706	1.51	37.6	1.03	2.98	0.42	27602	0.07	25418	2899	17733
DU9-SU11	41.53881	-113.06245	7/6/2018	9.15	16.7	28.6	10874	2.49	53.2	1.78	3.81	0.51	47093	0.07	19320	1705	13499
DU9-SU12	41.57511	-112.94772	7/10/2018	4.43	10.0	21.8	12299	1.21	32.7	0.83	2.54	0.59	17593	0.04	39963	2614	11882
DU9-SU13	41.59301	-112.99806	7/18/2018	6.76	11.7	9.9	11840	1.84	45.4	1.28	3.67	0.41	33614	0.08	21060	2609	15288
DU9-SU14	41.59301	-113.04626	7/20/2018	22.45	22.8	31.1	21943	6.04	140.5	4.17	9.73	0.46	104527	0.23	11724	1190	7265
DU9-SU15	41.59301	-113.09327	7/20/2018	16.04	20.0	30.8	17106	4.36	93.0	3.01	6.14	0.54	76215	0.15	14856	903	7990
DU9-SU16	41.65615	-112.90238	7/7/2018	6.77	10.7	15.3	11167	1.86	46.9	1.30	2.90	0.80	32546	0.07	18137	2340	8983
DU9-SU17	41.6295	-112.95021	7/10/2018	7.24	12.0	10.5	11730	1.99	49.5	1.38	3.53	0.64	35233	0.05	18216	2761	8435
DU9-SU18	41.66467	-112.99832	7/21/2018	15.22	18.7	21.1	16619	4.11	96.7	2.93	6.35	0.40	71818	0.13	14554	1379	9047
DU9-SU19	41.66467	-113.04671	7/23/2018	16.77	20.6	25.7	16841	4.52	105.8	3.09	7.12	0.36	90298	0.11	19530	1029	8600
DU9-SU20	41.66467	-113.09305	8/4/2018	23.49	24.9	74.1	22196	6.35	146.2	4.35	9.60	0.53	112727	0.18	13957	1010	4467
DU9-SU21	41.69225	-113.13276	8/5/2018	27.46	26.1	122.5	25284	7.43	165.5	5.20	12.65	0.51	146766	0.25	13495	854	4574
DU9-SU22	41.7176	-113.06916	8/5/2018	30.49	28.1	208.7	26498	8.20	167.2	5.84	11.62	0.78	134865	0.25	10856	421	2390
DU9-SU23	41.74901	-112.99046	7/16/2018	26.98	27.2	143.1	23827	7.31	137.0	5.14	11.20	0.57	119943	0.27	9110	396	2320
DU10-SU1	41.20439	-112.45391	5/6/2017	12.40	22.3	81.8	16153	3.31	77.7	2.26	4.12	0.66	71061	0.22	40304	1955	43101
DU10-SU2	41.25124	-112.50709	5/7/2017	19.16	27.5	77.4	18785	5.13	107.9	3.50	7.13	0.92	77314	0.14	34147	1508	16402
DU10-SU3	41.30465	-112.5105	2/4/2018	9.18	18.5	86.7	10083	2.44	51.3	1.71	3.91	0.61	79634	0.11	16737	2409	7066
DU10-SU4	41.38096	-112.54783	7/22/2017	5.69	19.2	84.1	11224	1.54	34.9	1.11	2.56	0.30	47511	0.09	43871	2425	20696
DU10-SU5	41.43142	-112.56648	7/24/2017	7.03	14.7	106.5	9103	1.90	37.2	1.33	3.31	0.34	57569	0.06	43082	2563	16366
DU10-SU6	41.45664	-112.59062	5/22/2017	9.48	14.5	55.9	8562	2.55	50.9	1.71	2.84	0.60	66910	0.18	17670	2008	9014
DU10-SU7	41.42856	-112.62285	5/22/2017	8.42	14.7	55.7	8107	2.28	41.0	1.60	2.64	0.46	38486	0.13	22194	2612	11872
DU10-SU8	41.46849	-112.72485	5/20/2017	14.09	17.2	175.3	11561	3.69	67.8	2.60	4.53	0.74	48377	0.16	17850	1825	9235
DU10-SU9	41.54727	-112.79302	7/11/2018	9.64	13.6	14.0	13935	2.60	55.7	1.84	4.17	0.69	49367	0.08	43088	2088	13611
DU10-SU10	41.6092	-112.77721	7/13/2018	8.61	13.5	14.7	11674	2.35	48.1	1.66	4.16	0.39	45133	0.10	27363	2714	11361
DU10-SU11	41.64667	-112.76641	7/8/2018	6.64	12.1	8.0	10247	1.80	42.1	1.30	4.55	0.44	33937	0.07	22792	3296	9233
DU10-SU12	41.68228	-112.75655	7/2/2018	11.35	16.7	23.9	12756	3.04	70.9	2.10	4.34	0.83	61445	0.06	19065	2270	10060
DU10-SU13	41.70729	-112.78171	12/9/2017	18.48	21.3	271.0	17197	4.92	98.7	3.39	7.80	0.79	105315	0.15	12553	1011	4606
DU10-SU14	41.68538	-112.80629	10/18/2017	10.13	19.5	134.4	12469	2.72	54.7	1.93	4.46	0.46	68675	0.10	37702	1926	17253
DU10-SU15	41.67995	-112.85396	7/30/2017	11.16	17.0	205.8	13494	2.99	63.7	2.12	4.51	0.63	62956	0.10	27787	2032	12788

[1] - EPA Regional Screening Levels (May 2016) for residential and industrial properties (TR=1E-06, THQ=0.1) cited.

NE - Not Established

BOLD - exceeds the most conservative residential and industrial screening levels.

TABLE A4.1

RESUSPENDED SOIL (PM10) ANALYTICAL RESULTS SUMMARY - ELEMENTS (T - Z)

DU1 through DU4

Results in milligrams per kilogram (mg/kg-dry)

Sample Name	Latitude	Longitude	Sample Date	Terbium	Thallium	Thorium	Titanium	Uranium	Vanadium	Yterbium	Yttrium	Zinc	Zirconium
		[1]Screening Levels	*Residential RSLs*	*NE*	*0.08*	*NE*	*NE*	*1.6*	*39*	*NE*	*NE*	*2,350*	*0.63*
			Industrial RSLs	*NE*	*1.2*	*NE*	*NE*	*23*	*583*	*NE*	*NE*	*35,000*	*9.3*
DU1-SU1	40.68191	-112.33737	6/16/2016	0.08	0.08	1.27	265	3.26	9.4	0.22	2.55	74	1.86
DU1-SU2	40.70134	-112.28841	6/18/2016	0.08	0.10	1.45	309	3.36	10.7	0.22	2.56	95	1.26
DU1-SU3	40.72007	-112.24714	6/19/2016	0.09	0.20	1.48	301	3.42	13.0	0.23	2.75	132	1.07
DU1-SU4	40.75307	-112.18496	6/21/2016	0.17	0.30	5.12	716	2.94	27.7	0.39	5.27	107	1.32
DU1-SU5	40.77443	-112.16576	7/1/2016	0.26	0.40	6.12	1208	4.69	29.3	0.63	8.09	166	2.43
DU1-SU6	40.79201	-112.14101	7/19/2016	0.30	0.47	6.53	1520	4.09	34.2	0.79	9.14	150	4.31
DU1-SU7	40.81083	-112.14437	7/20/2016	0.36	0.58	8.21	2219	4.66	43.1	0.93	11.41	296	5.53
DU2-SU1	40.8393	-112.14633	7/4/2016	0.32	0.42	7.17	1532	5.85	40.4	0.87	10.48	193	5.34
DU2-SU2	40.86485	-112.13326	7/21/2016	0.24	0.30	4.89	1104	7.73	33.3	0.67	7.92	102	2.76
DU2-SU3	40.89587	-112.09879	7/7/2016	0.13	0.17	2.42	523	5.31	19.2	0.35	4.12	134	2.07
DU2-SU4	40.89235	-112.1451	9/4/2016	0.26	0.28	4.71	1322	8.22	32.1	0.85	8.94	151	4.04
DU2-SU5	40.92829	-112.14442	11/13/2016	0.34	0.30	5.79	1658	8.09	37.8	1.09	11.44	185	4.07
DU2-SU6	40.92275	-112.11042	9/8/2016	0.16	0.19	2.79	780	6.50	22.6	0.49	5.28	196	2.84
DU2-SU7	40.9639	-112.14846	11/15/2016	0.30	0.24	4.92	1252	8.63	33.5	0.98	10.11	134	4.23
DU2-SU8	40.99807	-112.17333	11/20/2016	0.39	0.35	6.42	1867	10.73	42.1	1.21	12.77	156	5.24
DU2-SU9	41.04297	-112.1963	11/16/2016	0.15	0.24	2.76	746	8.92	26.9	0.52	5.48	139	4.21
DU2-SU10	41.0484	-112.25678	11/26/2016	0.19	0.21	3.42	961	6.52	26.7	0.63	6.60	153	4.74
DU2-SU11	41.02334	-112.26201	11/26/2016	0.21	0.17	3.73	911	5.34	21.3	0.71	7.60	120	4.10
DU2-SU12	40.98318	-112.25411	2/16/2017	0.26	0.25	4.23	1190	6.64	28.7	0.89	9.26	207	3.99
DU2-SU13	40.91004	-112.23384	3/5/2017	0.41	0.31	5.86	1920	6.06	32.4	1.34	14.21	214	4.31
DU2-SU14	40.85375	-112.19491	3/3/2017	0.40	0.40	6.90	1836	7.13	37.0	1.31	13.04	187	4.35
DU3-SU1	40.93069	-112.05908	7/23/2016	0.20	0.29	3.99	1071	6.91	30.6	0.54	6.62	298	5.46
DU3-SU2	40.96349	-112.0495	7/25/2016	0.23	0.27	4.63	981	6.94	29.4	0.63	7.50	159	4.66
DU3-SU3	40.96497	-112.08526	6/17/2017	0.34	0.35	5.75	1621	9.20	39.8	1.07	10.86	214	3.15
DU3-SU4	40.96507	-112.00103	8/18/2017	0.28	0.32	6.00	1180	7.52	36.0	0.88	9.58	183	**14.27**
DU3-SU5	40.99296	-112.00573	8/24/2017	0.26	0.26	5.26	1198	7.07	32.0	0.79	8.85	213	**13.83**
DU3-SU6	40.99443	-112.04754	8/26/2017	0.24	0.26	5.12	1078	6.56	29.9	0.77	8.45	161	7.77
DU3-SU7	40.99924	-112.09302	6/17/2017	0.31	0.33	4.68	1708	9.29	38.4	0.96	10.02	325	4.56
DU3-SU8	41.03318	-112.10444	6/1/2017	0.26	0.32	4.36	1259	7.72	31.7	0.86	8.14	213	3.66
DU3-SU9	41.06211	-112.12781	6/1/2017	0.28	0.35	4.89	1277	6.41	35.9	0.91	9.02	208	2.83
DU3-SU10	41.08389	-112.1512	6/1/2017	0.32	0.39	5.61	1594	7.58	39.9	1.06	10.32	260	3.13
DU4-SU1	40.68222	-112.3875	4/16/2017	0.23	0.28	4.13	1470	7.95	33.3	0.75	8.17	164	7.29
DU4-SU2	40.71437	-112.39241	4/30/2017	0.15	0.18	2.63	698	6.60	22.6	0.51	5.41	128	1.08
DU4-SU3	40.74182	-112.38983	4/23/2017	0.22	0.25	3.60	970	9.53	30.8	0.72	7.69	209	2.58
DU4-SU4	40.70033	-112.4299	4/24/2018	0.29	0.32	6.18	1250	6.78	38.0	0.96	10.24	104	4.32
DU4-SU5	40.71264	-112.47004	5/26/2017	0.36	0.38	7.17	1450	5.37	43.9	1.22	12.36	100	2.05
DU4-SU6	40.74093	-112.41941	4/25/2018	0.18	0.18	3.57	727	6.06	24.0	0.59	6.41	93	2.85
DU4-SU7	40.74093	-112.44395	4/26/2018	0.21	0.19	4.29	852	5.34	26.6	0.69	7.45	85	2.04
DU4-SU8	40.75037	-112.47583	4/28/2018	0.20	0.19	4.39	829	5.40	28.2	0.70	7.42	73	4.12
DU4-SU9	40.78799	-112.43606	5/1/2017	0.23	0.24	4.12	1248	8.08	33.0	0.77	8.20	151	2.53
DU4-SU10	40.78045	-112.47128	6/14/2017	0.25	0.23	5.20	1036	6.32	32.1	0.84	8.83	81	3.71
DU4-SU11	40.81846	-112.45451	6/14/2017	0.25	0.26	4.52	1257	6.69	33.0	0.83	8.71	108	2.27
DU4-SU12	40.88364	-112.48194	5/14/2017	0.24	0.27	4.25	1170	7.65	36.3	0.81	8.36	141	1.29
DU4-SU13	40.9153	-112.52553	5/15/2017	0.35	0.47	6.33	1851	6.88	43.3	1.15	12.12	162	2.78

[1] - EPA Regional Screening Levels (May 2016) for residential and industrial properties (TR=1E-06, THQ=0.1) cited.

NE - Not Established

BOLD - exceeds the most conservative residential and industrial screening levels.

TABLE A4.2

RESUSPENDED SOIL (PM10) ANALYTICAL RESULTS SUMMARY - ELEMENTS (T - Z)

DU5 through DU7

Results in milligrams per kilogram (mg/kg-dry)

Sample Name	Latitude	Longitude	Sample Date	Terbium	Thallium	Thorium	Titanium	Uranium	Vanadium	Yterbium	Yttrium	Zinc	Zirconium
		[1]Screening Levels	*Residential RSLs*	*NE*	*0.08*	*NE*	*NE*	*1.6*	*39*	*NE*	*NE*	*2,350*	*0.63*
			Industrial RSLs	*NE*	*1.2*	*NE*	*NE*	*23*	*583*	*NE*	*NE*	*35,000*	*9.3*
DU5-SU1	41.28562	-112.37845	6/4/2018	0.42	0.44	8.54	1667	4.90	45.4	1.29	14.37	102	4.51
DU5-SU2	41.32209	-112.39388	6/4/2018	0.45	0.44	9.27	1845	4.33	46.8	1.39	15.65	125	4.98
DU5-SU3	41.35859	-112.40339	5/30/2018	0.52	0.48	10.88	2094	4.15	54.9	1.66	18.06	111	5.09
DU5-SU4	41.39312	-112.29923	6/25/2018	0.51	0.47	10.14	2010	3.03	46.2	1.60	17.96	133	4.92
DU5-SU5	41.39725	-112.39648	5/30/2018	0.52	0.49	10.52	2240	4.14	60.1	1.61	18.46	141	5.90
DU5-SU6	41.49835	-112.37112	6/17/2018	0.63	0.51	12.99	2593	3.80	62.5	1.96	21.63	109	8.62
DU5-SU7	41.45972	-112.42171	6/8/2018	0.63	0.53	12.78	2910	4.01	64.9	1.98	22.15	133	7.49
DU5-SU8	41.50292	-112.42205	6/10/2018	0.67	0.51	13.87	2993	4.32	64.3	2.10	22.82	116	7.37
DU5-SU9	41.53919	-112.42205	6/26/2018	0.74	0.57	14.75	3097	3.64	68.9	2.35	26.14	136	6.76
DU5-SU10	41.53919	-112.36969	6/17/2018	0.69	0.55	14.55	2973	3.95	71.6	2.19	24.71	135	8.03
DU5-SU11	41.52274	-112.3178	6/15/2018	0.60	0.49	12.62	2739	4.07	68.0	1.89	20.83	133	7.27
DU5-SU12	41.57428	-112.41513	6/12/2018	0.75	0.57	15.05	3114	3.53	69.4	2.35	26.22	126	7.40
DU5-SU13	41.57428	-112.36886	6/16/2018	0.65	0.51	13.08	2599	3.25	60.5	2.03	22.32	216	6.16
DU5-BRBR	41.44494	-112.30394	6/14/2018	0.56	0.51	11.54	2638	2.24	57.0	1.75	19.86	135	6.11
DU6-SU1	40.93511	-112.67206	4/10/2018	0.34	0.32	6.86	1338	5.71	42.9	1.11	12.27	86	4.48
DU6-SU2	40.9417	-112.58965	4/19/2018	0.19	0.18	3.60	658	6.66	27.9	0.60	6.68	79	2.71
DU6-SU3	40.96256	-112.6661	4/15/2018	0.17	0.17	3.12	562	5.37	28.6	0.54	6.32	99	2.50
DU6-SU4	40.96256	-112.61973	4/19/2018	0.15	0.16	3.03	559	5.87	28.1	0.53	5.81	90	1.53
DU6-SU5	40.96256	-112.56884	4/21/2018	0.15	0.16	2.99	526	6.22	25.9	0.52	5.70	95	2.83
DU6-SU6	41.0071	-112.65485	4/14/2018	0.17	0.20	3.38	741	4.30	27.0	0.55	6.40	100	1.75
DU6-SU7	41.00098	-112.61876	5/20/2018	0.16	0.16	3.17	814	5.47	26.8	0.52	5.91	83	2.26
DU6-SU8	40.99139	-112.56813	5/16/2018	0.22	0.21	4.40	941	6.88	31.6	0.70	7.97	95	1.94
DU6-SU9	41.03587	-112.61894	6/7/2018	0.14	0.15	2.76	579	5.17	27.6	0.48	5.25	104	1.22
DU6-SU10	41.03587	-112.58252	5/16/2018	0.14	0.16	2.34	474	6.20	27.8	0.48	4.71	121	1.55
DU6-SU11	41.06589	-112.60074	6/2/2018	0.11	0.15	2.01	402	5.73	24.5	0.36	4.02	96	1.09
DU7-SU1	40.94179	-112.71193	2/6/2018	0.23	0.21	4.58	918	4.65	33.7	0.74	8.52	113	7.46
DU7-SU2	40.96245	-112.71972	2/8/2018	0.15	0.13	2.96	600	4.53	23.6	0.51	5.68	82	7.68
DU7-SU3	40.98657	-112.76271	2/9/2018	0.22	0.17	4.11	792	5.40	30.6	0.70	8.16	125	9.10
DU7-SU4	41.05341	-112.77378	2/17/2018	0.26	0.20	4.92	1121	4.41	32.1	0.86	9.77	106	**12.48**
DU7-SU5	40.99457	-112.80986	4/1/2018	0.37	0.30	7.29	1797	5.45	46.8	1.19	13.48	116	4.15
DU7-SU6	41.02789	-112.84425	2/17/2018	0.45	0.38	9.17	2213	5.49	60.4	1.46	16.54	112	**23.84**
DU7-SU7	41.05451	-112.8084	2/17/2018	0.36	0.28	7.07	1668	6.12	47.1	1.16	13.48	103	**13.33**
DU7-UTTR	41.12974	-112.80566	6/5/2018	0.43	0.33	8.56	1863	5.08	50.1	1.38	15.97	99	4.64
DU7-SU10	41.20507	-112.83053	4/3/2018	0.28	0.22	5.21	1190	5.40	38.6	0.88	10.51	109	2.65

[1] - EPA Regional Screening Levels (May 2016) for residential and industrial properties (TR=1E-06, THQ=0.1) cited.

NE - Not Established

BOLD - exceeds the most conservative residential and industrial screening levels.

TABLE A4.3

RESUSPENDED SOIL (PM10) ANALYTICAL RESULTS SUMMARY - ELEMENTS (T - Z)

DU8 through DU10

Results in milligrams per kilogram (mg/kg-dry)

Sample Name	Latitude	Longitude	Sample Date	Terbium	Thallium	Thorium	Titanium	Uranium	Vanadium	Yterbium	Yttrium	Zinc	Zirconium
		[1] *Screening Levels*	*Residential RSLs*	*NE*	*0.08*	*NE*	*NE*	*1.6*	*39*	*NE*	*NE*	*2,350*	*0.63*
			Industrial RSLs	*NE*	*1.2*	*NE*	*NE*	*23*	*583*	*NE*	*NE*	*35,000*	*9.3*
DU8-SU1	41.10304	-112.24551	10/24/2017	0.25	0.23	4.98	1048	5.05	31.5	0.78	9.34	125	7.19
DU8-SU2	41.10304	-112.18009	12/22/2017	0.32	0.38	6.48	1450	3.47	40.3	0.98	11.37	135	6.63
DU8-SU3	41.15494	-112.31378	10/29/2017	0.24	0.29	4.95	1450	4.53	38.7	0.81	8.77	128	7.96
DU8-SU4	41.21984	-112.29187	5/24/2018	0.36	0.35	7.10	1683	4.13	40.1	1.09	13.07	131	3.32
DU8-SU5	41.13822	-112.20025	12/2/2017	0.52	0.52	9.98	2606	3.93	58.4	1.61	18.77	237	4.16
DU8-SU6	41.22436	-112.25495	5/22/2018	0.51	0.44	9.91	2468	4.42	57.3	1.58	18.73	205	5.11
DU9-SU1	41.24013	-112.85881	8/8/2018	0.22	0.22	4.07	877	6.37	32.5	0.70	8.27	114	1.82
DU9-SU2	41.28429	-112.8848	8/7/2018	0.10	0.09	1.62	350	3.96	15.6	0.31	3.43	95	1.20
DU9-SU3	41.32139	-112.92682	8/7/2018	0.12	0.10	1.98	533	4.64	16.7	0.37	3.87	181	2.56
DU9-SU4	41.37304	-112.95394	7/1/2018	0.53	0.36	10.31	1635	4.96	58.1	1.71	19.63	116	4.64
DU9-SU5	41.37514	-112.99337	5/18/2018	0.18	0.14	3.51	804	7.86	27.5	0.61	7.00	87	2.94
DU9-SU6	41.44428	-112.99873	7/3/2018	0.15	0.13	3.01	684	6.68	23.7	0.51	5.85	67	1.50
DU9-SU7	41.44668	-112.96344	7/14/2018	0.10	0.07	1.72	328	6.20	15.9	0.30	3.39	104	1.45
DU9-SU8	41.48131	-113.04297	7/3/2018	0.22	0.16	4.29	989	6.05	32.5	0.73	8.57	74	3.57
DU9-SU9	41.52268	-112.96429	7/14/2018	0.09	0.09	1.62	380	6.65	16.0	0.33	3.43	102	1.91
DU9-SU10	41.5214	-112.99844	7/6/2018	0.13	0.11	2.52	463	7.54	22.9	0.43	5.01	82	1.76
DU9-SU11	41.53881	-113.06245	7/6/2018	0.22	0.18	4.04	904	5.90	33.0	0.73	8.26	99	2.40
DU9-SU12	41.57511	-112.94772	7/10/2018	0.10	0.10	1.99	369	6.73	17.4	0.34	3.98	103	1.54
DU9-SU13	41.59301	-112.99806	7/18/2018	0.16	0.14	2.93	638	7.66	27.5	0.55	6.14	94	1.44
DU9-SU14	41.59301	-113.04626	7/20/2018	0.53	0.43	9.84	2541	4.64	60.7	1.67	19.18	136	3.51
DU9-SU15	41.59301	-113.09327	7/20/2018	0.38	0.29	7.52	1820	5.28	50.4	1.24	14.53	105	2.83
DU9-SU16	41.65615	-112.90238	7/7/2018	0.16	0.13	3.07	602	6.43	33.4	0.54	6.22	89	1.76
DU9-SU17	41.6295	-112.95021	7/10/2018	0.17	0.14	3.23	660	8.19	32.4	0.58	6.70	95	1.62
DU9-SU18	41.66467	-112.99832	7/21/2018	0.36	0.24	6.61	1415	5.48	50.2	1.18	13.34	163	2.84
DU9-SU19	41.66467	-113.04671	7/23/2018	0.39	0.28	7.40	1898	5.00	52.7	1.29	14.61	142	3.21
DU9-SU20	41.66467	-113.09305	8/4/2018	0.56	0.37	10.24	2568	5.20	65.2	1.70	20.34	151	4.24
DU9-SU21	41.69225	-113.13276	8/5/2018	0.64	0.55	11.89	3128	4.02	74.2	2.00	23.37	154	4.31
DU9-SU22	41.7176	-113.06916	8/5/2018	0.71	0.57	13.85	3341	3.50	77.3	2.20	26.09	130	3.86
DU9-SU23	41.74901	-112.99046	7/16/2018	0.62	0.48	12.24	3087	4.05	73.7	2.07	23.49	138	3.68
DU10-SU1	41.20439	-112.45391	5/6/2017	0.30	0.28	5.46	1650	5.88	37.7	0.97	10.27	137	4.25
DU10-SU2	41.25124	-112.50709	5/7/2017	0.44	0.47	8.10	2444	7.66	64.9	1.38	14.90	126	3.41
DU10-SU3	41.30465	-112.5105	2/4/2018	0.21	0.19	4.27	1018	8.27	37.3	0.68	7.62	82	6.70
DU10-SU4	41.38096	-112.54783	7/22/2017	0.13	0.13	2.38	518	6.34	23.3	0.46	5.03	110	4.40
DU10-SU5	41.43142	-112.56648	7/24/2017	0.17	0.14	3.06	593	6.10	24.2	0.54	6.33	93	5.06
DU10-SU6	41.45664	-112.59062	5/22/2017	0.23	0.32	3.77	1026	5.30	30.1	0.77	7.75	102	2.14
DU10-SU7	41.42856	-112.62285	5/22/2017	0.20	0.18	3.58	905	7.66	27.0	0.67	6.75	71	2.09
DU10-SU8	41.46849	-112.72485	5/20/2017	0.34	0.35	5.37	1543	7.86	42.0	1.07	11.18	107	3.80
DU10-SU9	41.54727	-112.79302	7/11/2018	0.22	0.28	4.05	962	6.14	34.2	0.71	8.40	134	1.18
DU10-SU10	41.6092	-112.77721	7/13/2018	0.20	0.17	3.83	751	7.01	29.4	0.66	7.80	108	1.35
DU10-SU11	41.64667	-112.76641	7/8/2018	0.16	0.12	2.91	593	7.55	26.5	0.53	6.07	107	1.75
DU10-SU12	41.68228	-112.75655	7/2/2018	0.27	0.20	4.72	1132	5.82	36.3	0.86	9.99	176	3.11
DU10-SU13	41.70729	-112.78171	12/9/2017	0.42	0.33	8.01	1670	4.43	54.6	1.42	15.99	123	**11.89**
DU10-SU14	41.68538	-112.80629	10/18/2017	0.24	0.18	4.61	985	6.07	33.4	0.78	9.23	74	7.50
DU10-SU15	41.67995	-112.85396	7/30/2017	0.26	0.20	4.93	1115	7.14	38.7	0.85	9.70	99	**10.65**

[1] - EPA Regional Screening Levels (May 2016) for residential and industrial properties (TR=1E-06, THQ=0.1) cited.

NE - Not Established

BOLD - exceeds the most conservative residential and industrial screening levels.

Appendix H: Maps Showing the Spatial Distributions of the PM_{10} Soil Elements

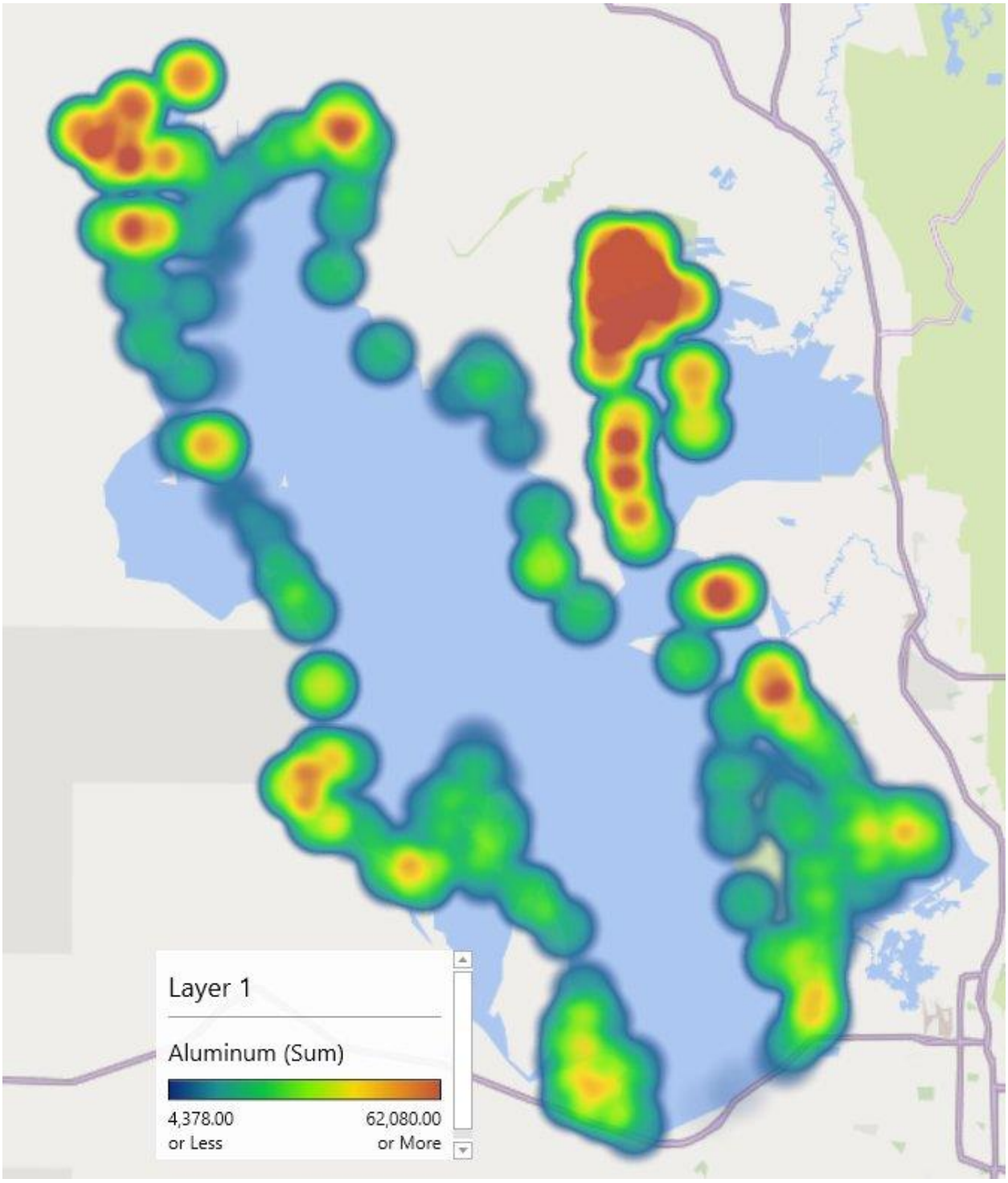

Figure H.1 Map showing the spatial distribution of aluminum (mg/kg) in the PM_{10} fraction of the soil.

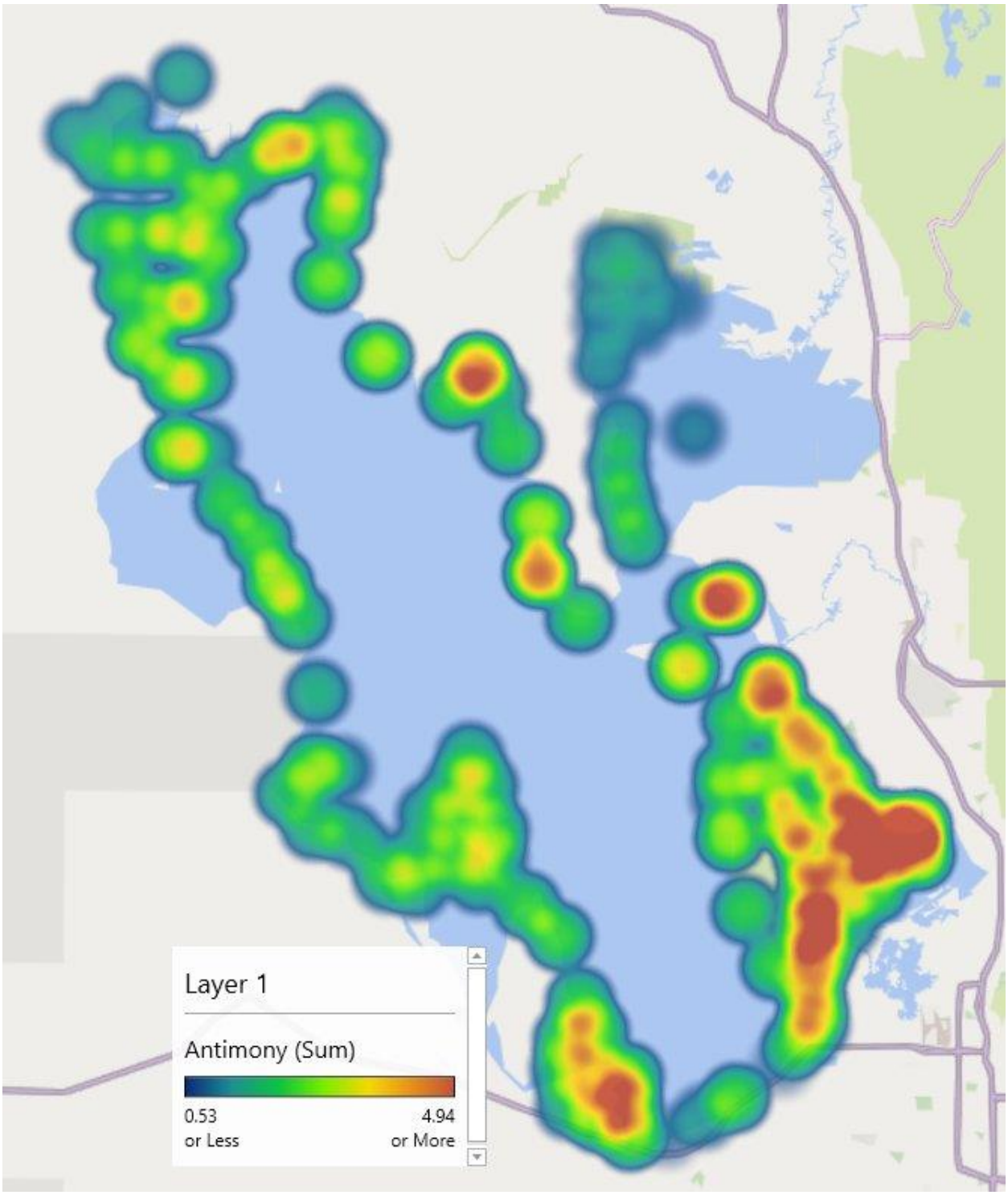

Figure H.2 Map showing the spatial distribution of antimony (mg/kg) in the PM_{10} fraction of the soil.

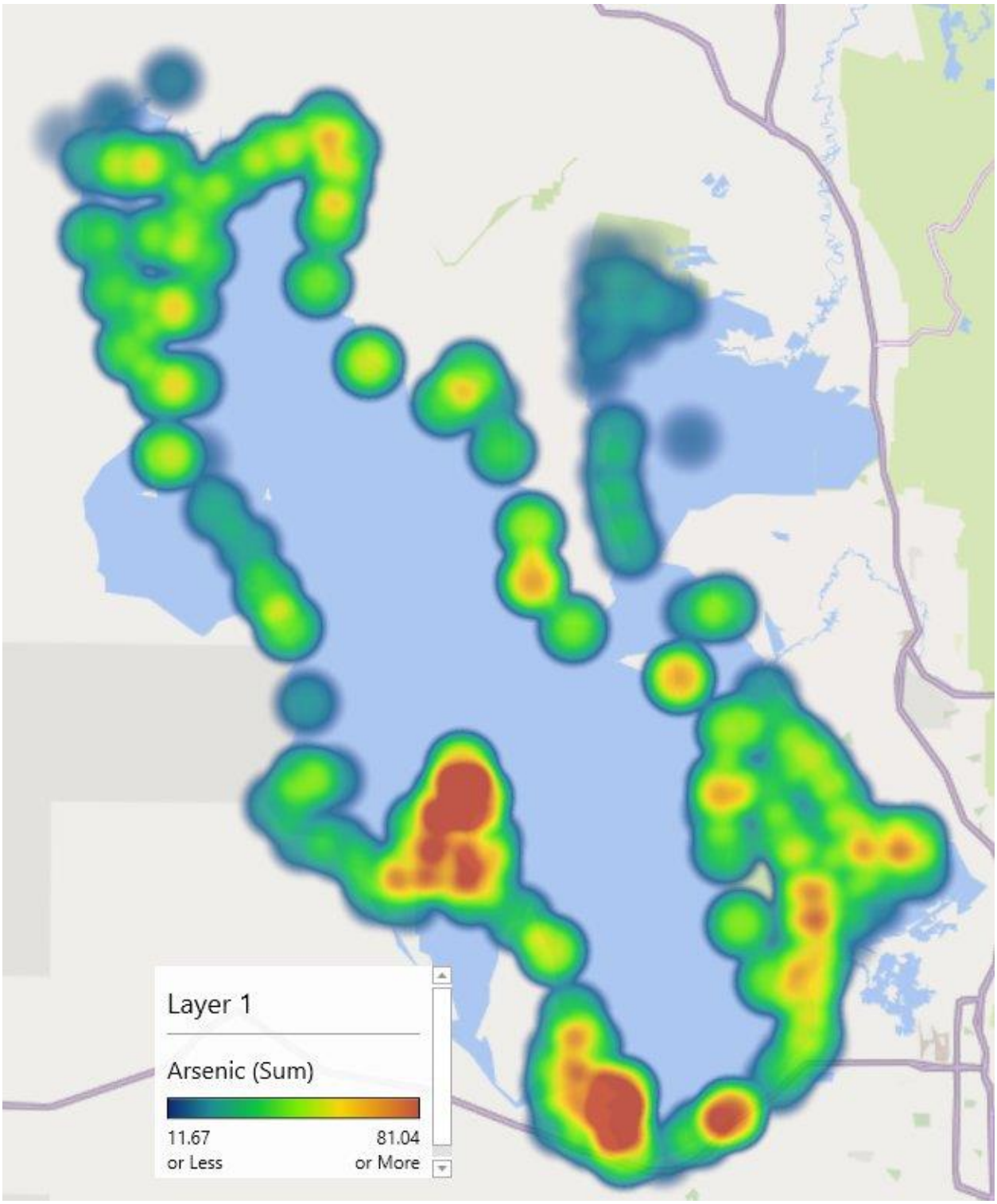

Figure H.3 Map showing the spatial distribution of arsenic (mg/kg) in the PM_{10} fraction of the soil.

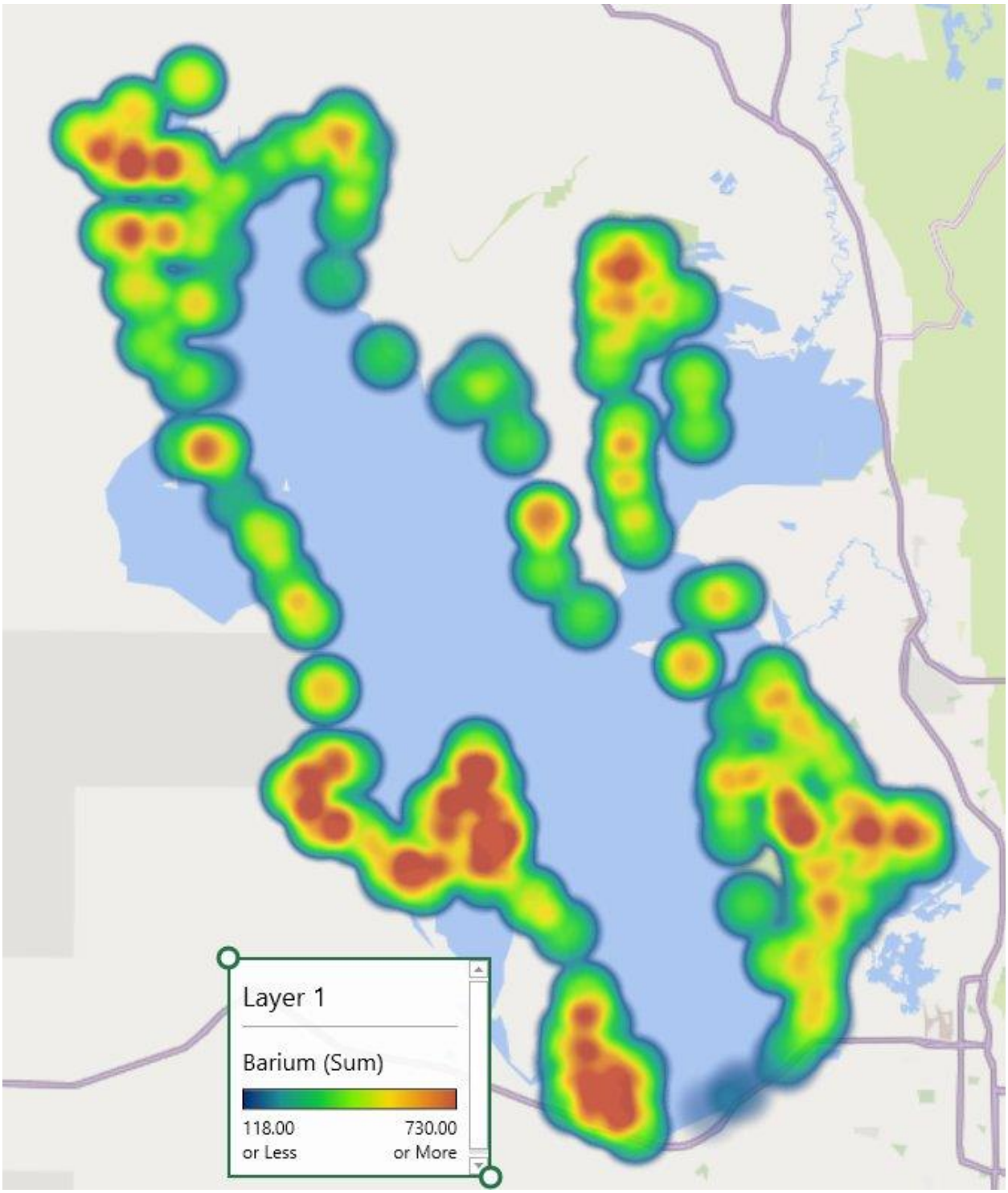

Figure H.4 Map showing the spatial distribution of barium (mg/kg) in the PM_{10} fraction of the soil.

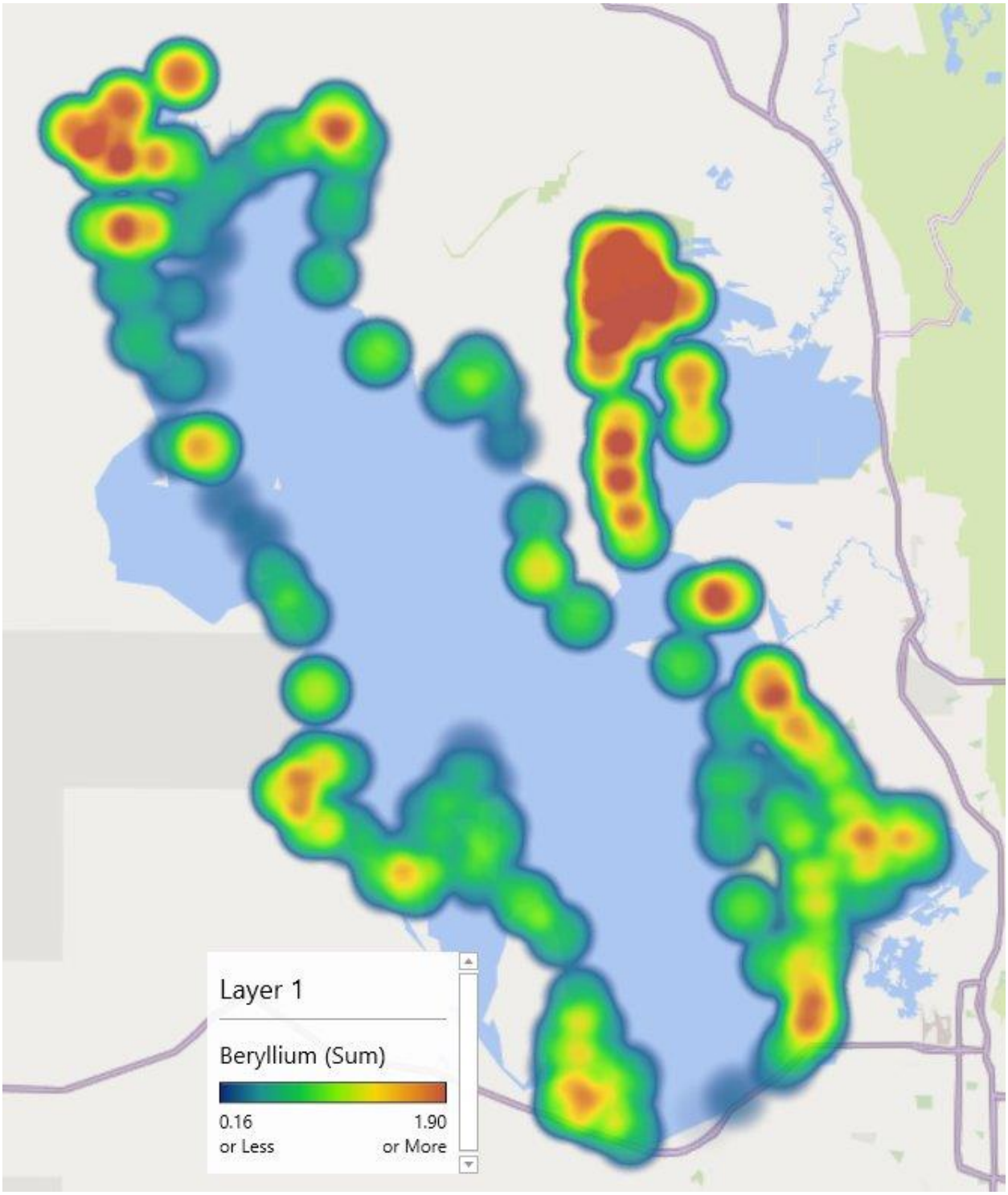

Figure H.5 Map showing the spatial distribution of beryllium (mg/kg) in the PM_{10} fraction of the soil.

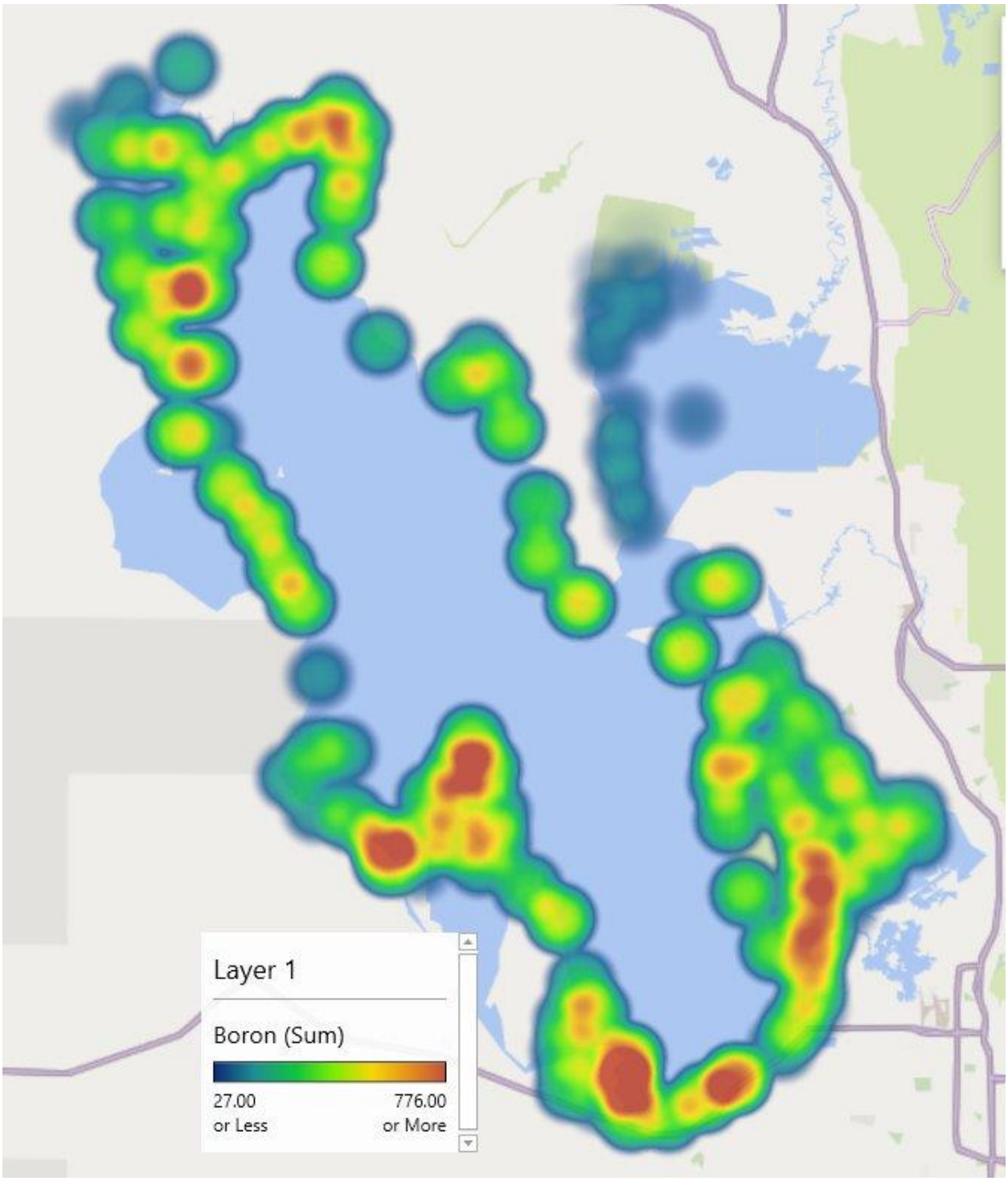

Figure H.6 Map showing the spatial distribution of boron (mg/kg) in the PM_{10} fraction of the soil.

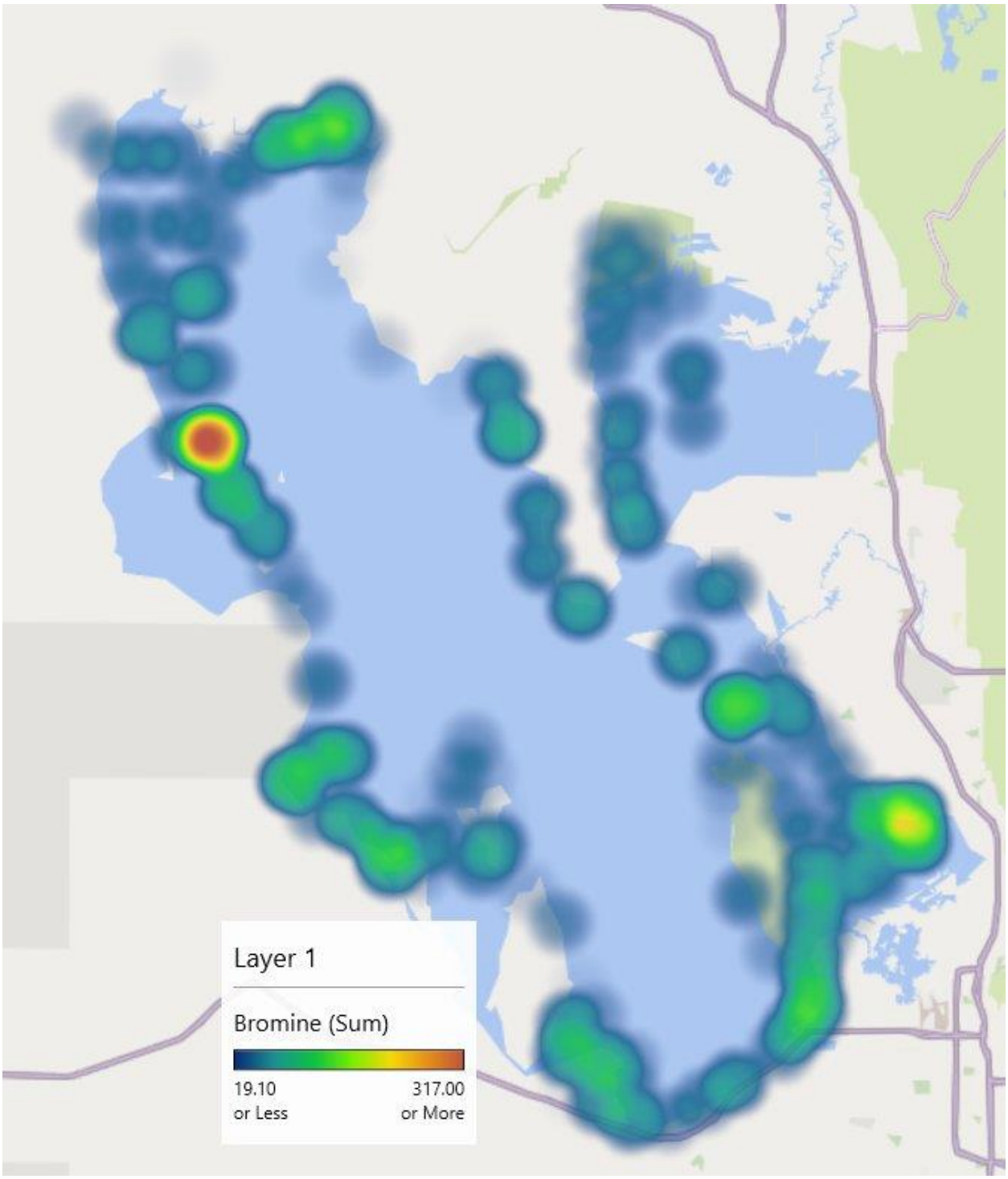

Figure H.7 Map showing the spatial distribution of bromine (mg/kg) in the PM_{10} fraction of the soil.

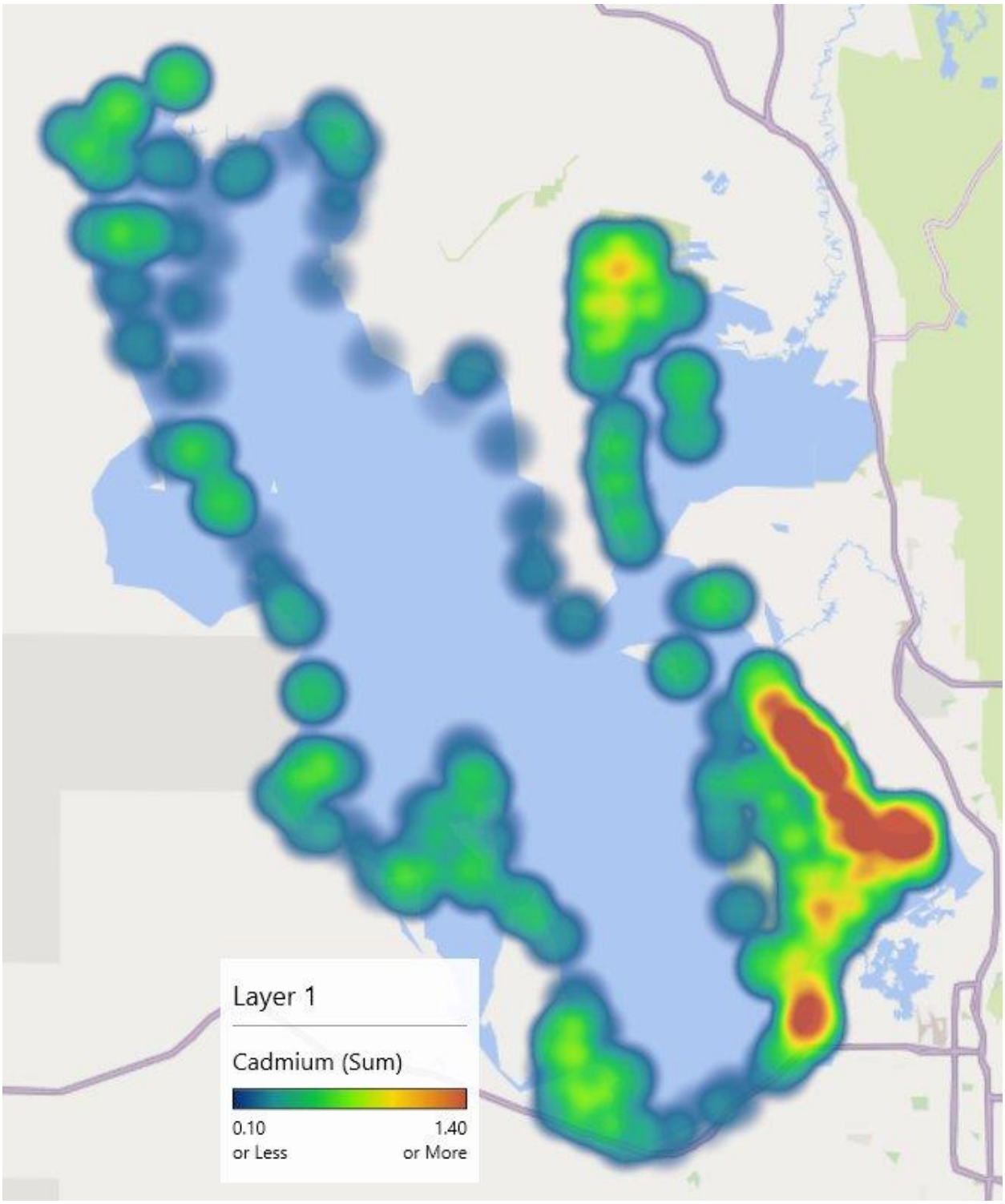

Figure H.8 Map showing the spatial distribution of cadmium (mg/kg) in the PM_{10} fraction of the soil.

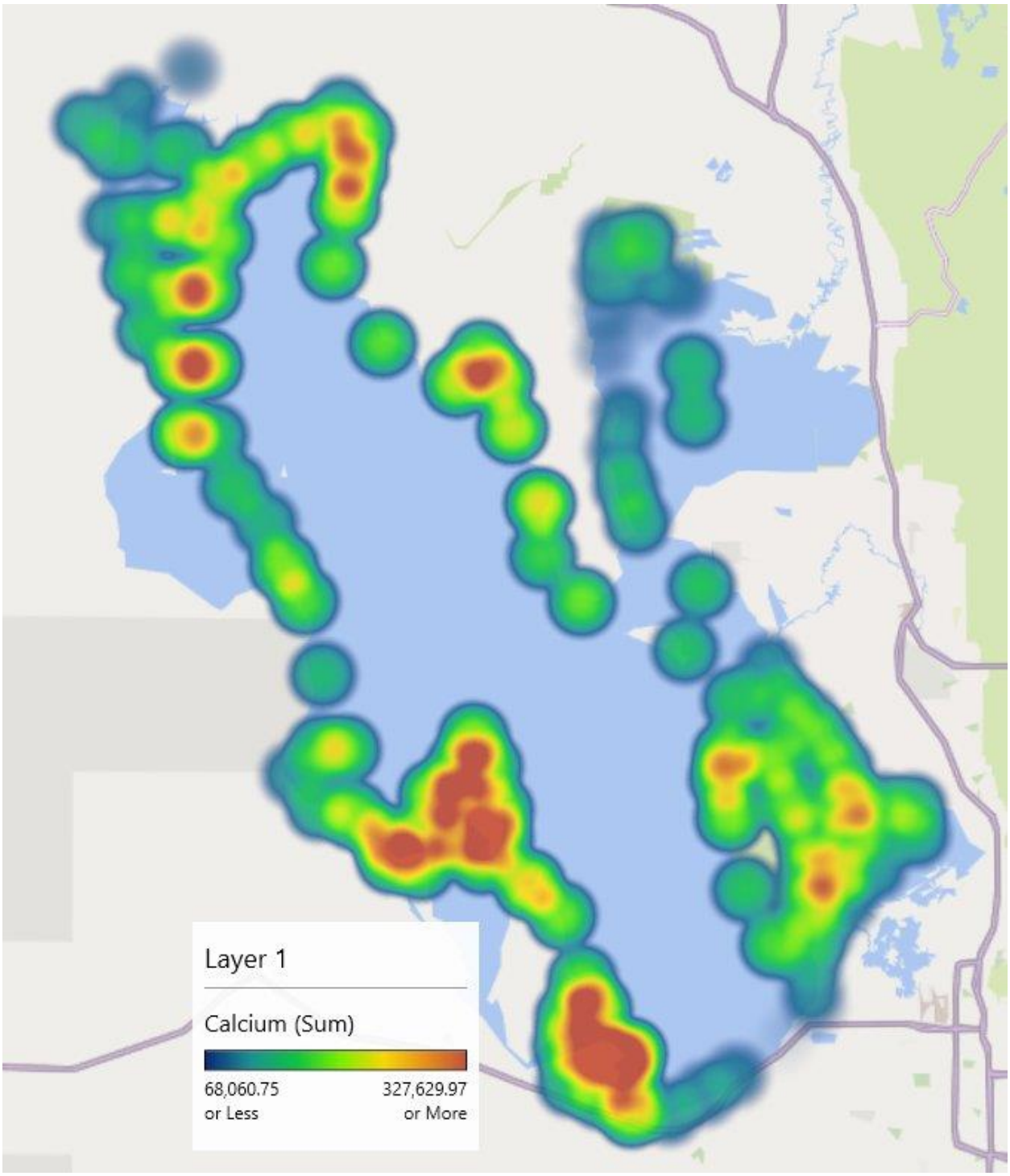

Figure H.9 Map showing the spatial distribution of calcium (mg/kg) in the PM_{10} fraction of the soil.

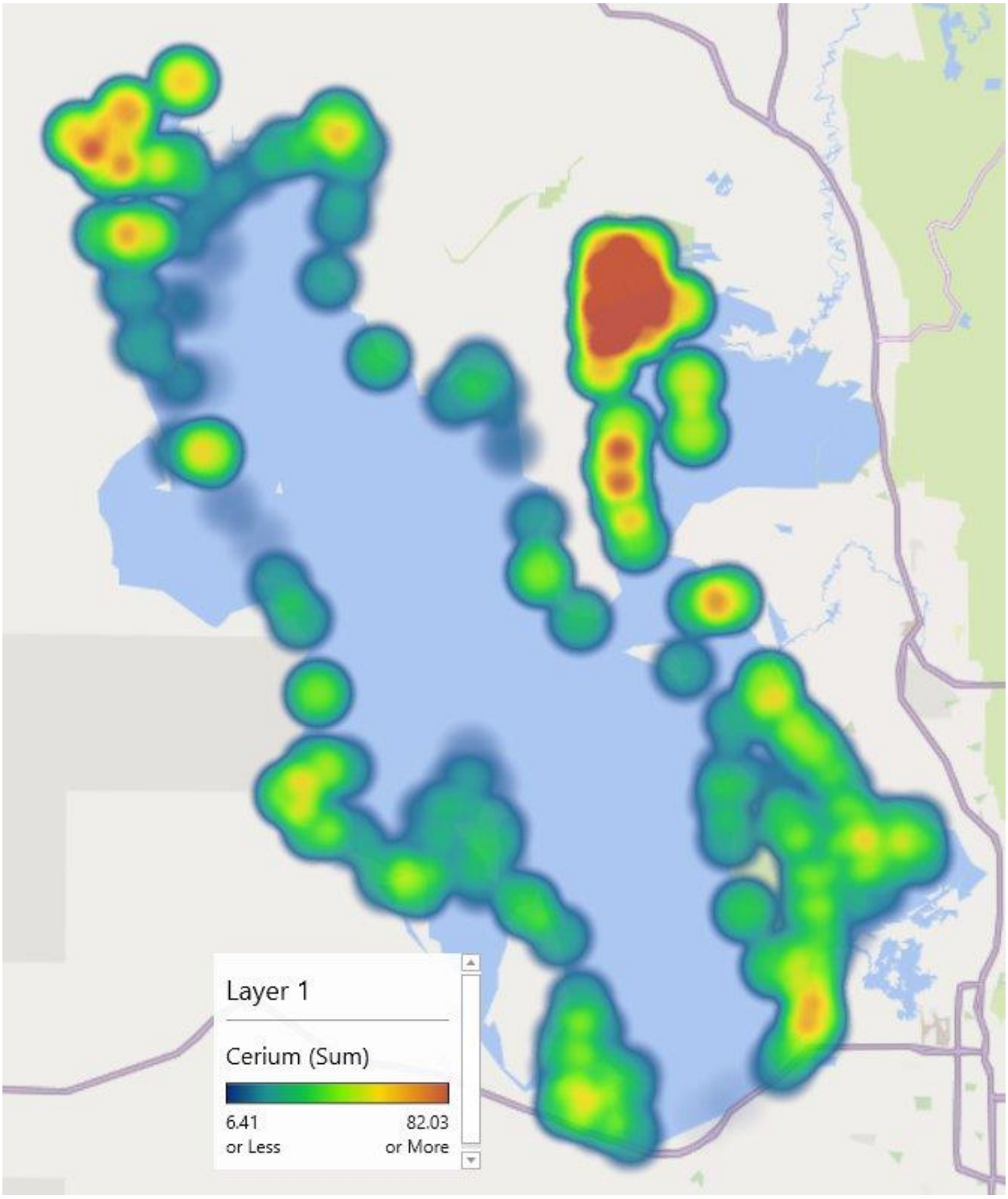

Figure H.10 Map showing the spatial distribution of cerium (mg/kg) in the PM_{10} fraction of the soil.

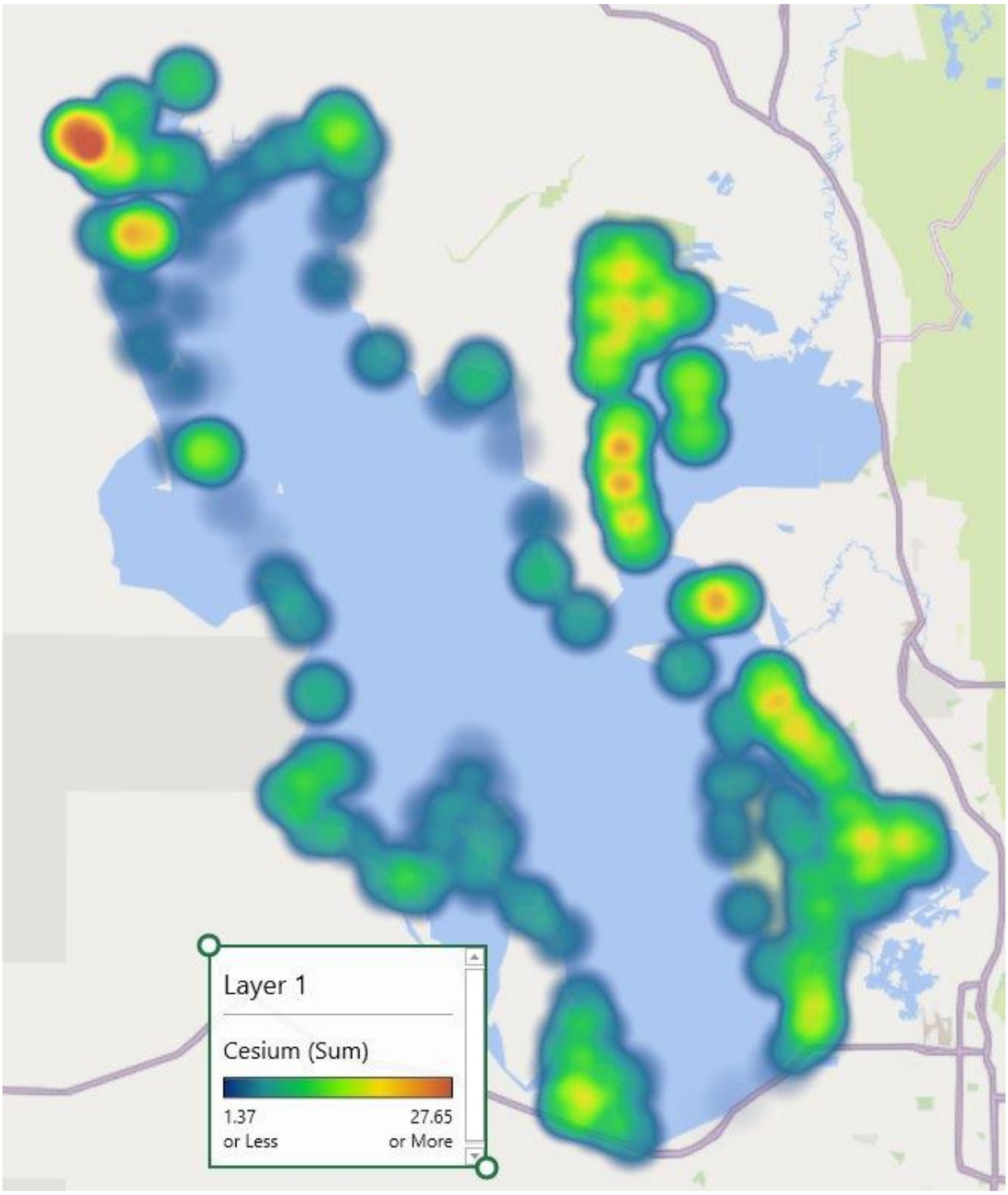

Figure H.11 Map showing the spatial distribution of cesium (mg/kg) in the PM_{10} fraction of the soil.

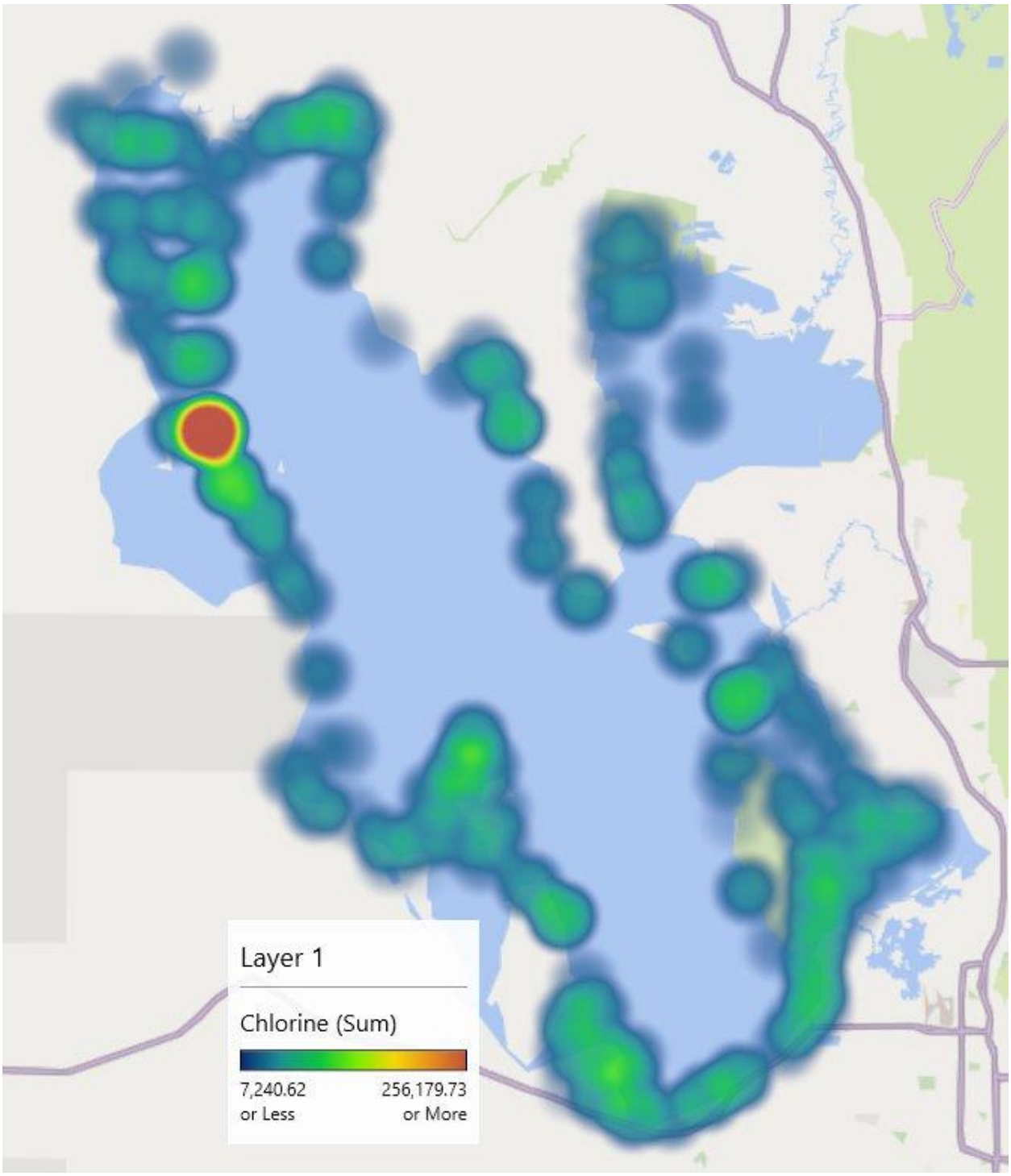

Figure H.12 Map showing the spatial distribution of chlorine (mg/kg) in the PM_{10} fraction of the soil.

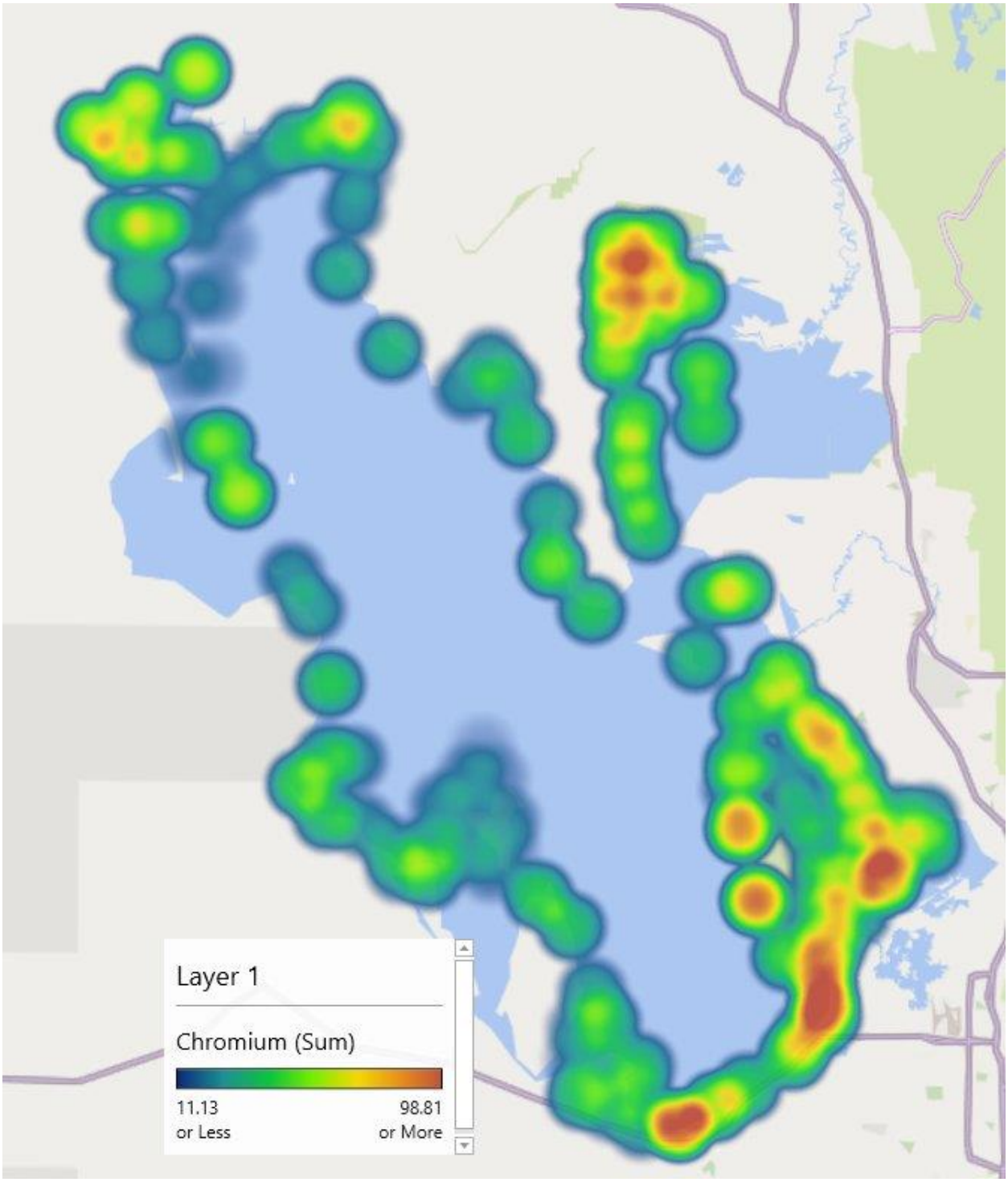

Figure H.13 Map showing the spatial distribution of chromium (mg/kg) in the PM_{10} fraction of the soil.

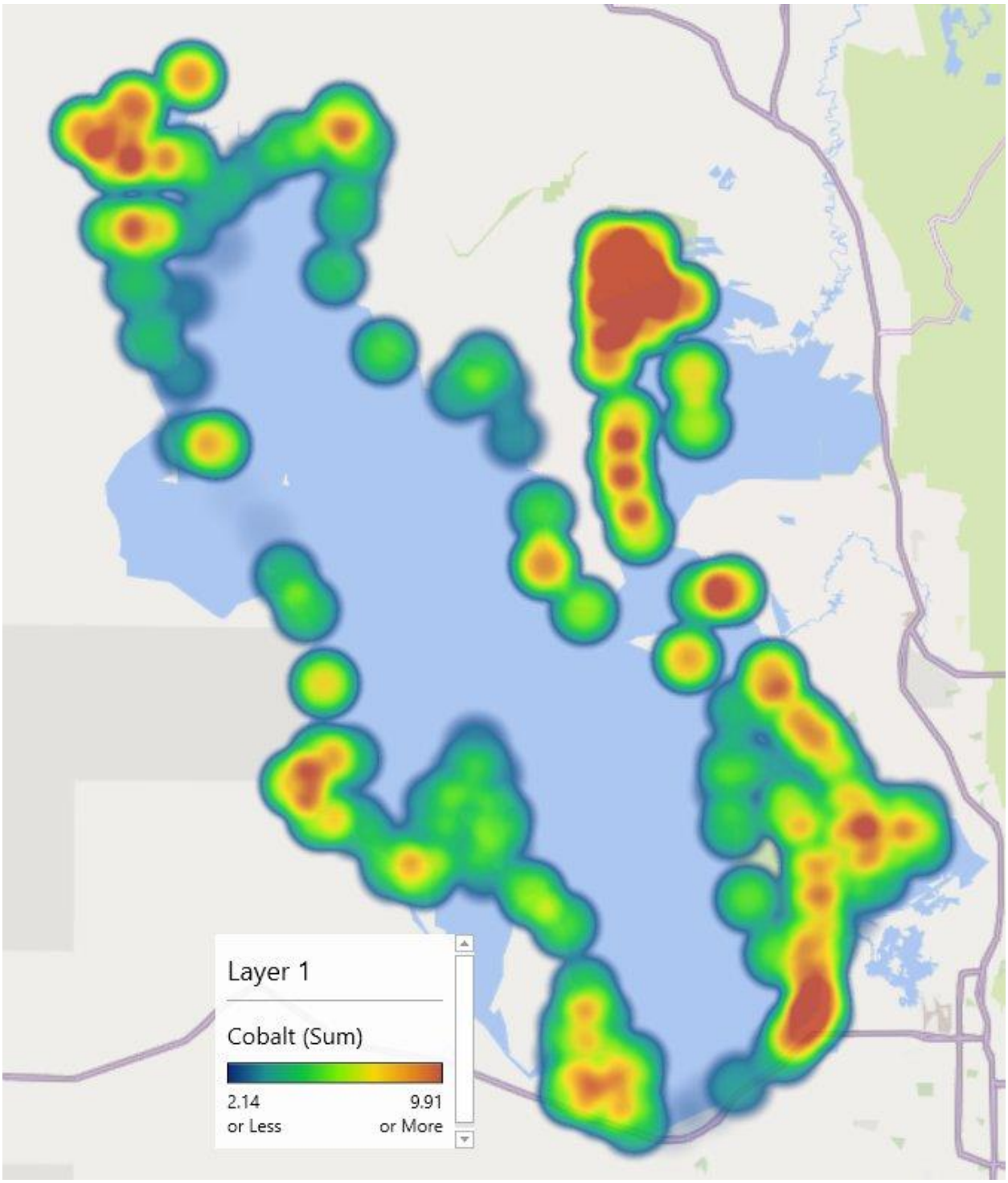

Figure H.14 Map showing the spatial distribution of cobalt (mg/kg) in the PM_{10} fraction of the soil.

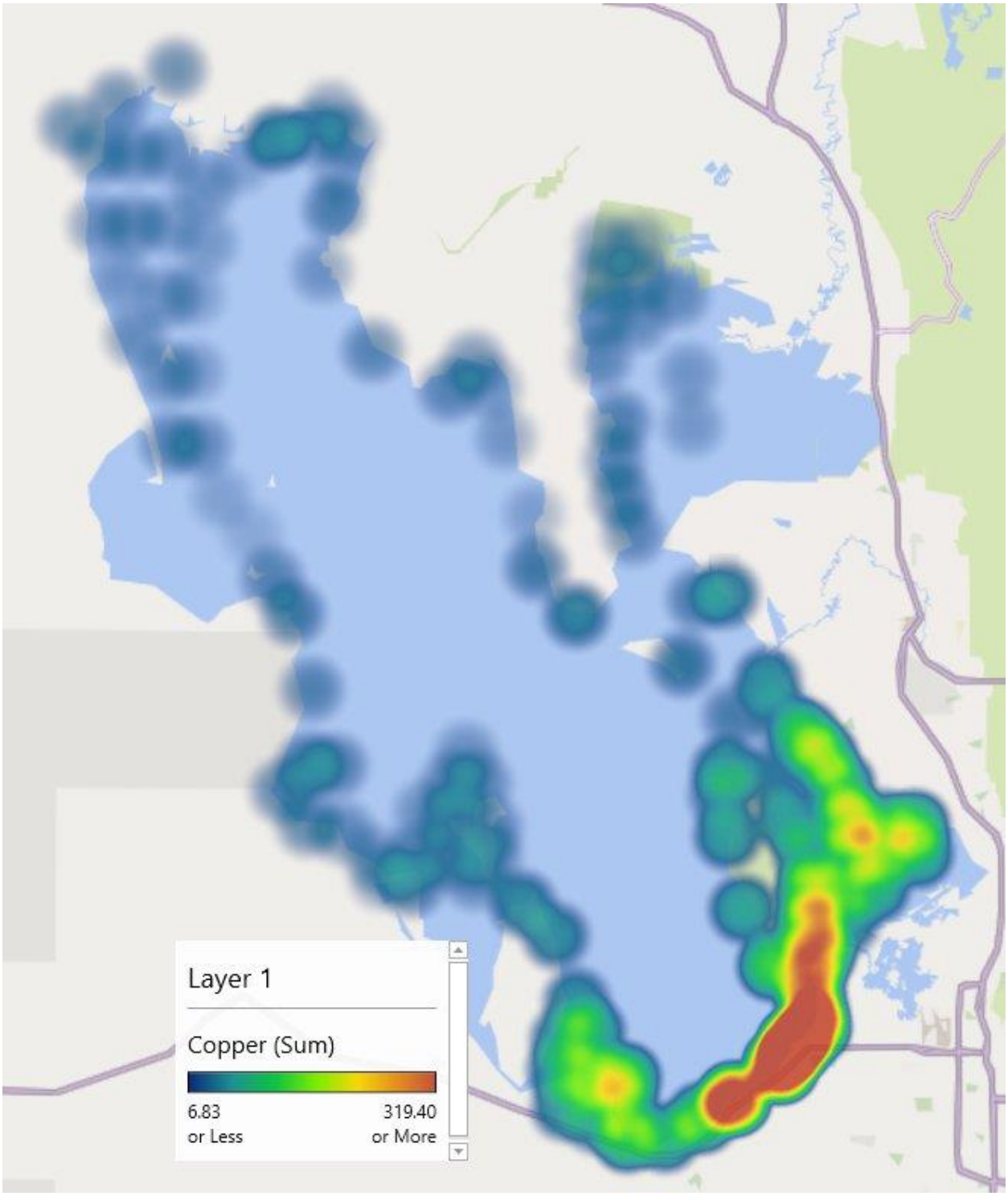

Figure H.15 Map showing the spatial distribution of copper (mg/kg) in the PM_{10} fraction of the soil.

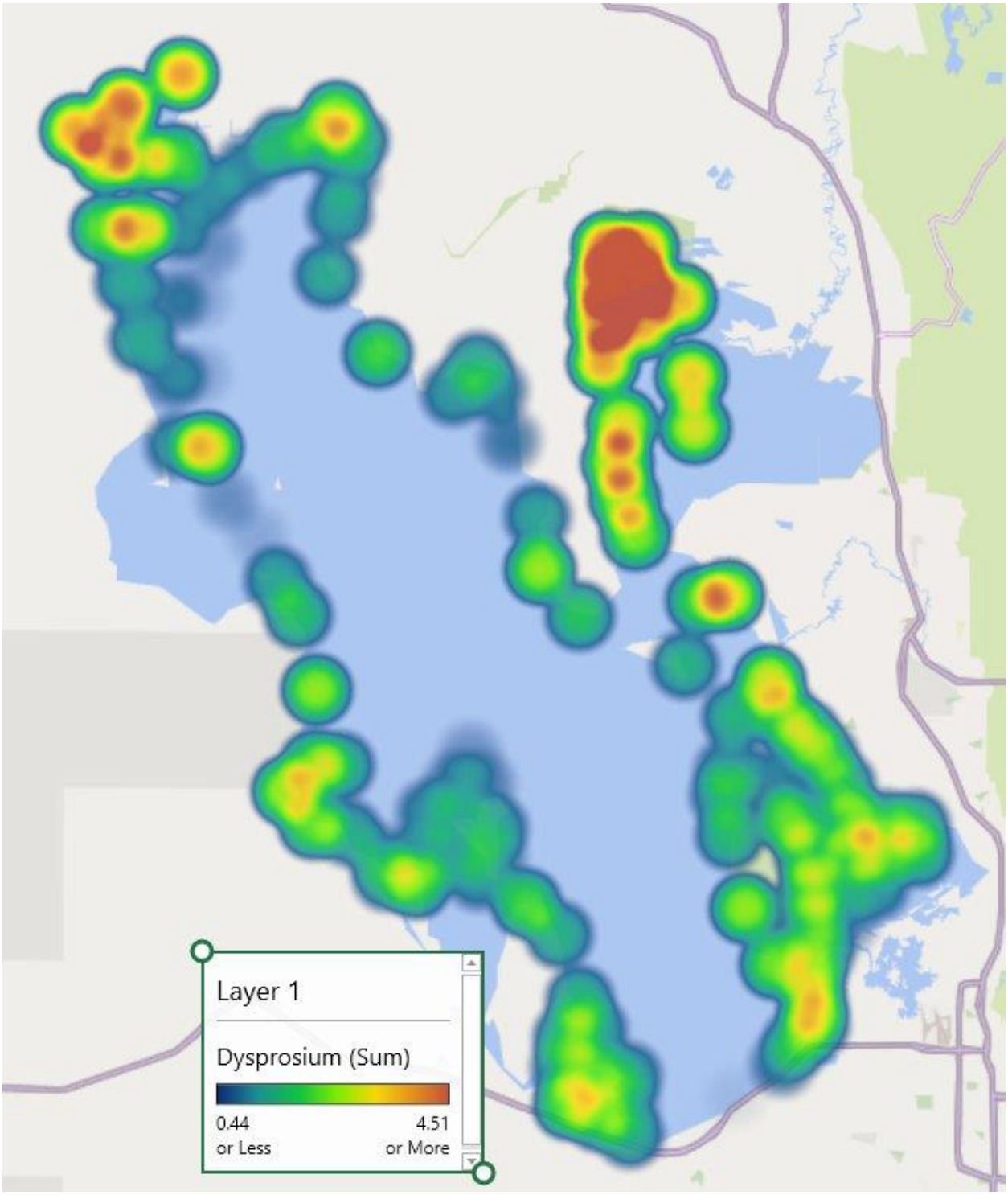

Figure H.16 Map showing the spatial distribution of dysprosium (mg/kg) in the PM_{10} fraction of the soil.

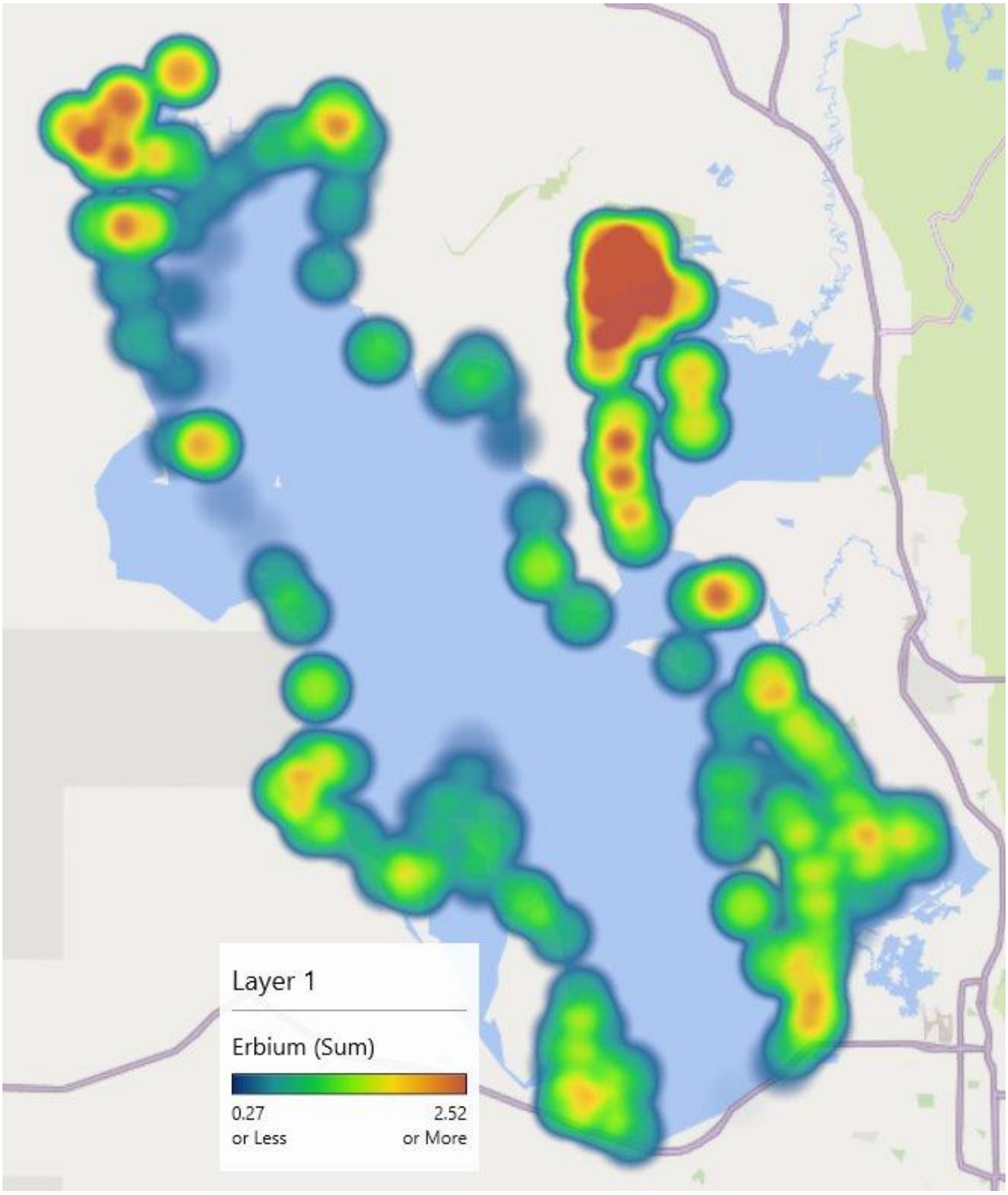

Figure H.17 Map showing the spatial distribution of erbium (mg/kg) in the PM_{10} fraction of the soil.

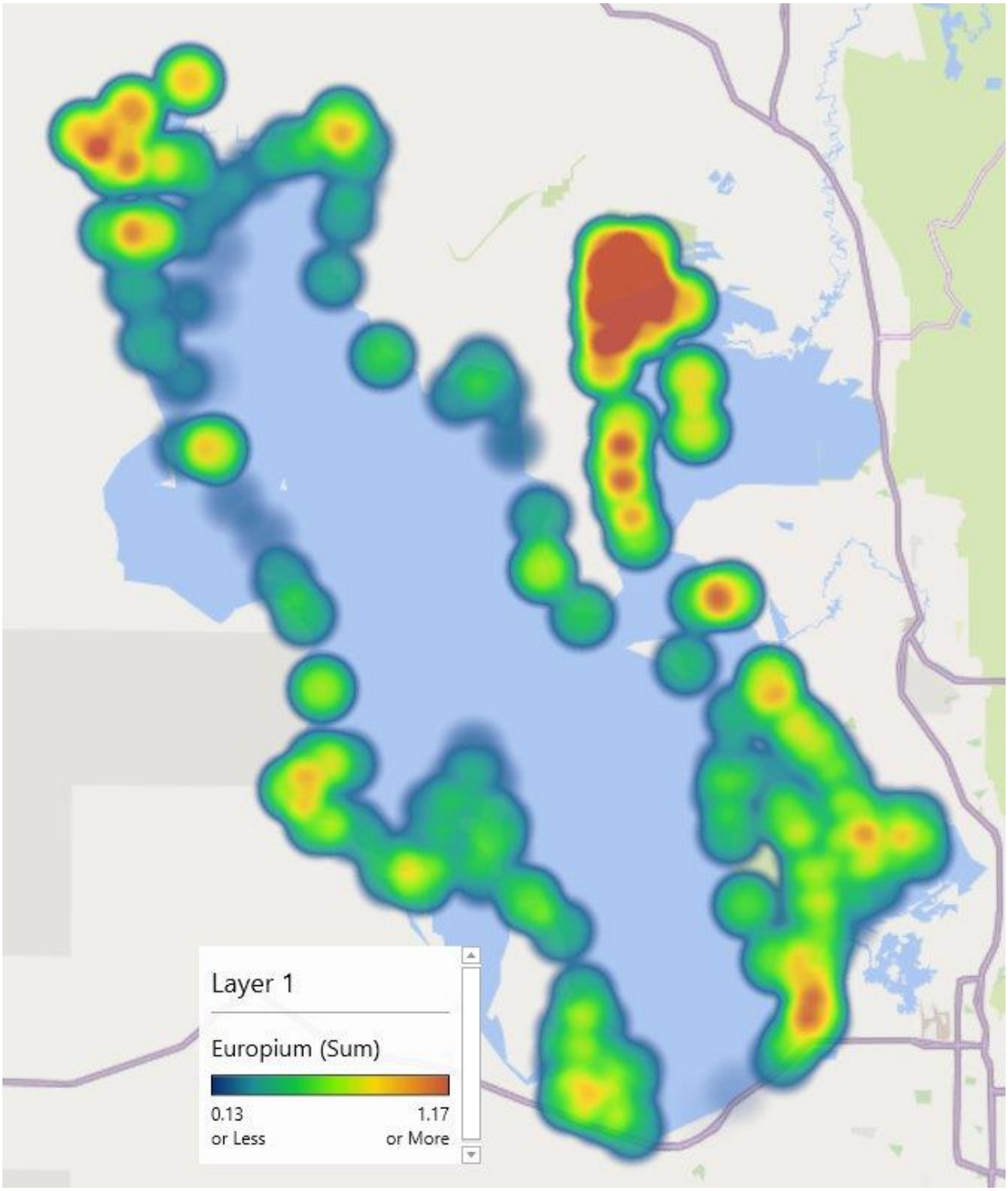

Figure H.18 Map showing the spatial distribution of europium (mg/kg) in the PM_{10} fraction of the soil.

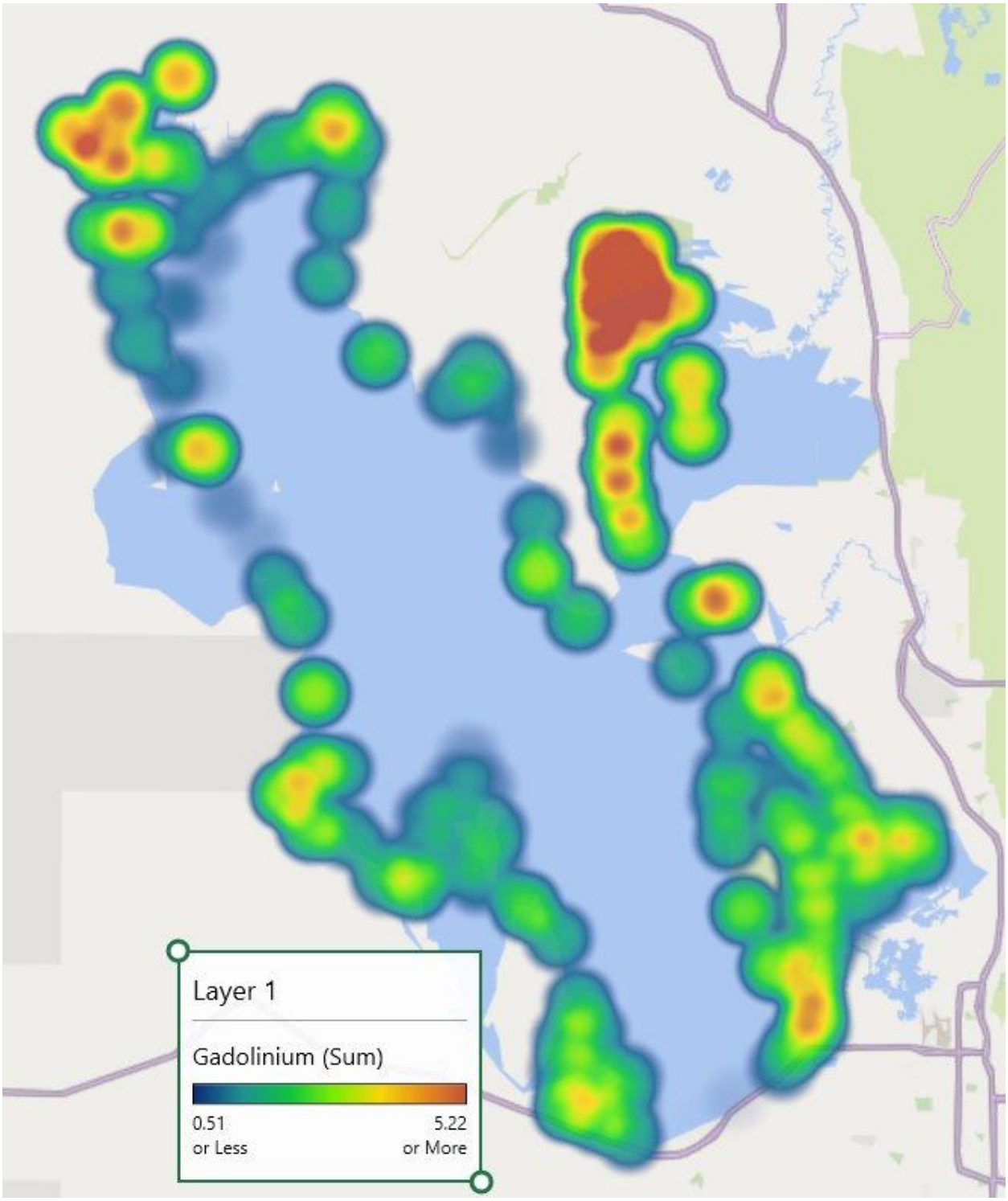

Figure H.19 Map showing the spatial distribution of gadolinium (mg/kg) in the PM_{10} fraction of the soil.

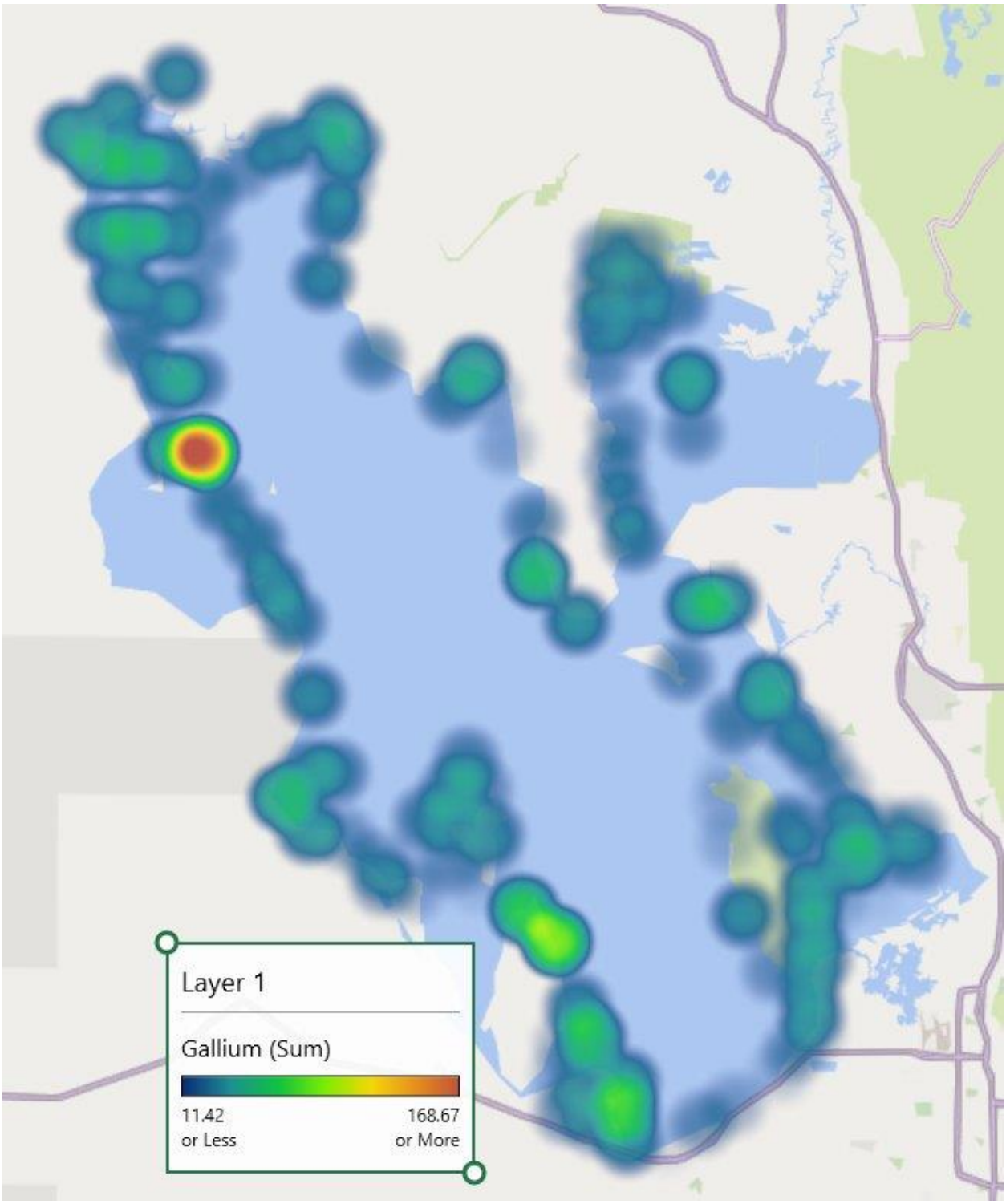

Figure H.20 Map showing the spatial distribution of gallium (mg/kg) in the PM_{10} fraction of the soil.

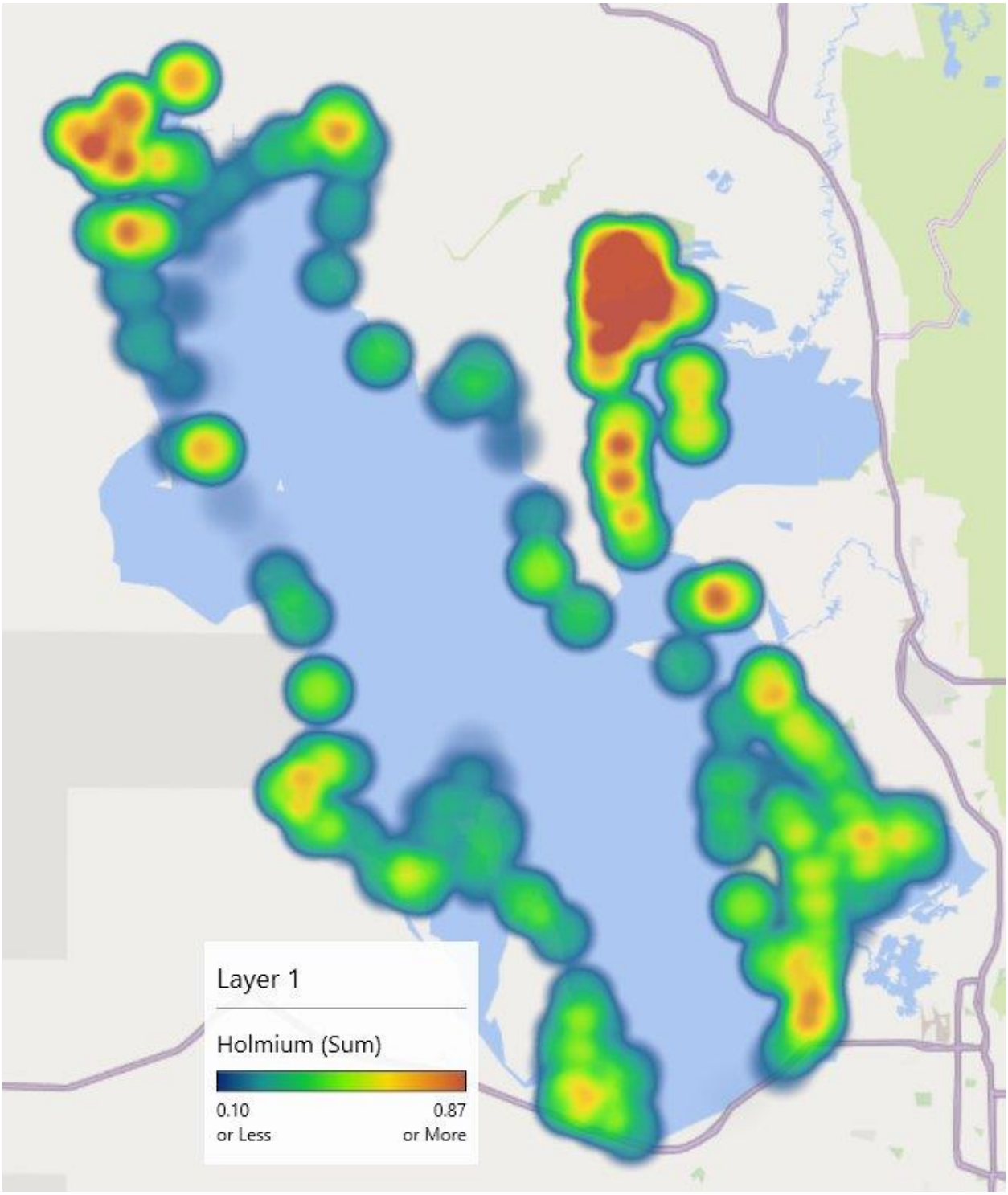

Figure H.21 Map showing the spatial distribution of holmium (mg/kg) in the PM_{10} fraction of the soil.

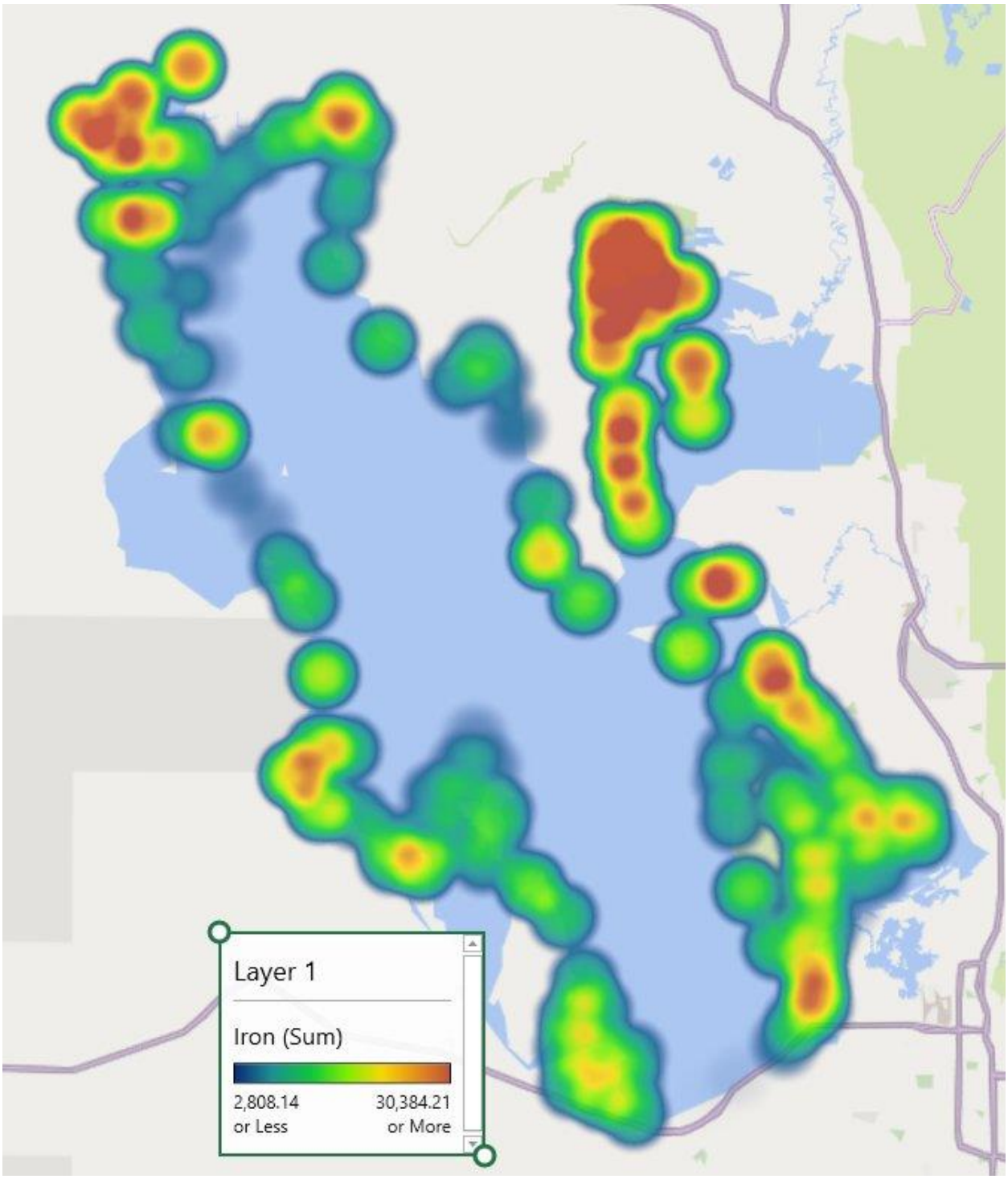

Figure H.22 Map showing the spatial distribution of iron (mg/kg) in the PM_{10} fraction of the soil.

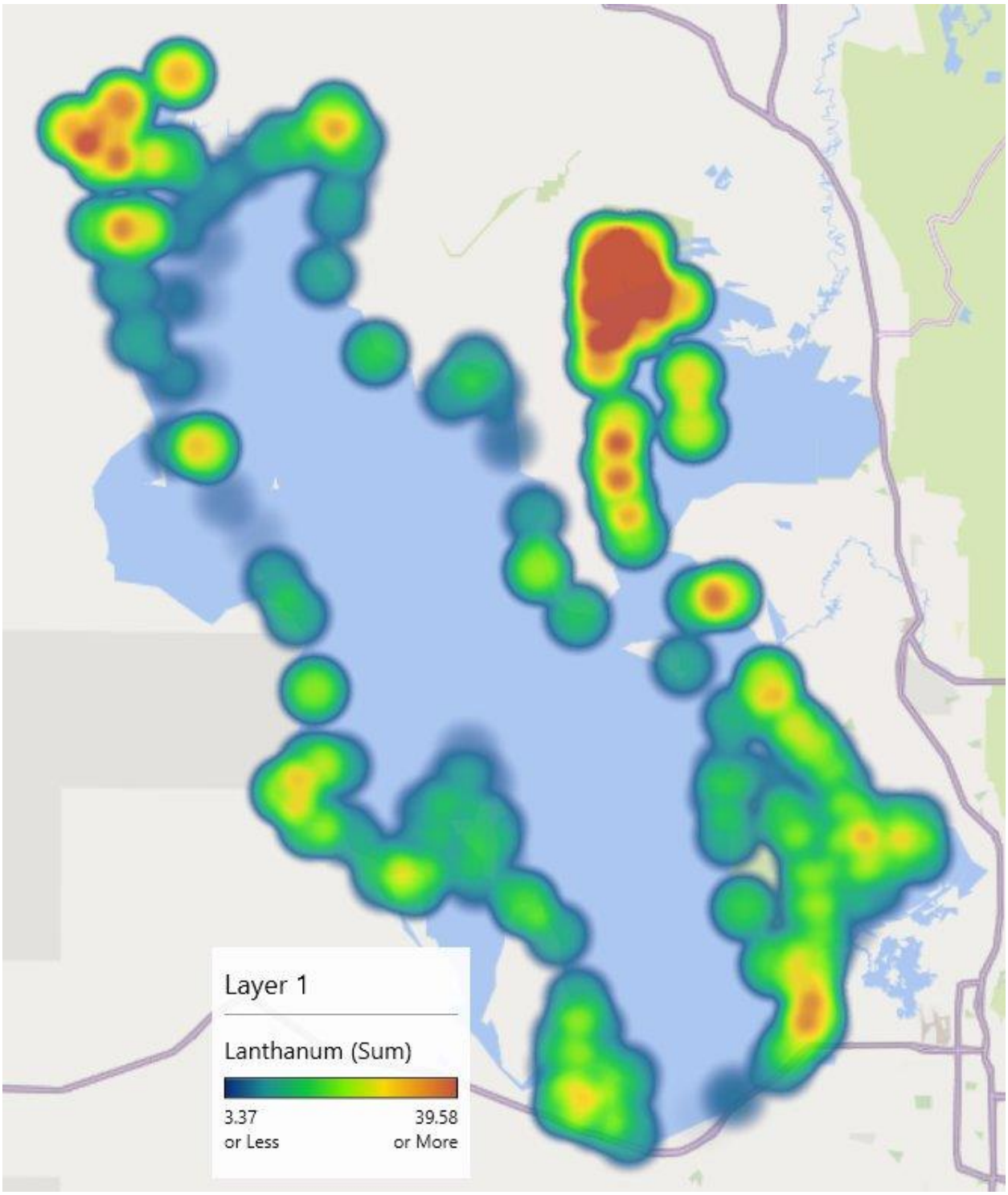

Figure H.23 Map showing the spatial distribution of lanthanum (mg/kg) in the PM_{10} fraction of the soil.

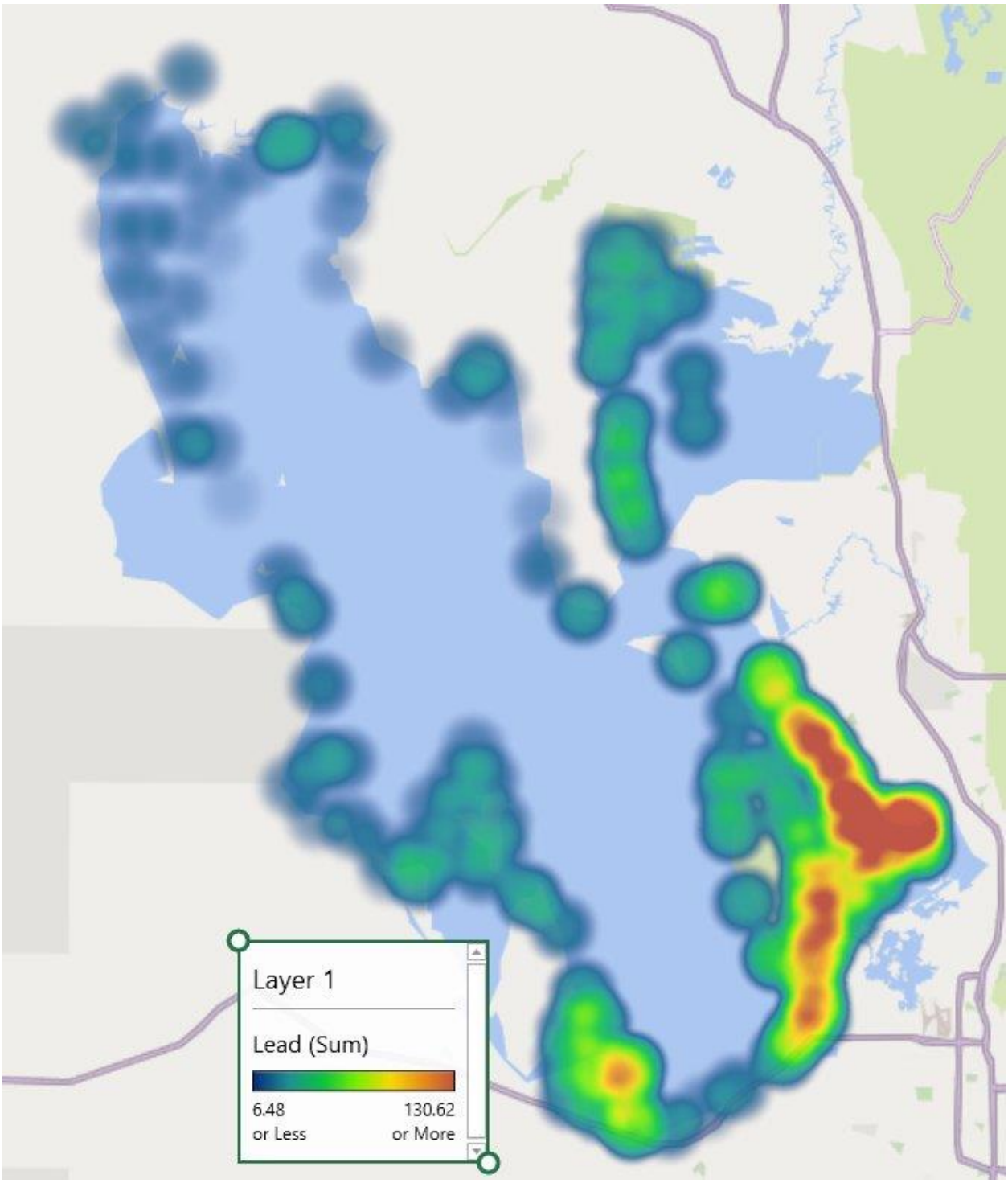

Figure H.24 Map showing the spatial distribution of lead (mg/kg) in the PM_{10} fraction of the soil.

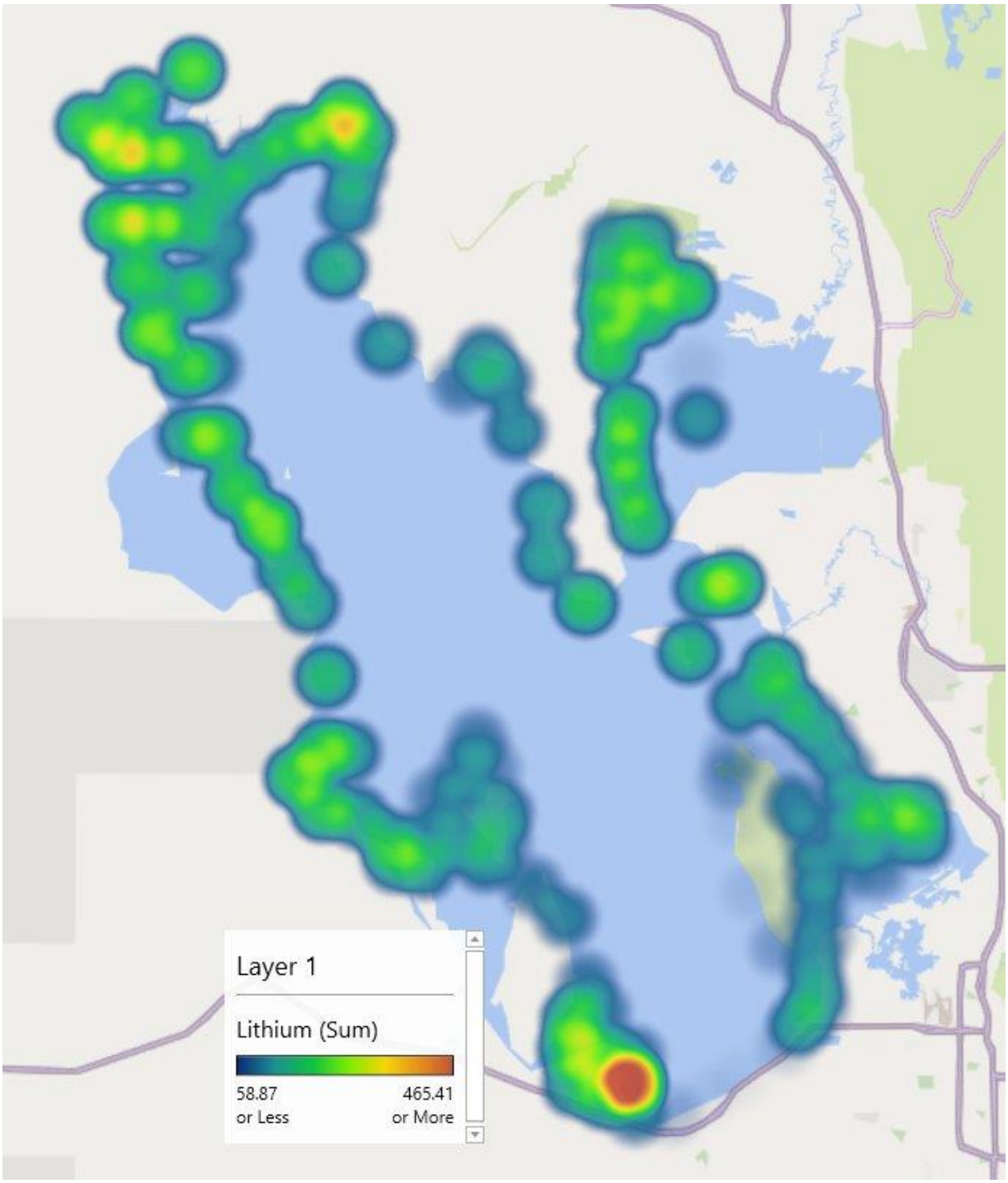

Figure H.25 Map showing the spatial distribution of lithium (mg/kg) in the PM_{10} fraction of the soil.

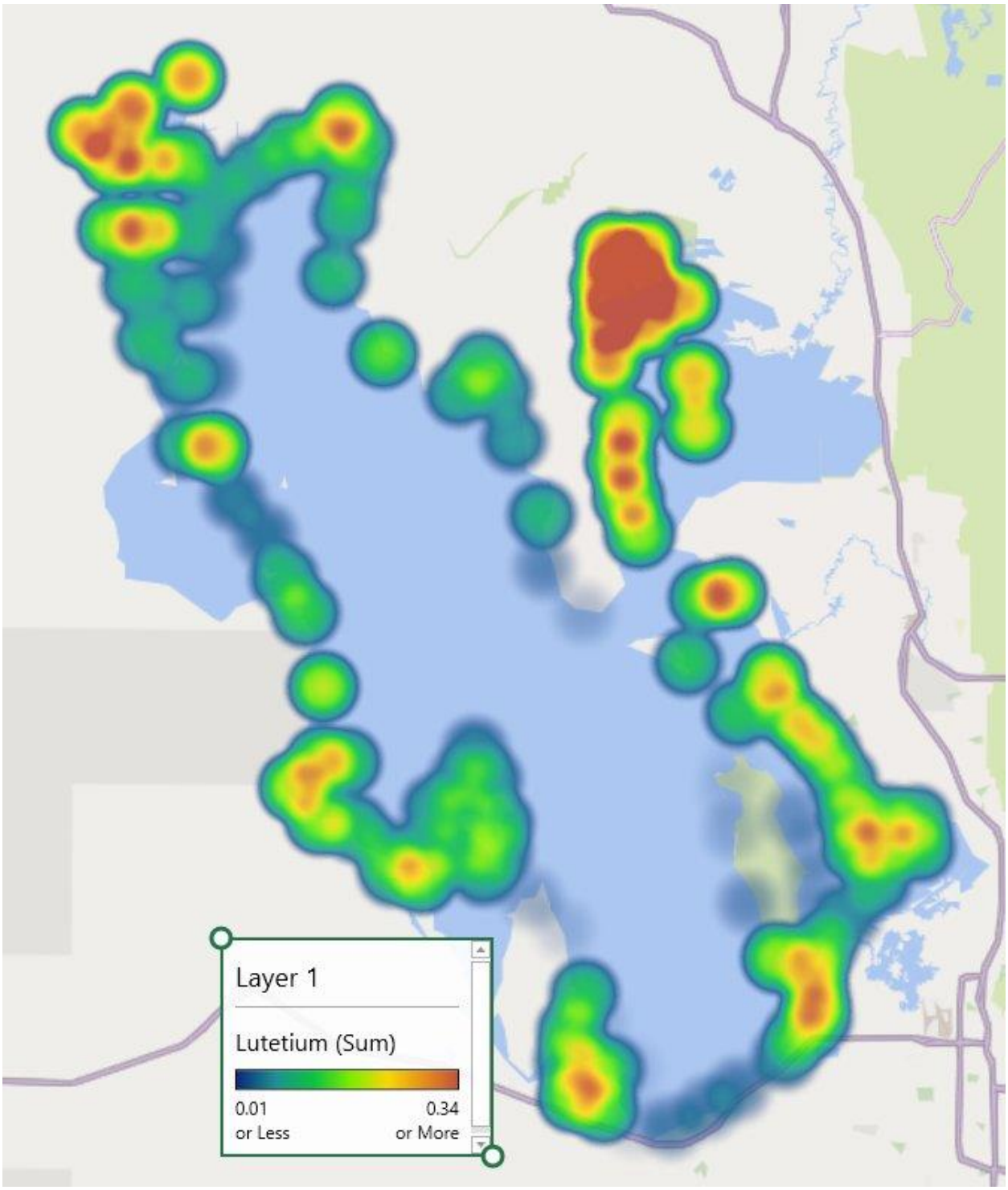

Figure H.26 Map showing the spatial distribution of lutetium (mg/kg) in the PM_{10} fraction of the soil.

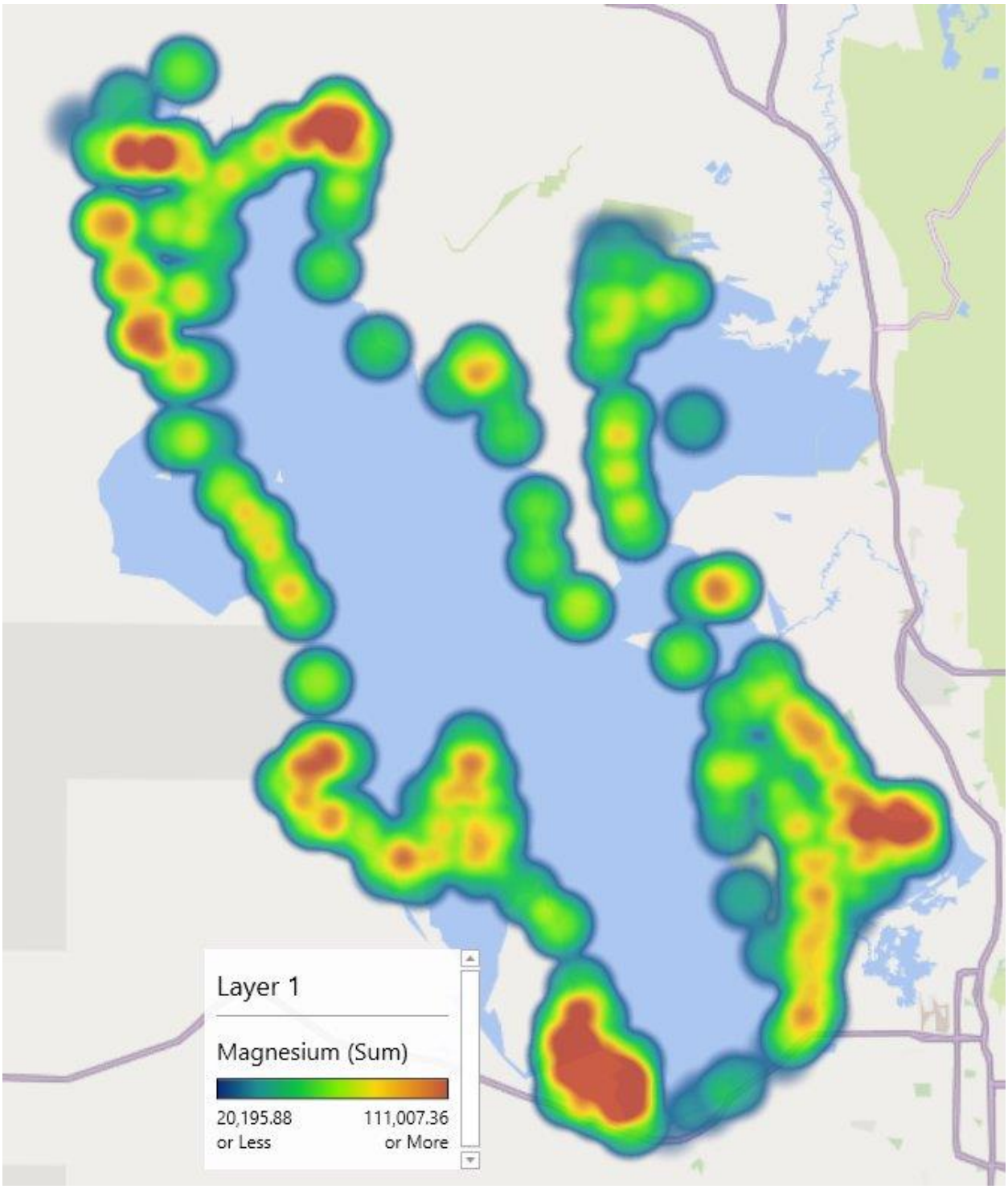

Figure H.27 Map showing the spatial distribution of magnesium (mg/kg) in the PM_{10} fraction of the soil.

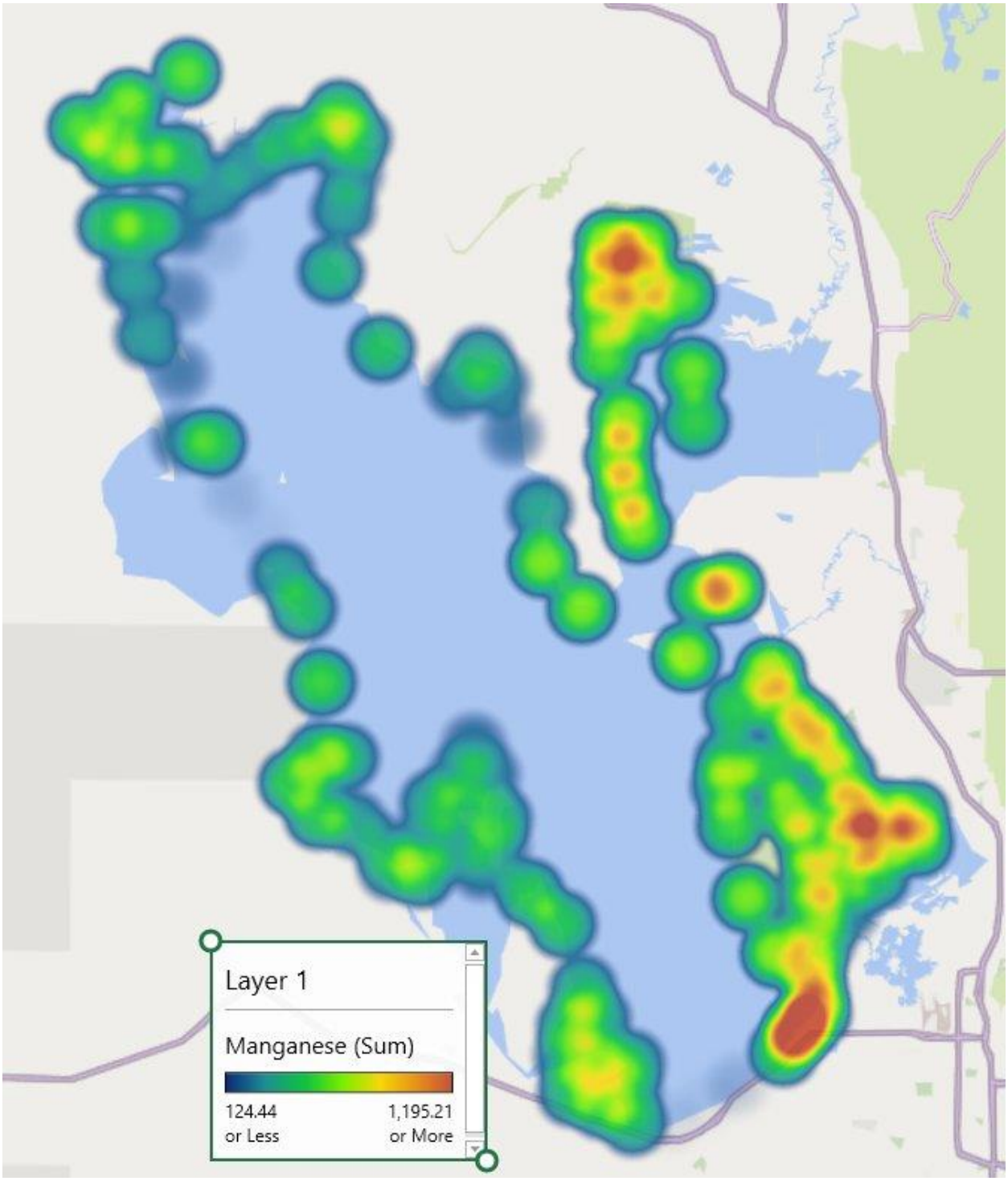

Figure H.28 Map showing the spatial distribution of manganese (mg/kg) in the PM_{10} fraction of the soil.

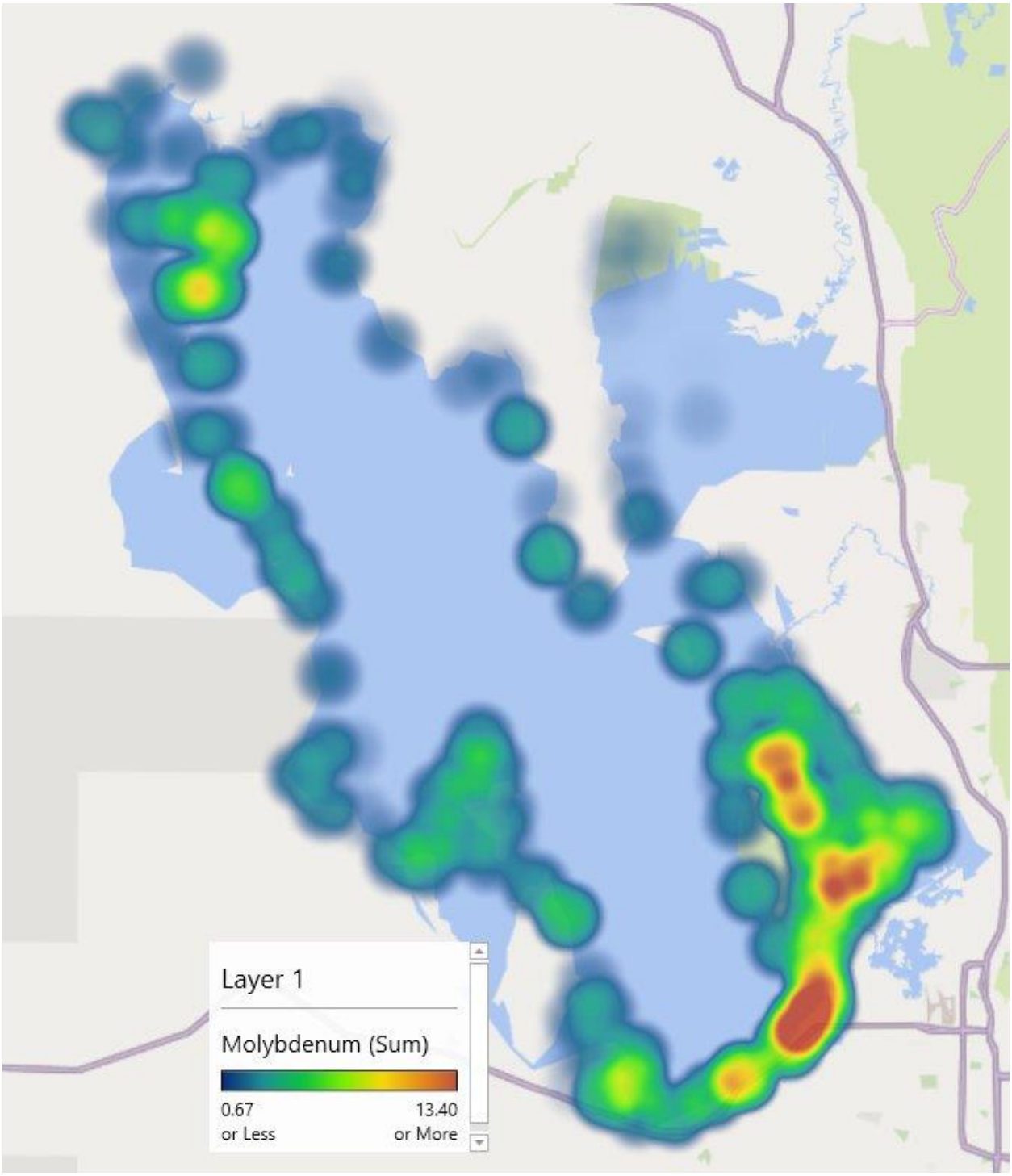

Figure H.29 Map showing the spatial distribution of molybdenum (mg/kg) in the PM_{10} fraction of the soil.

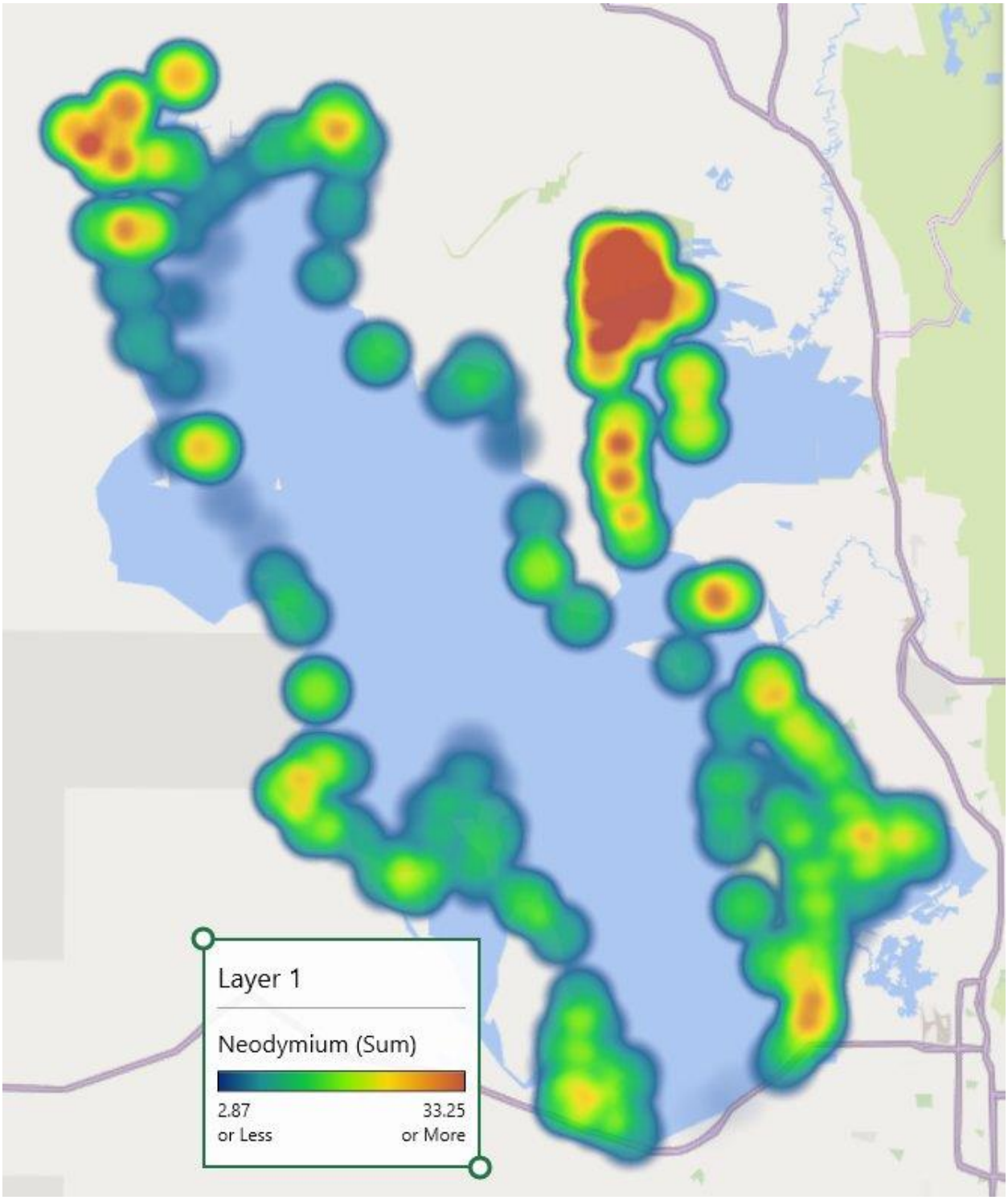

Figure H.30 Map showing the spatial distribution of neodymium (mg/kg) in the PM_{10} fraction of the soil.

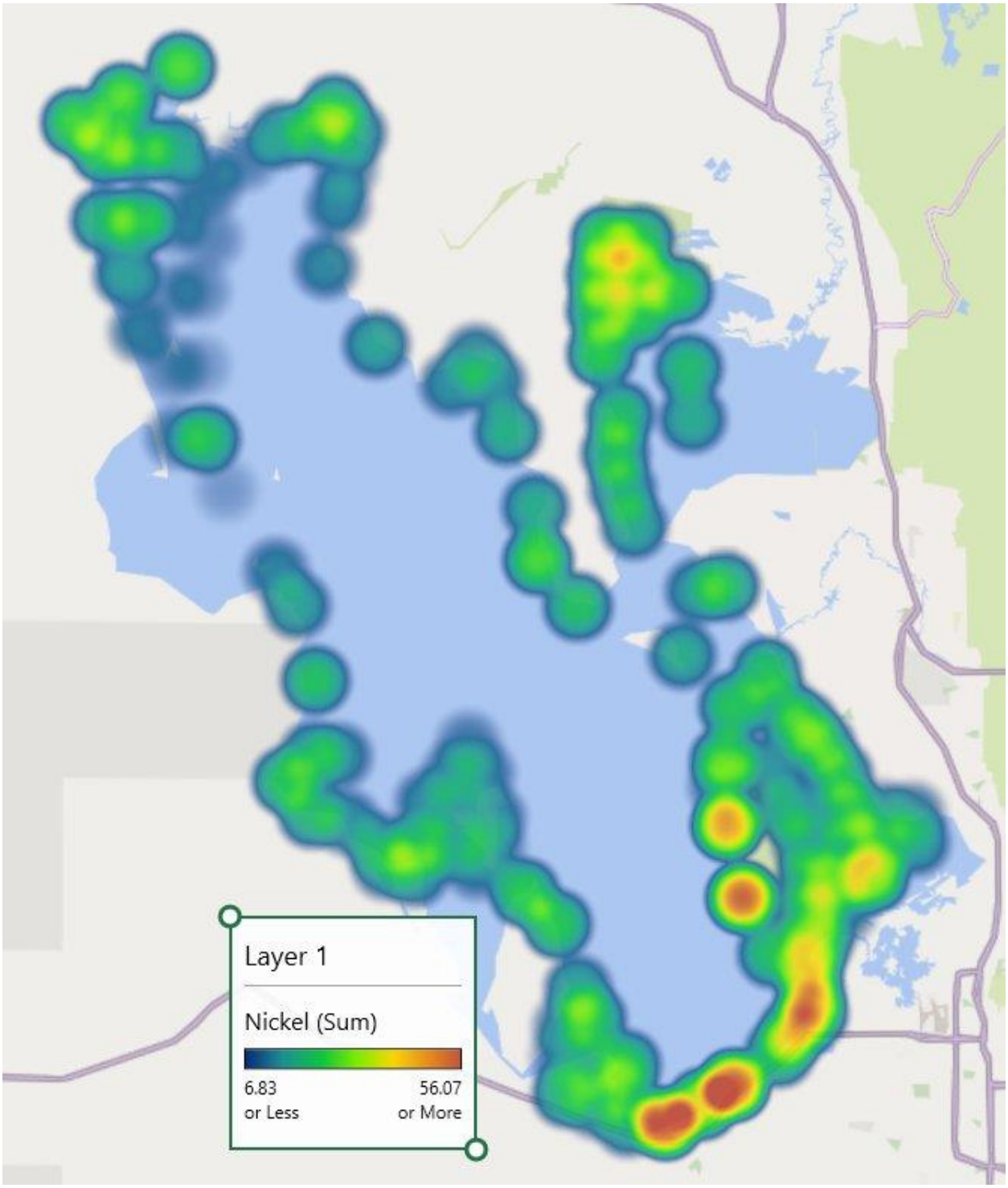

Figure H.31 Map showing the spatial distribution of nickel (mg/kg) in the PM_{10} fraction of the soil.

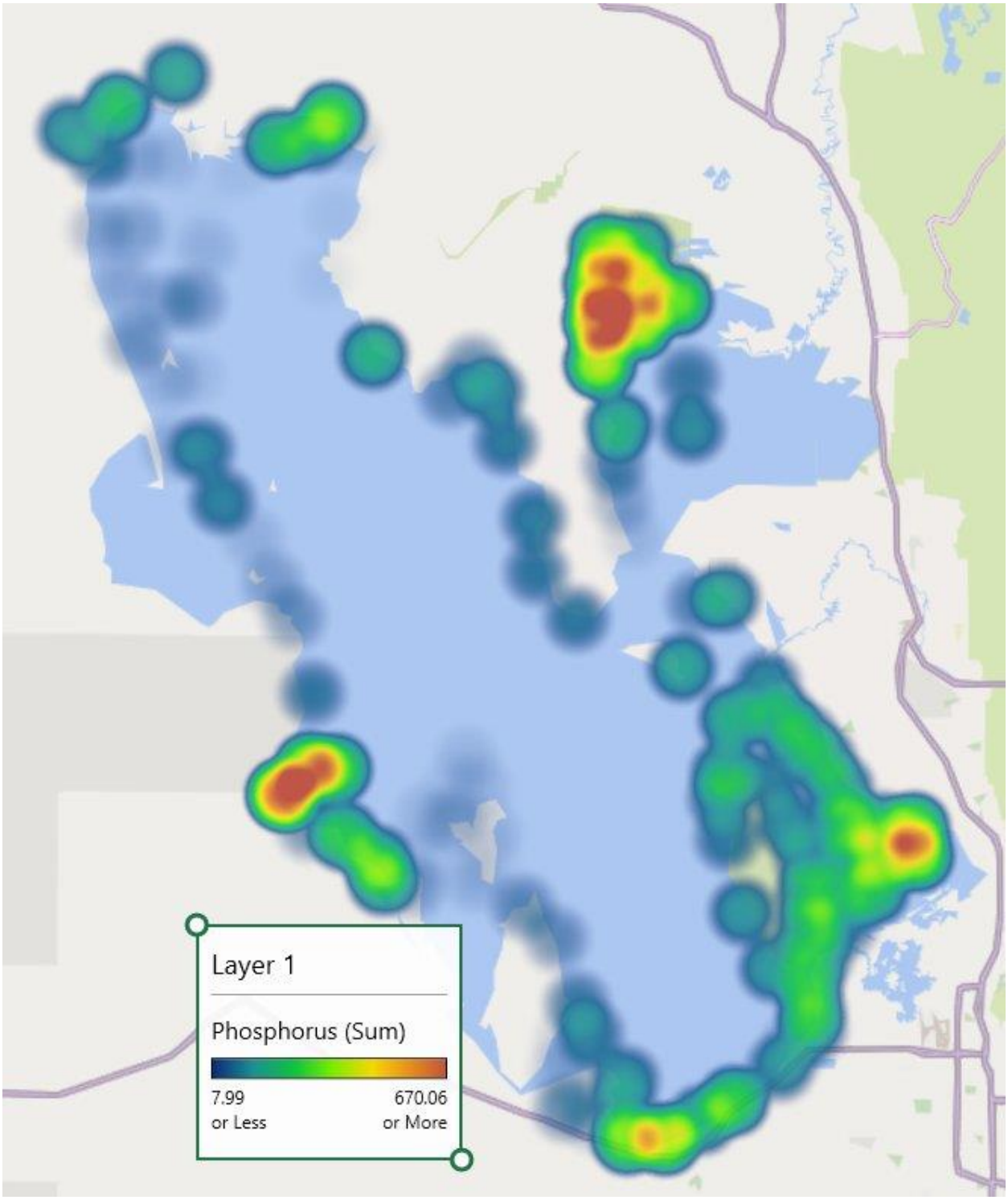

Figure H.32 Map showing the spatial distribution of phosphorus (mg/kg) in the PM_{10} fraction of the soil.

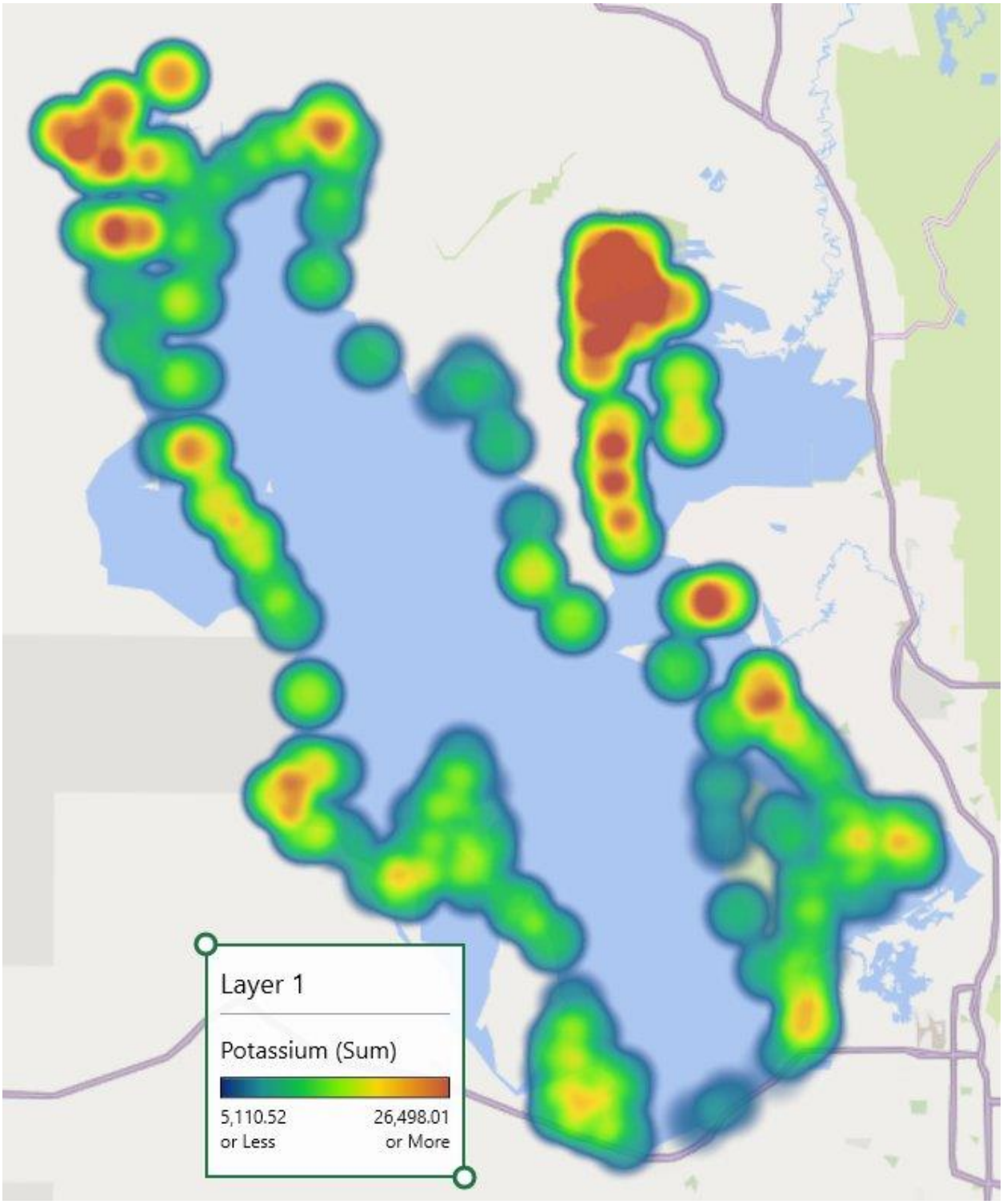

Figure H.33 Map showing the spatial distribution of potassium (mg/kg) in the PM_{10} fraction of the soil.

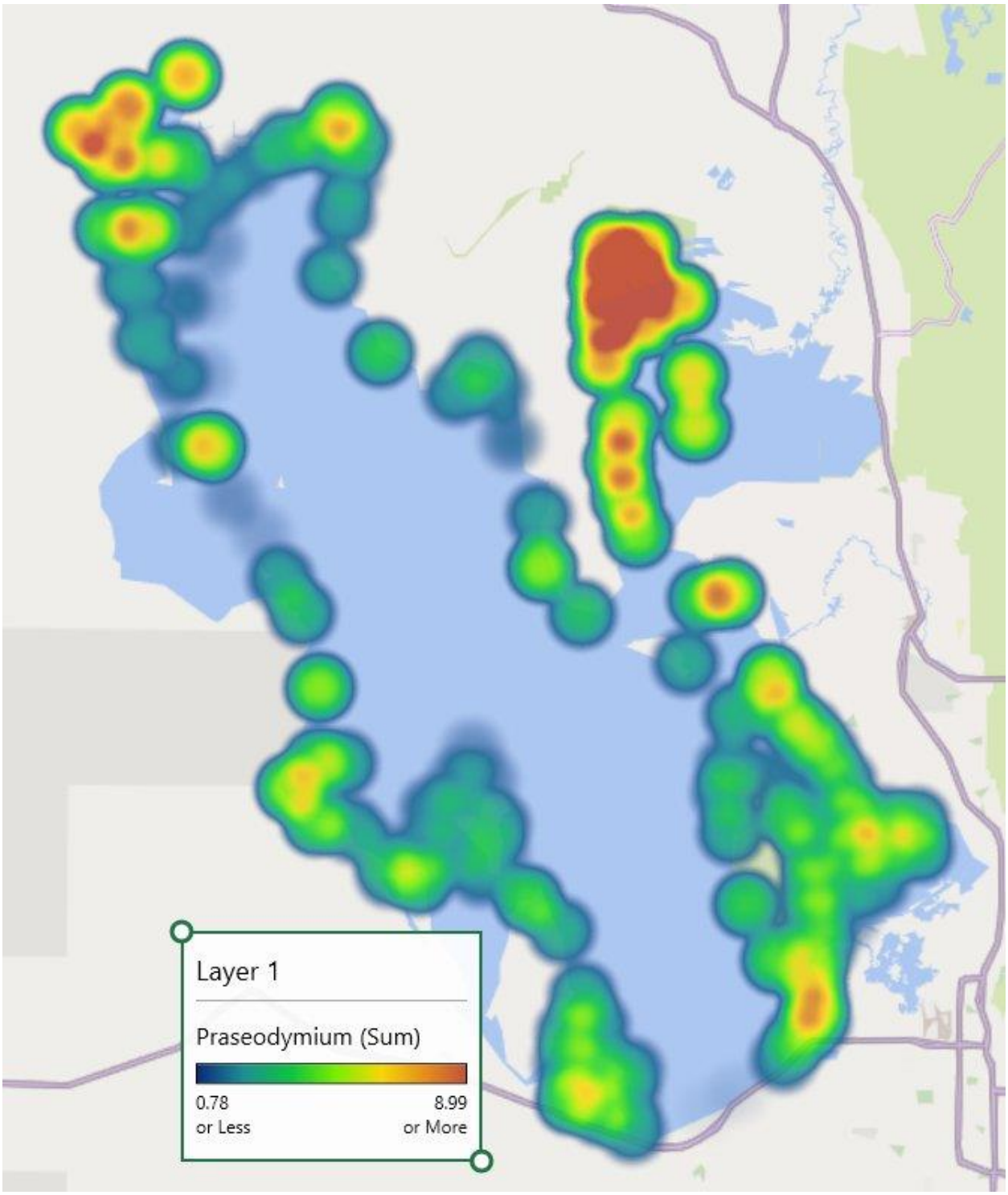

Figure H.34 Map showing the spatial distribution of praseodymium (mg/kg) in the PM_{10} fraction of the soil.

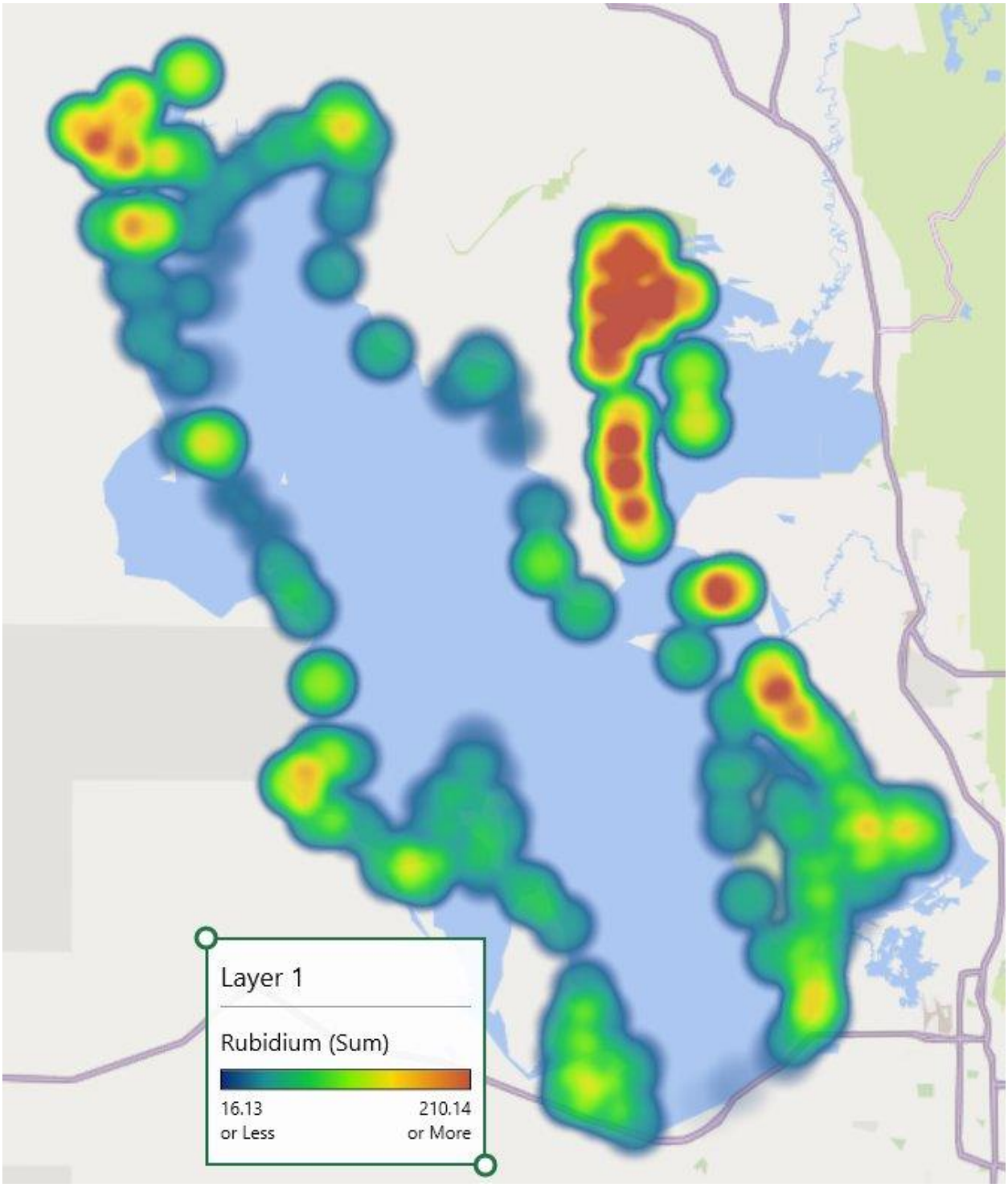

Figure H.35 Map showing the spatial distribution of rubidium (mg/kg) in the PM_{10} fraction of the soil.

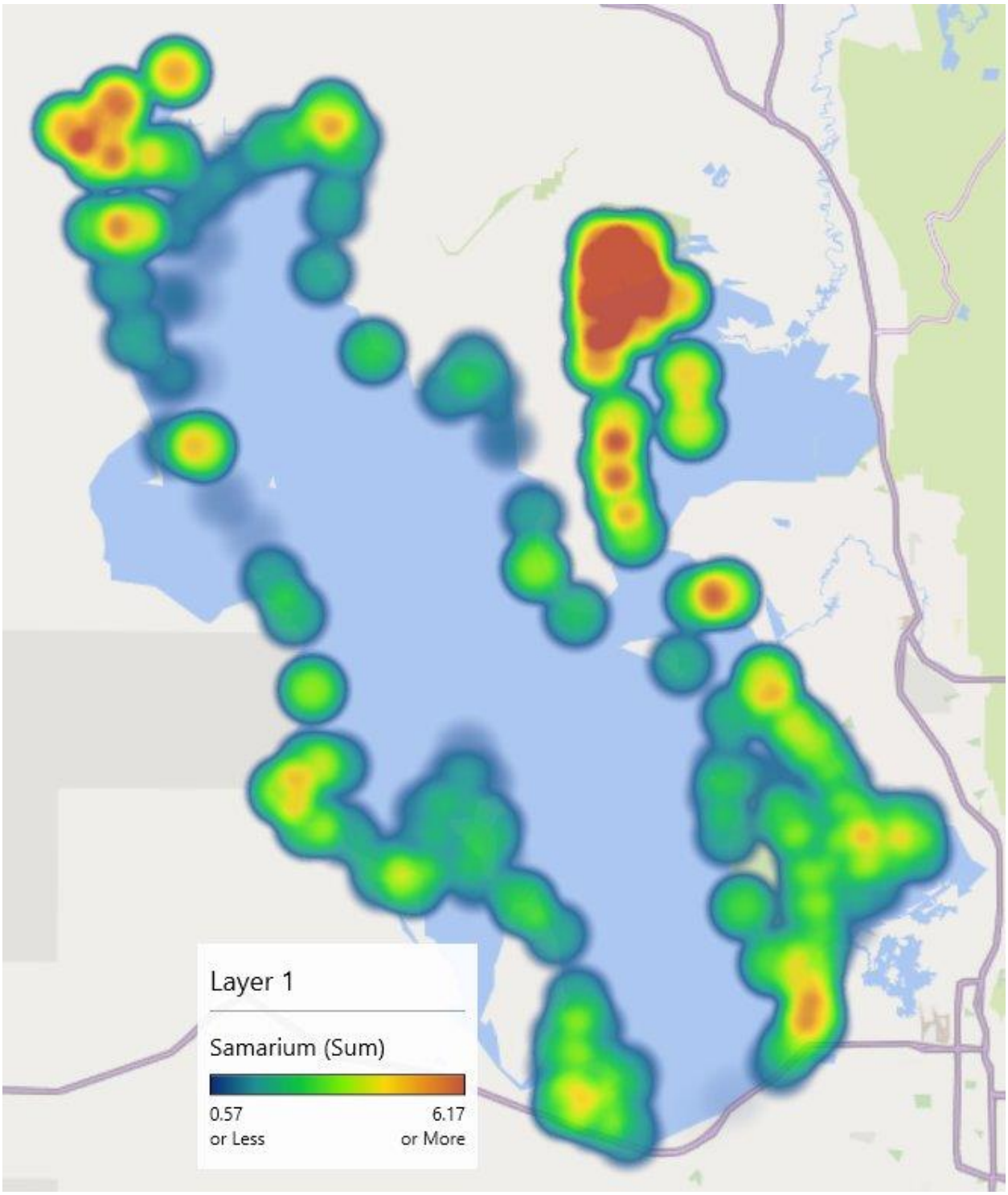

Figure H.36 Map showing the spatial distribution of samarium (mg/kg) in the PM_{10} fraction of the soil.

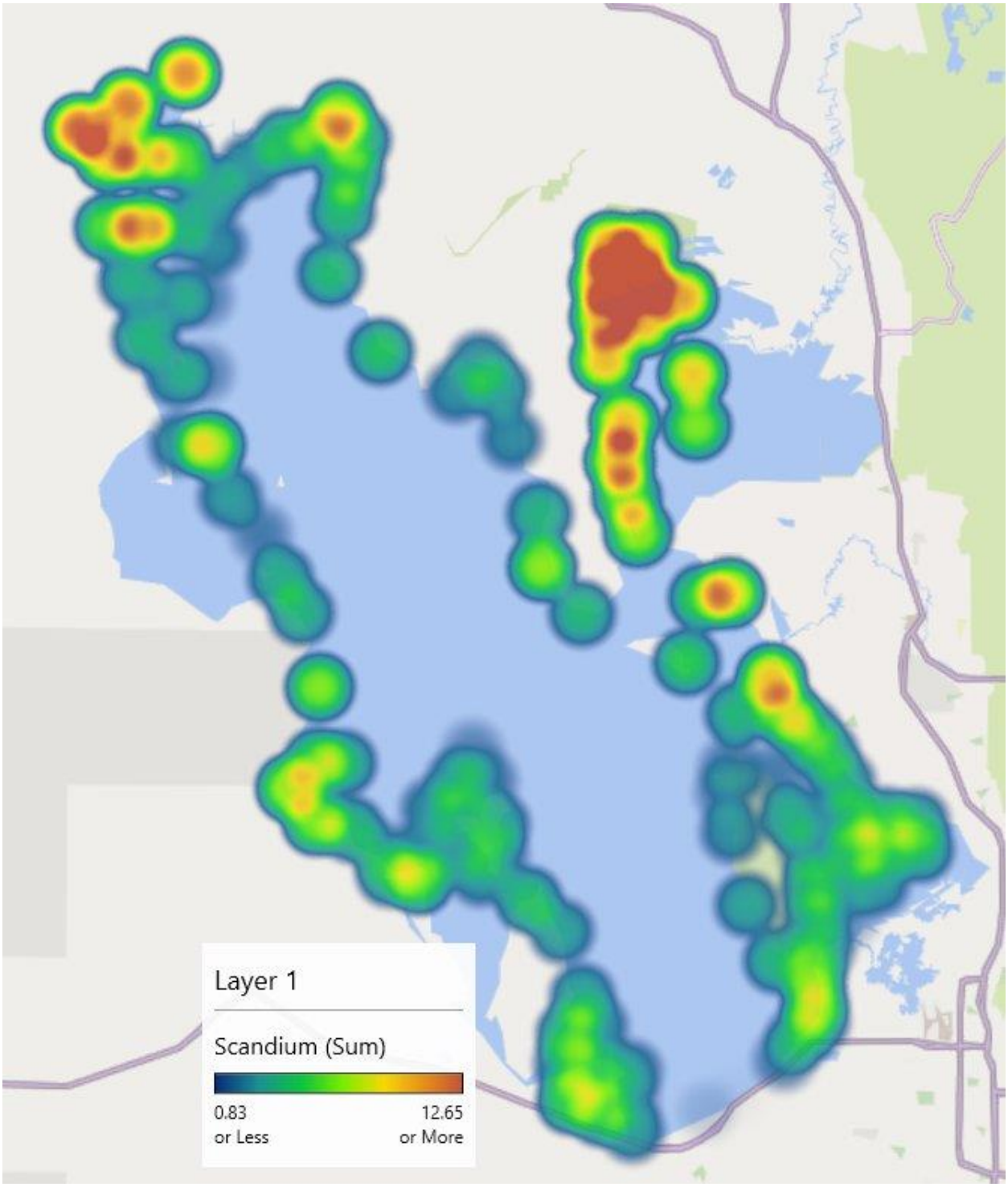

Figure H.37 Map showing the spatial distribution of scandium (mg/kg) in the PM_{10} fraction of the soil.

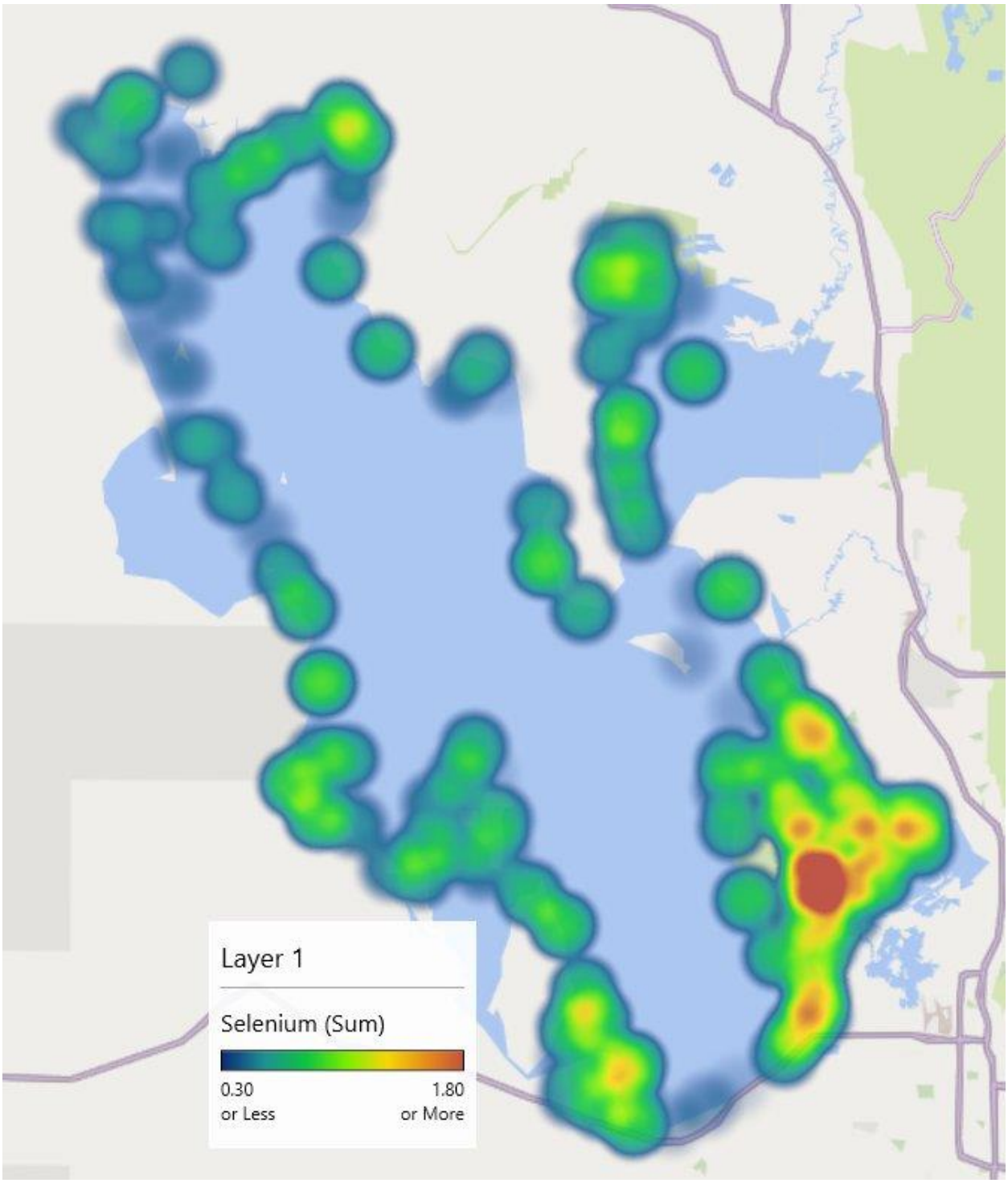

Figure H.38 Map showing the spatial distribution of selenium (mg/kg) in the PM_{10} fraction of the soil.

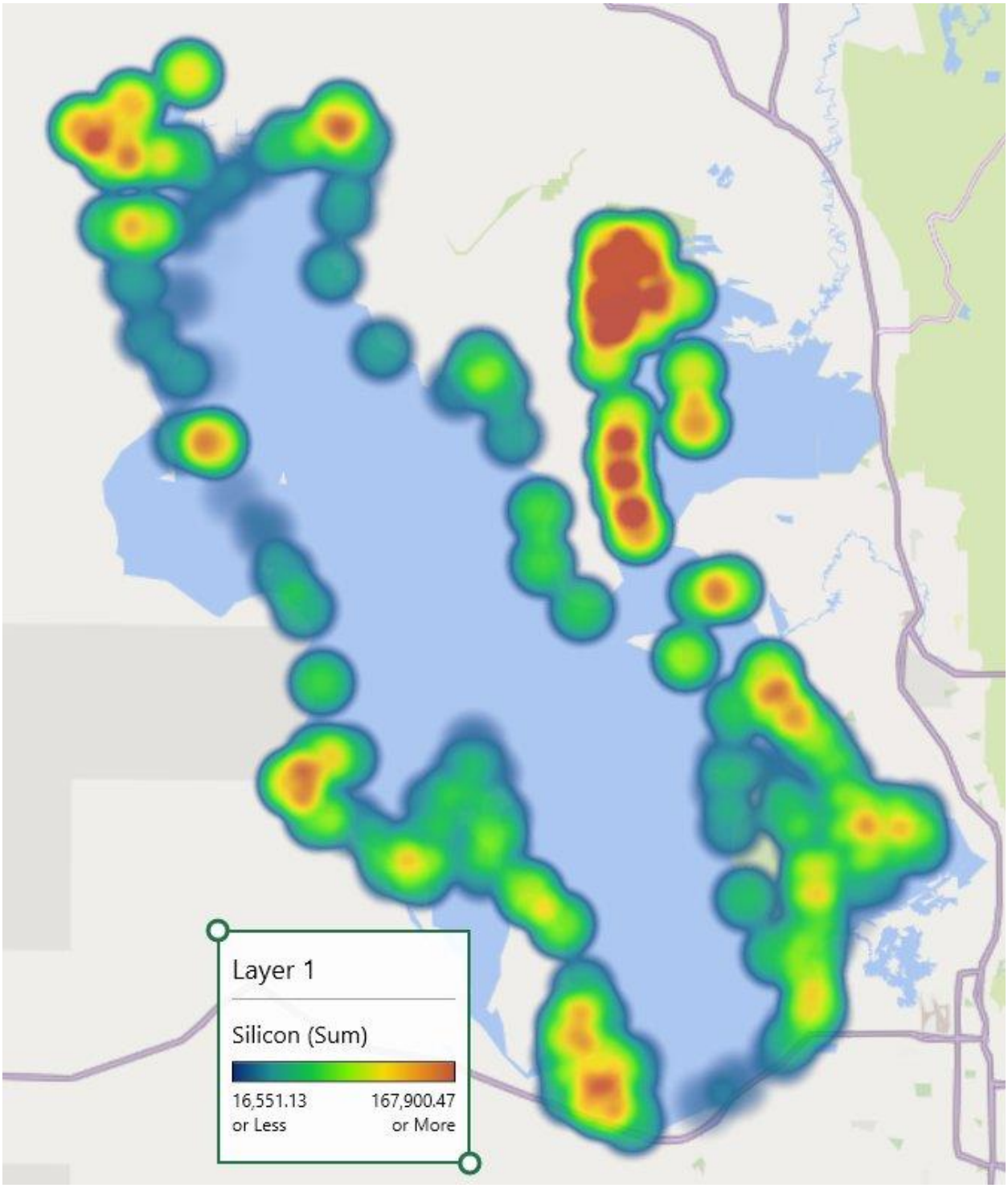

Figure H.39 Map showing the spatial distribution of silicon (mg/kg) in the PM_{10} fraction of the soil.

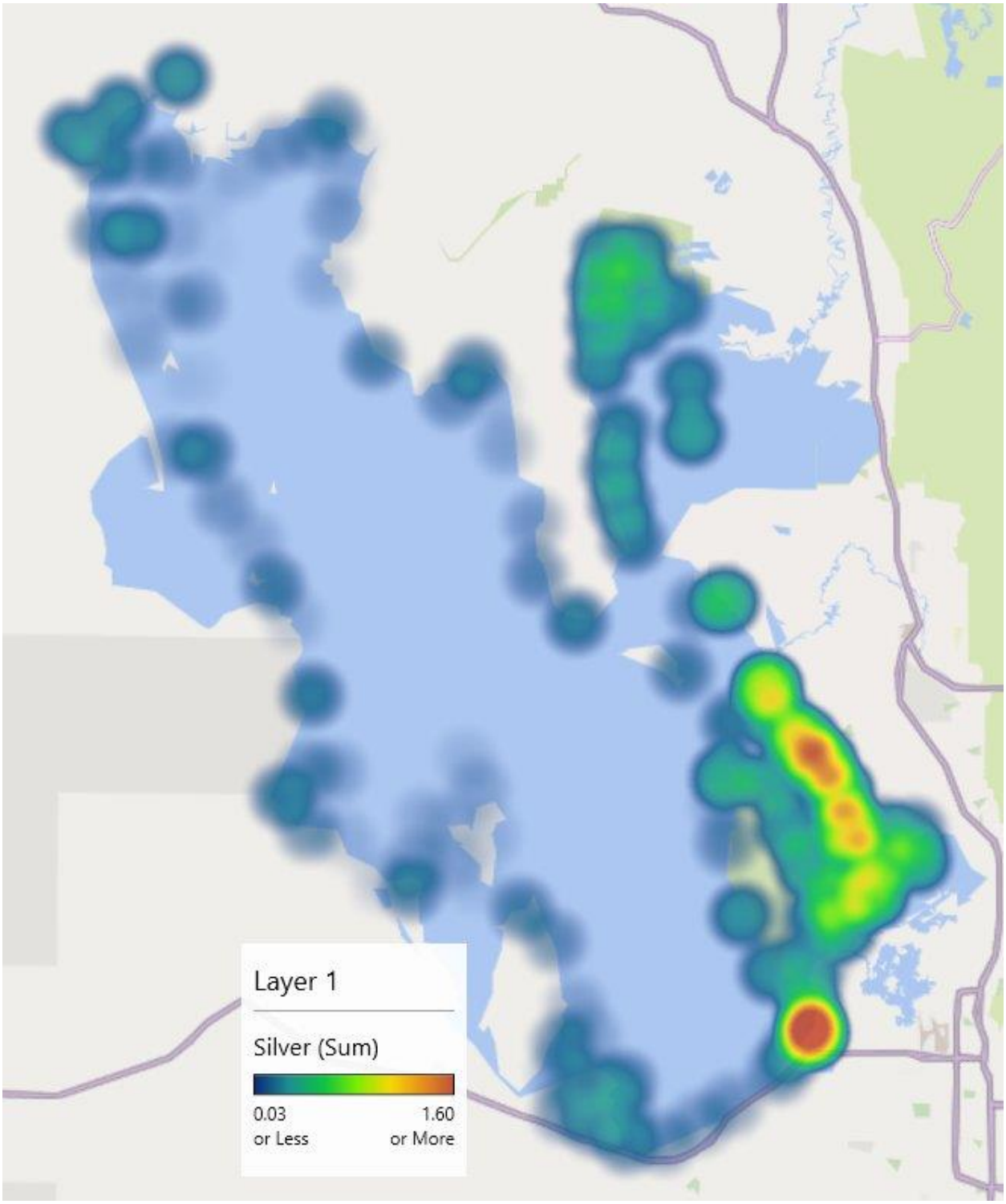

Figure H.40 Map showing the spatial distribution of silver (mg/kg) in the PM_{10} fraction of the soil.

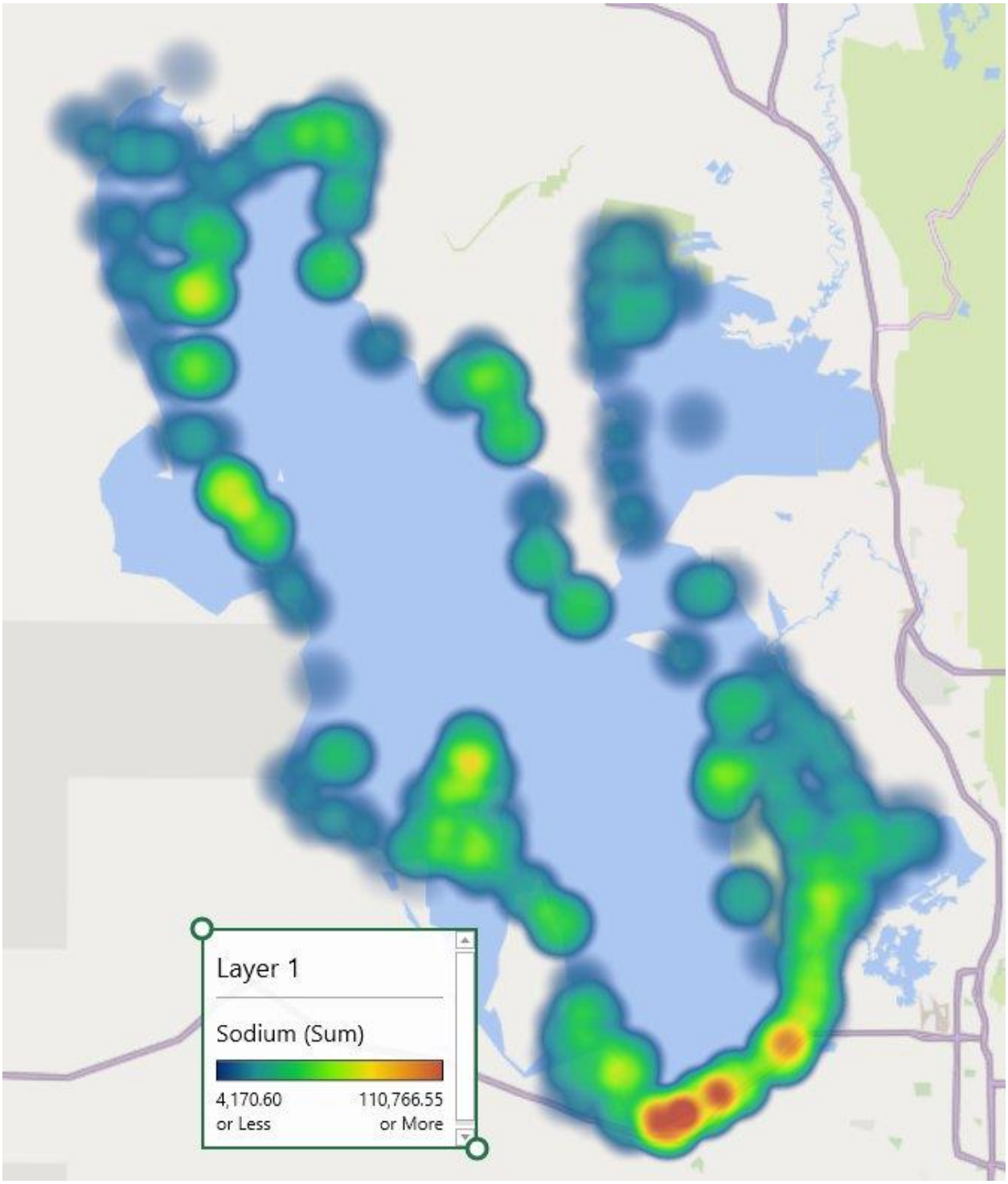

Figure H.41 Map showing the spatial distribution of sodium (mg/kg) in the PM_{10} fraction of the soil.

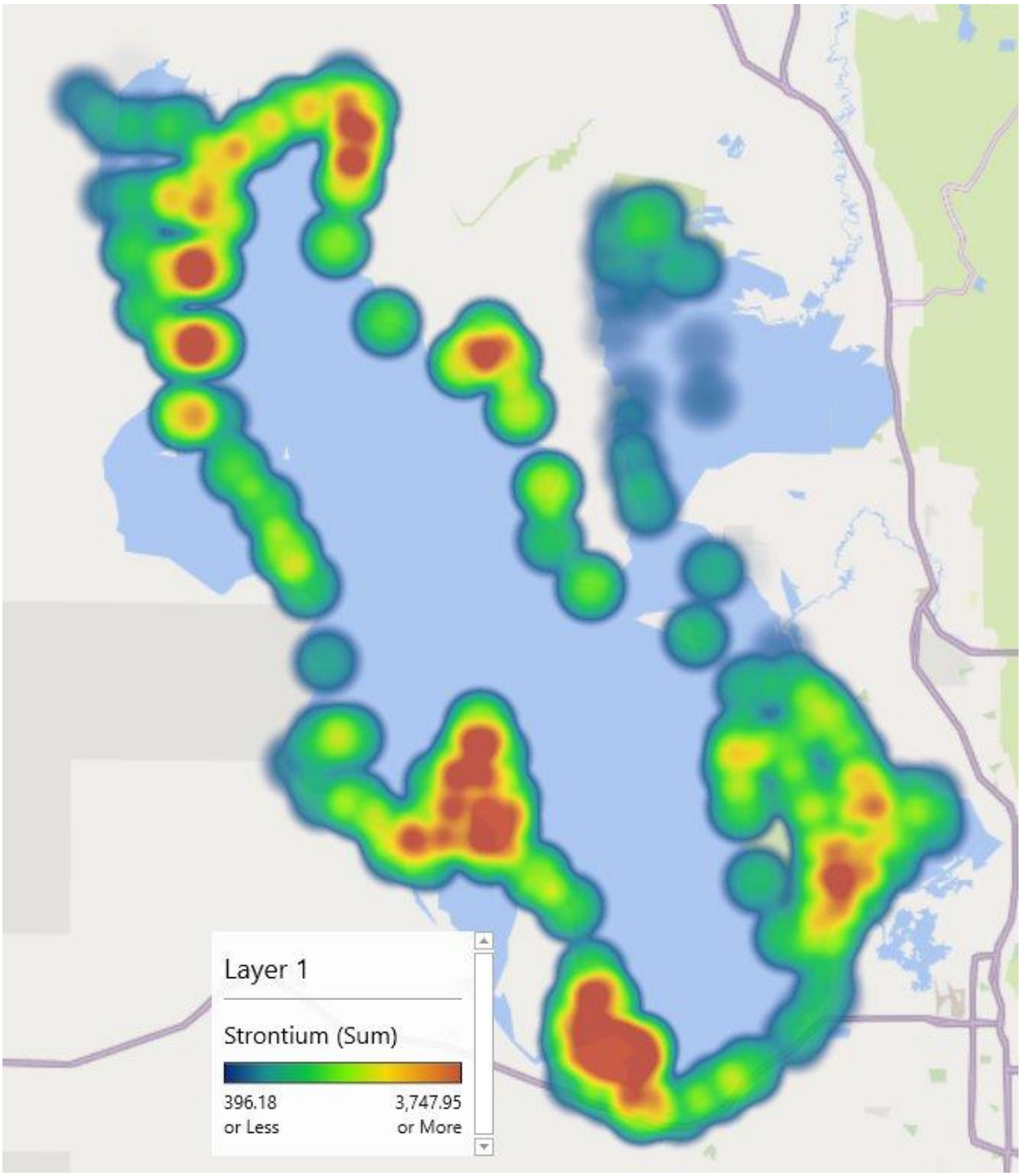

Figure H.42 Map showing the spatial distribution of strontium (mg/kg) in the PM_{10} fraction of the soil.

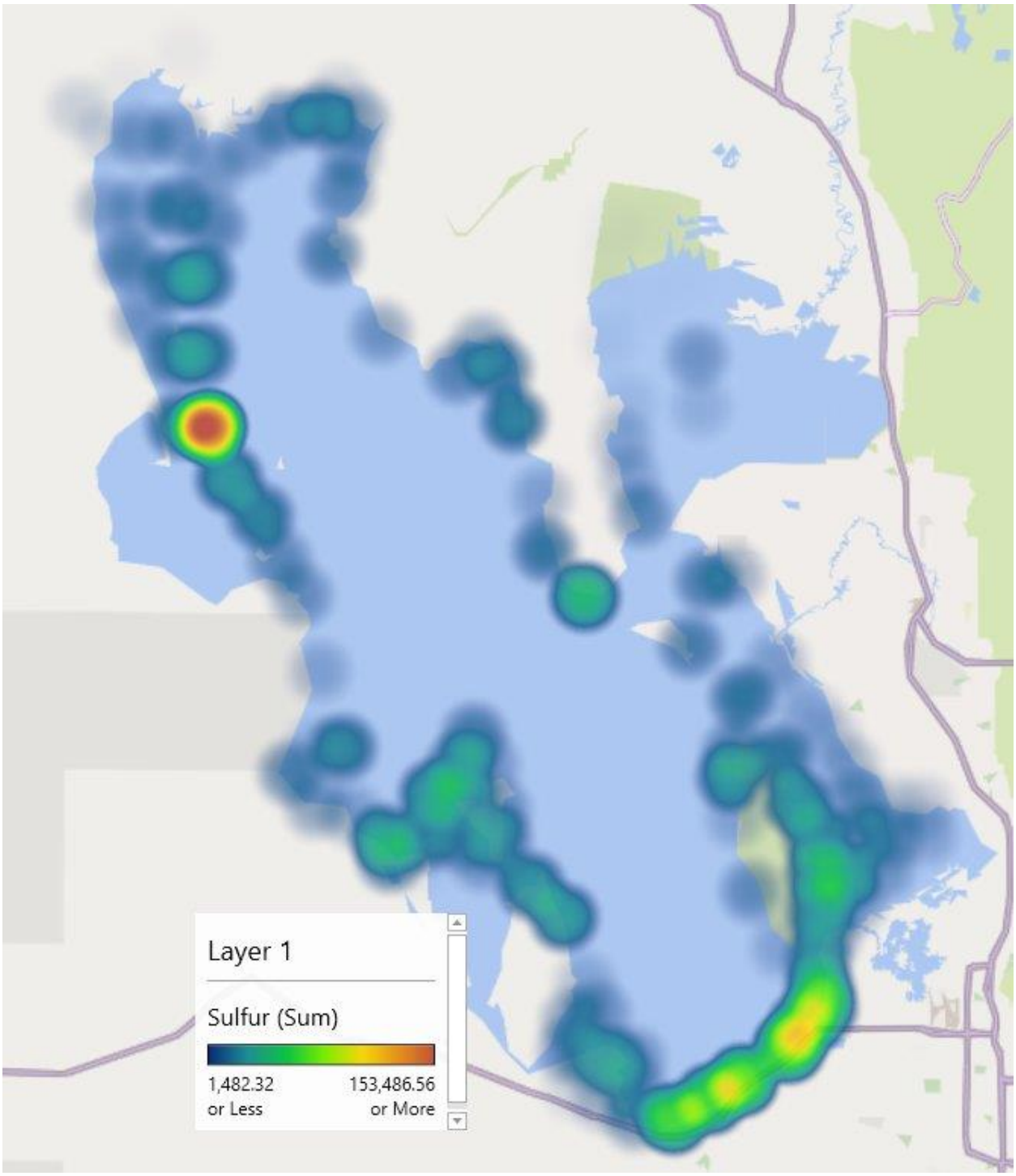

Figure H.43 Map showing the spatial distribution of sulfur (mg/kg) in the PM_{10} fraction of the soil.

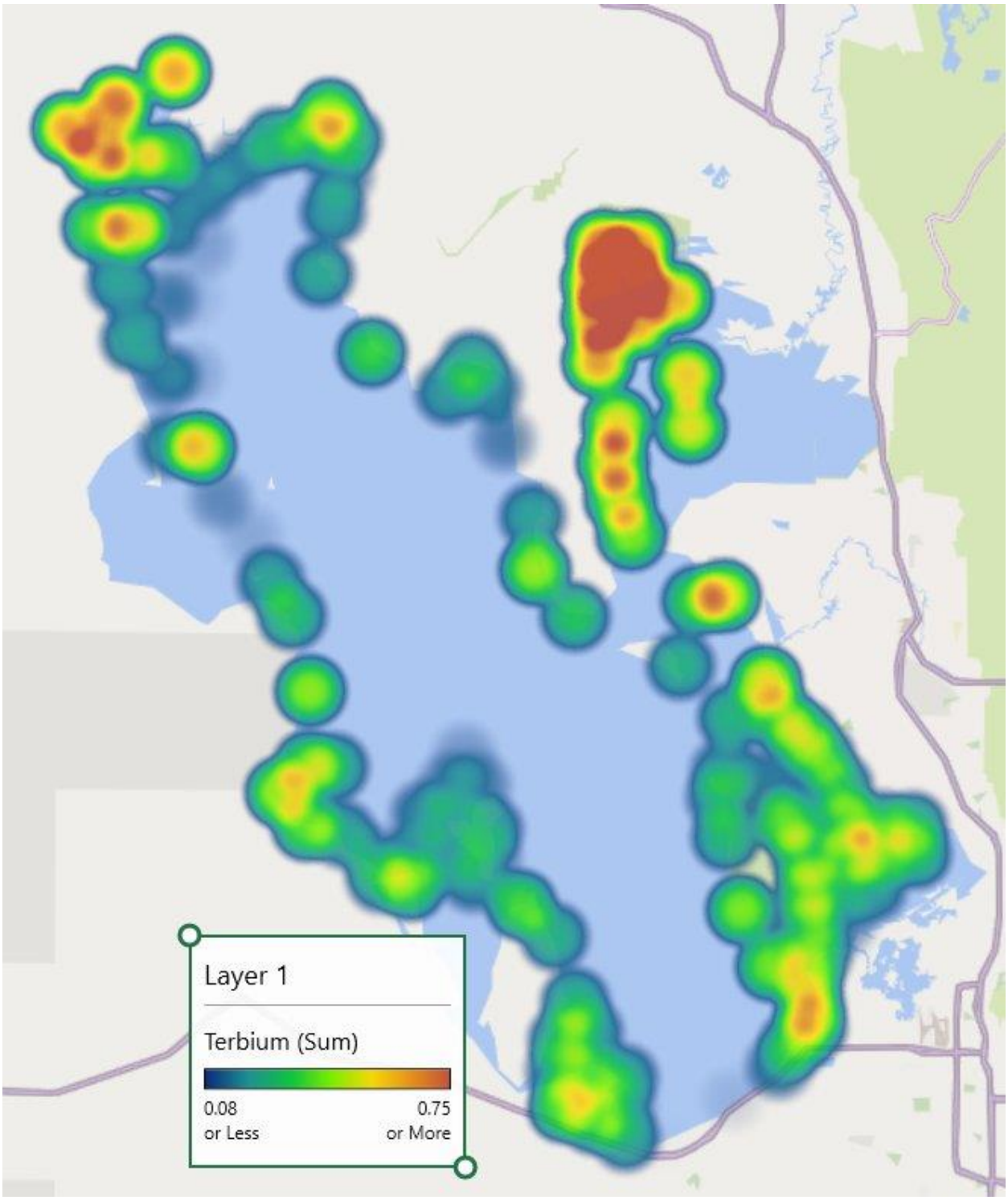

Figure H.44 Map showing the spatial distribution of terbium (mg/kg) in the PM_{10} fraction of the soil.

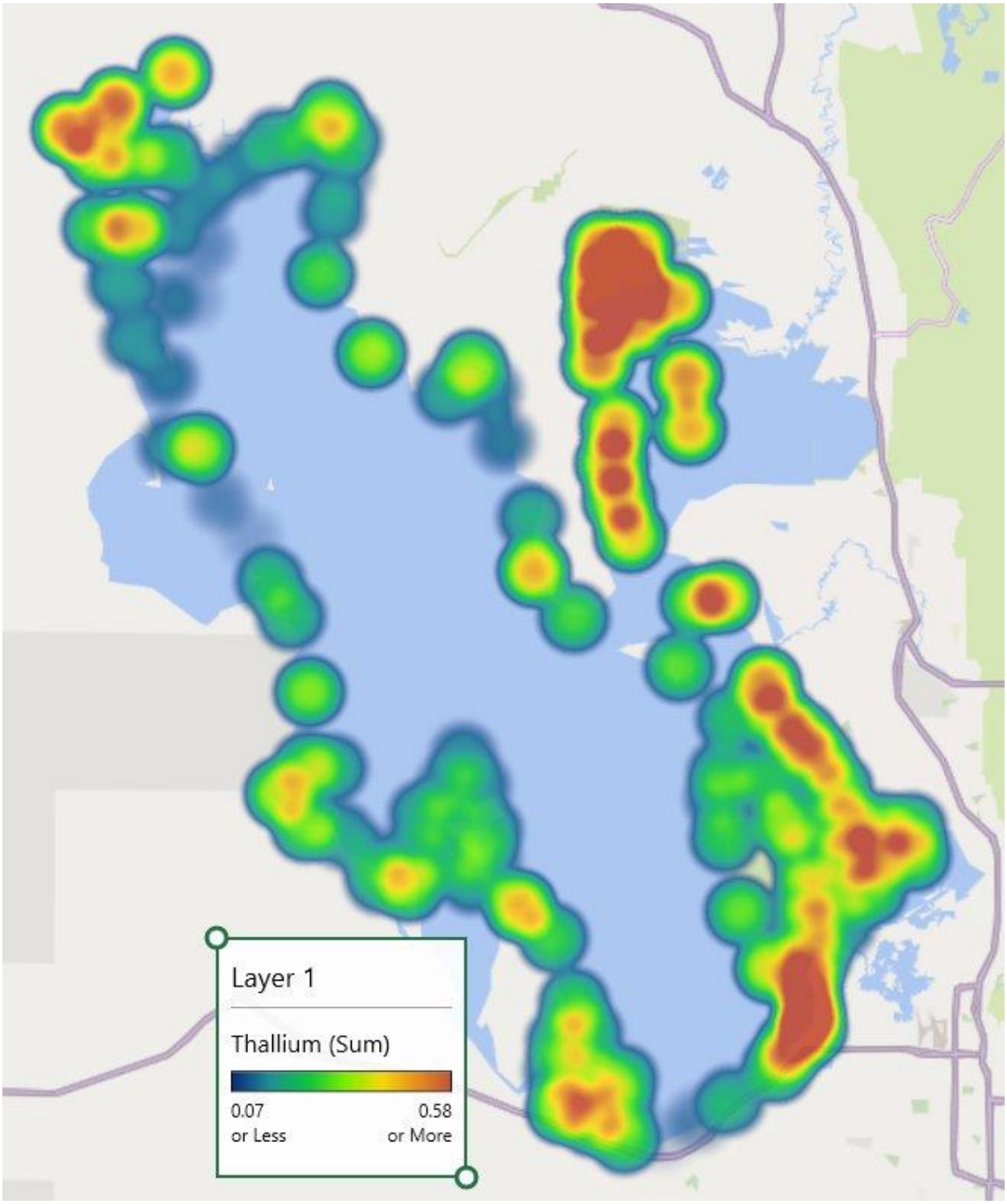

Figure H.45 Map showing the spatial distribution of thallium (mg/kg) in the PM_{10} fraction of the soil.

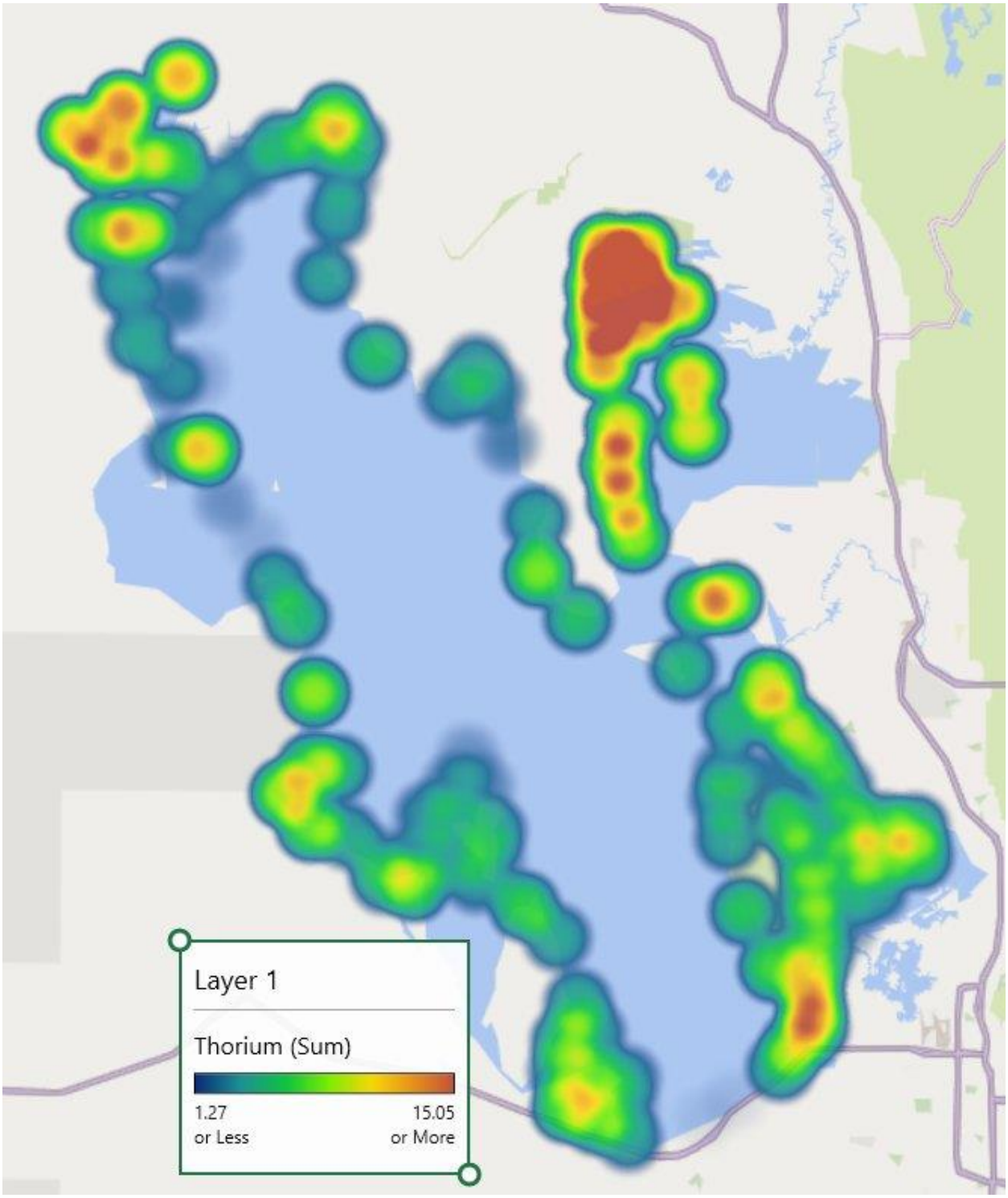

Figure H.46 Map showing the spatial distribution of thorium (mg/kg) in the PM_{10} fraction of the soil.

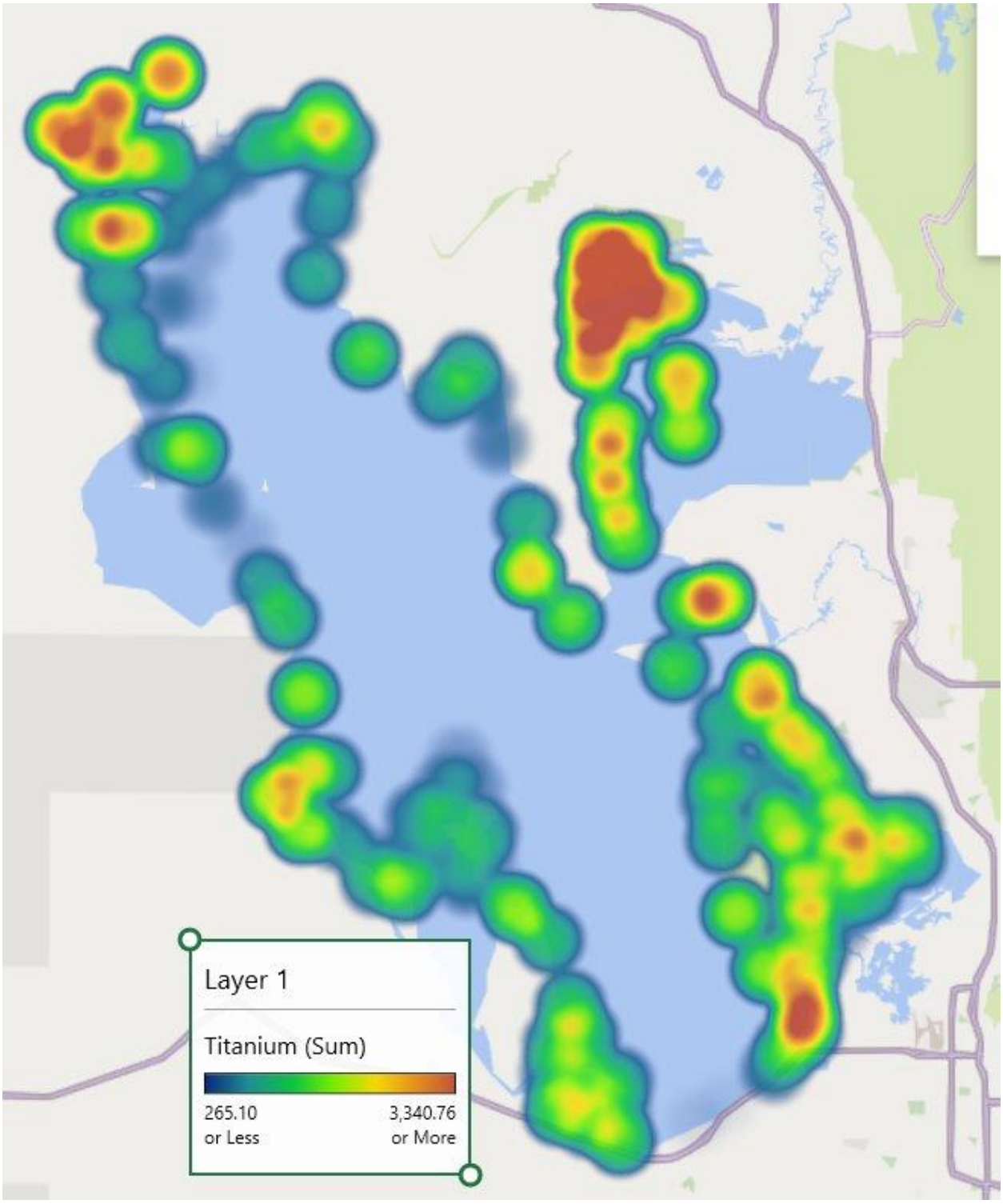

Figure H.47 Map showing the spatial distribution of titanium (mg/kg) in the PM_{10} fraction of the soil.

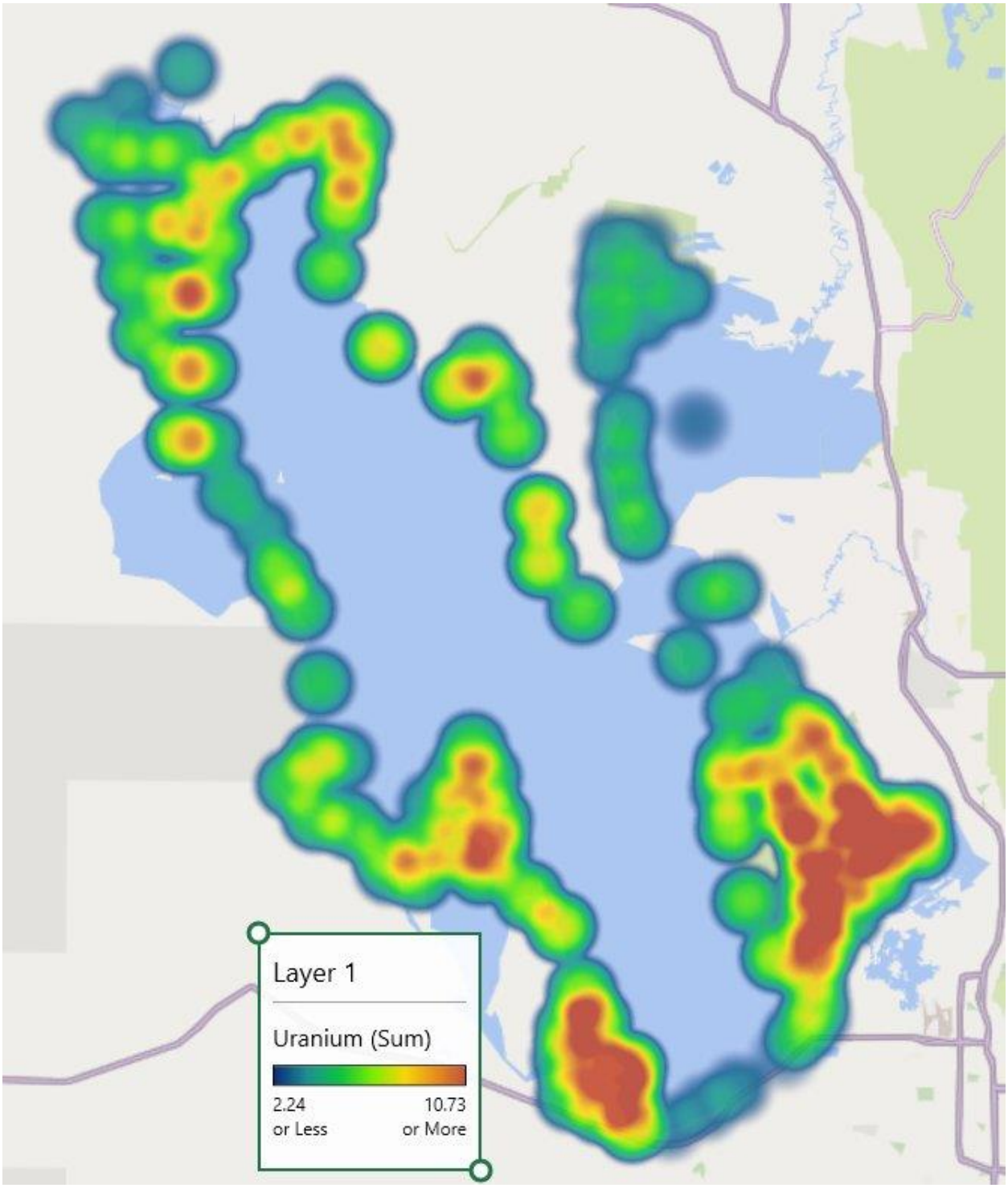

Figure H.48 Map showing the spatial distribution of uranium (mg/kg) in the PM_{10} fraction of the soil.

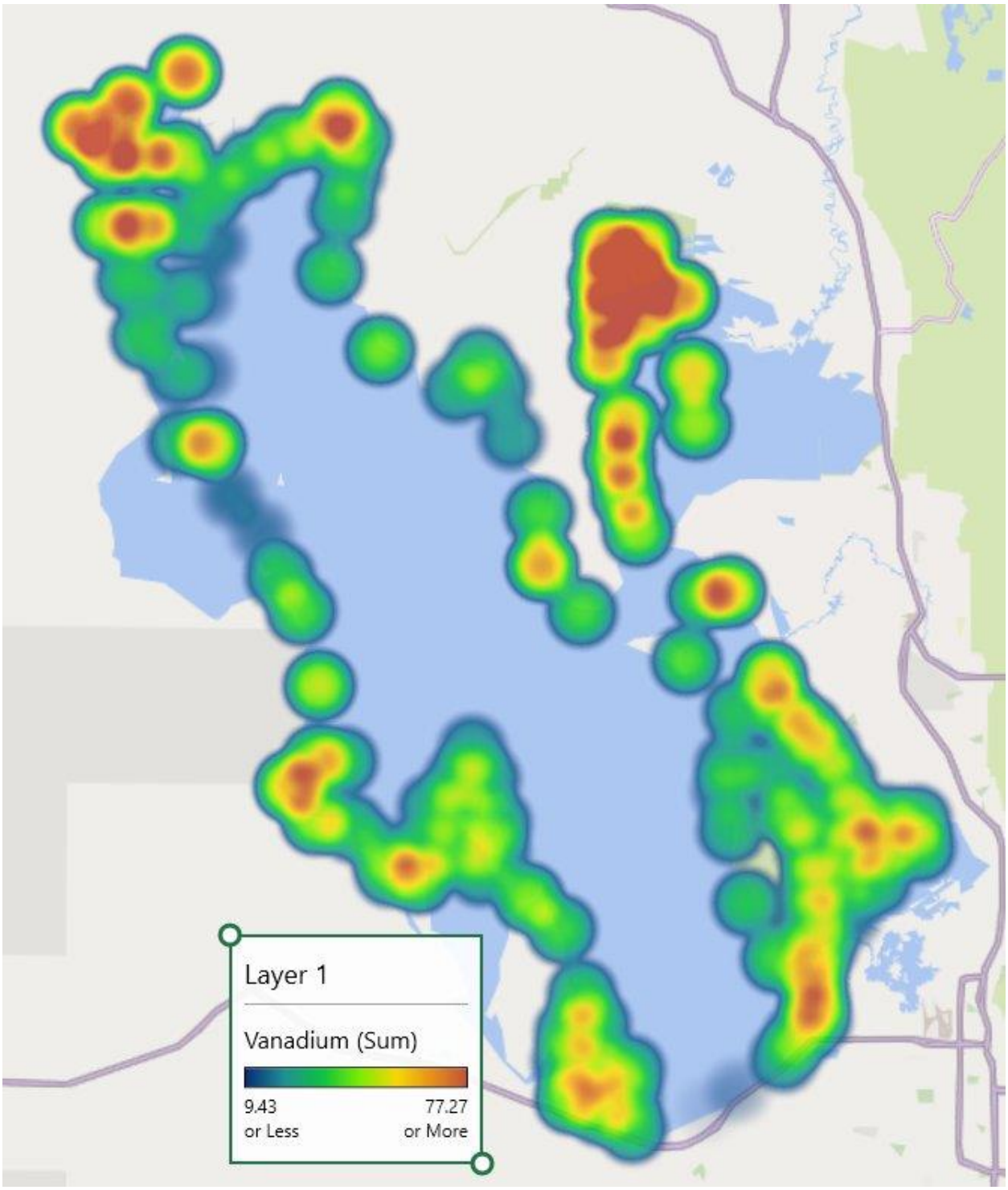

Figure H.49 Map showing the spatial distribution of vanadium (mg/kg) in the PM_{10} fraction of the soil.

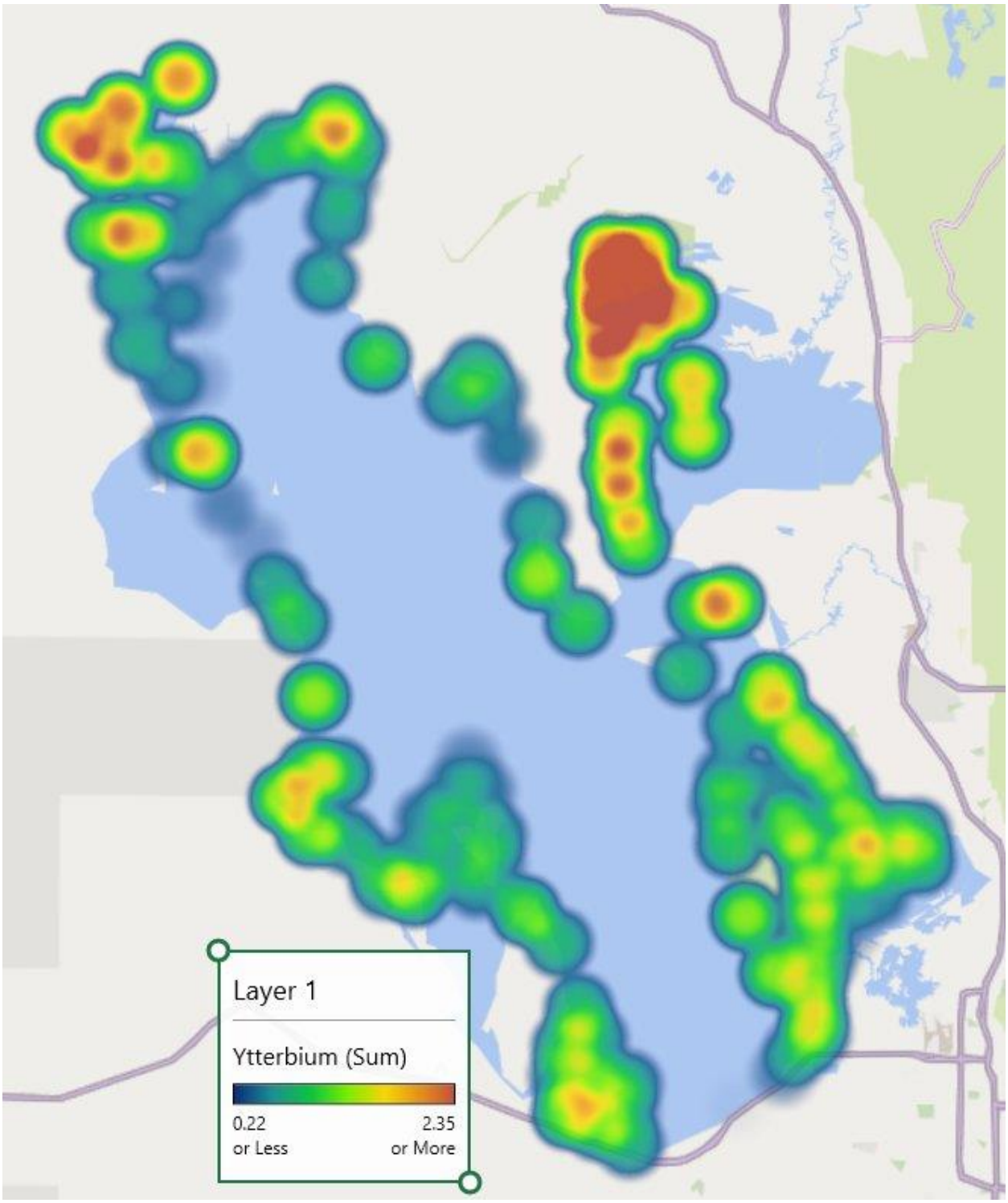

Figure H.50 Map showing the spatial distribution of ytterbium (mg/kg) in the PM_{10} fraction of the soil.

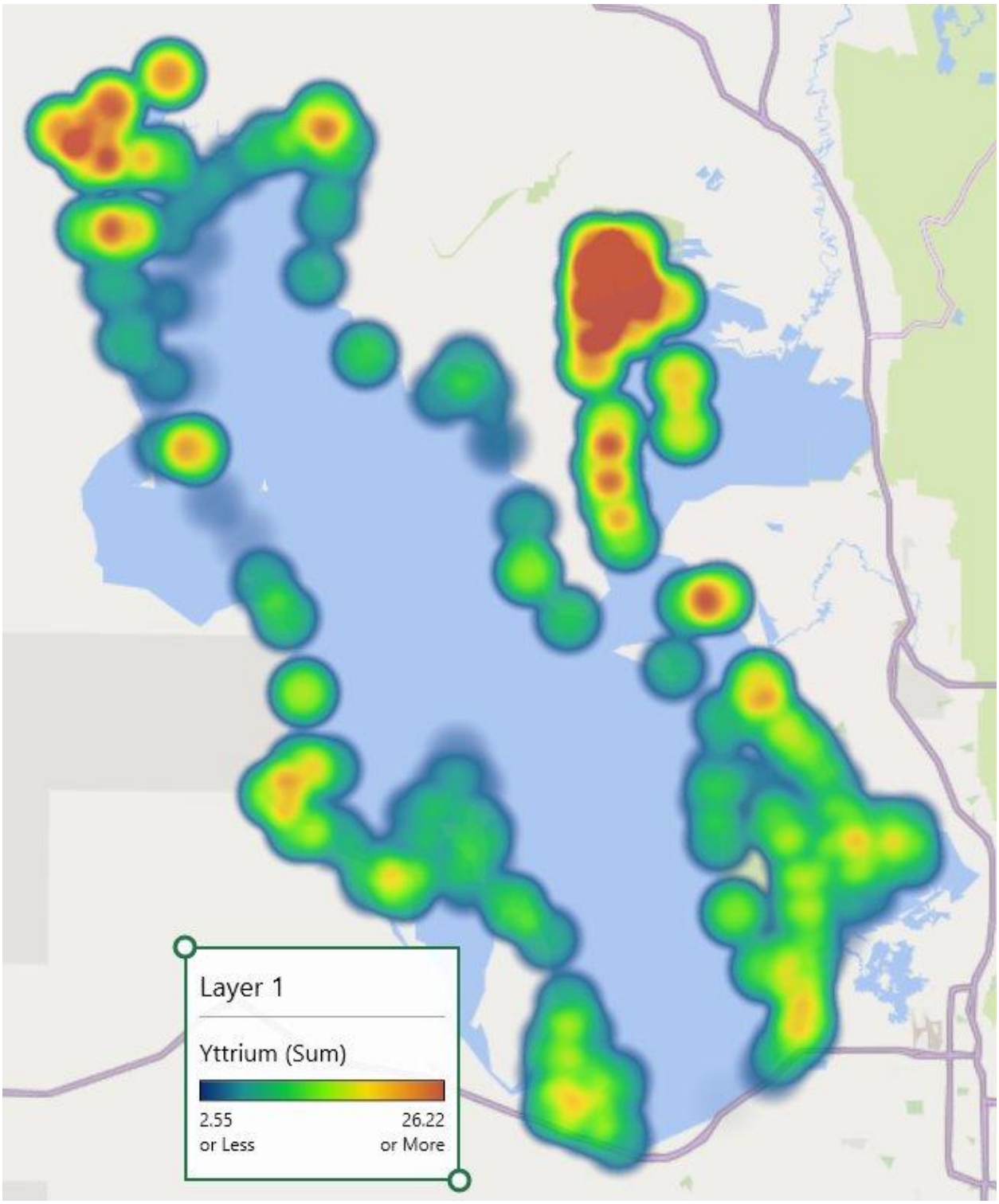

Figure H.51 Map showing the spatial distribution of yttrium (mg/kg) in the PM_{10} fraction of the soil.

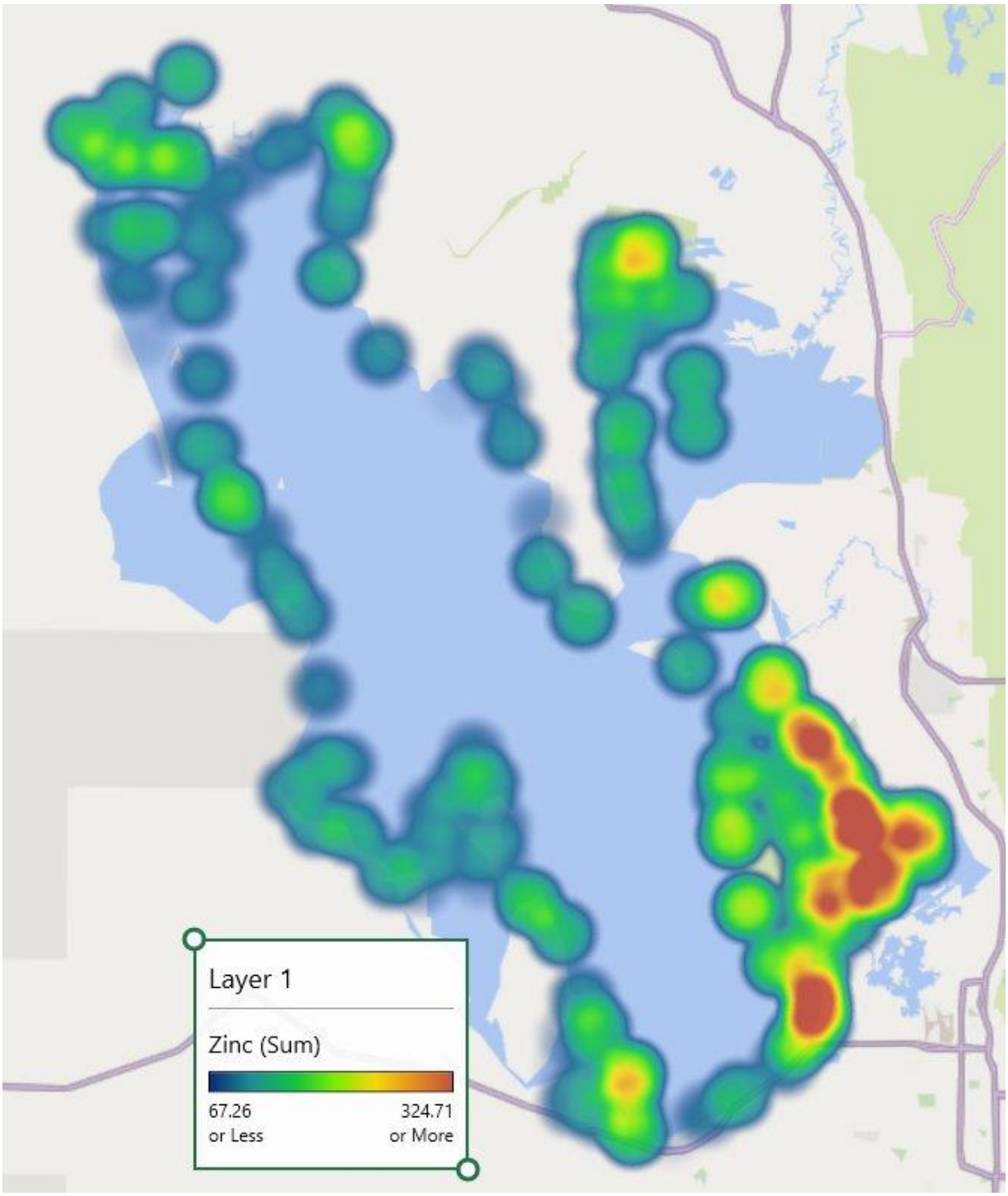

Figure H.52 Map showing the spatial distribution of zinc (mg/kg) in the PM_{10} fraction of the soil.

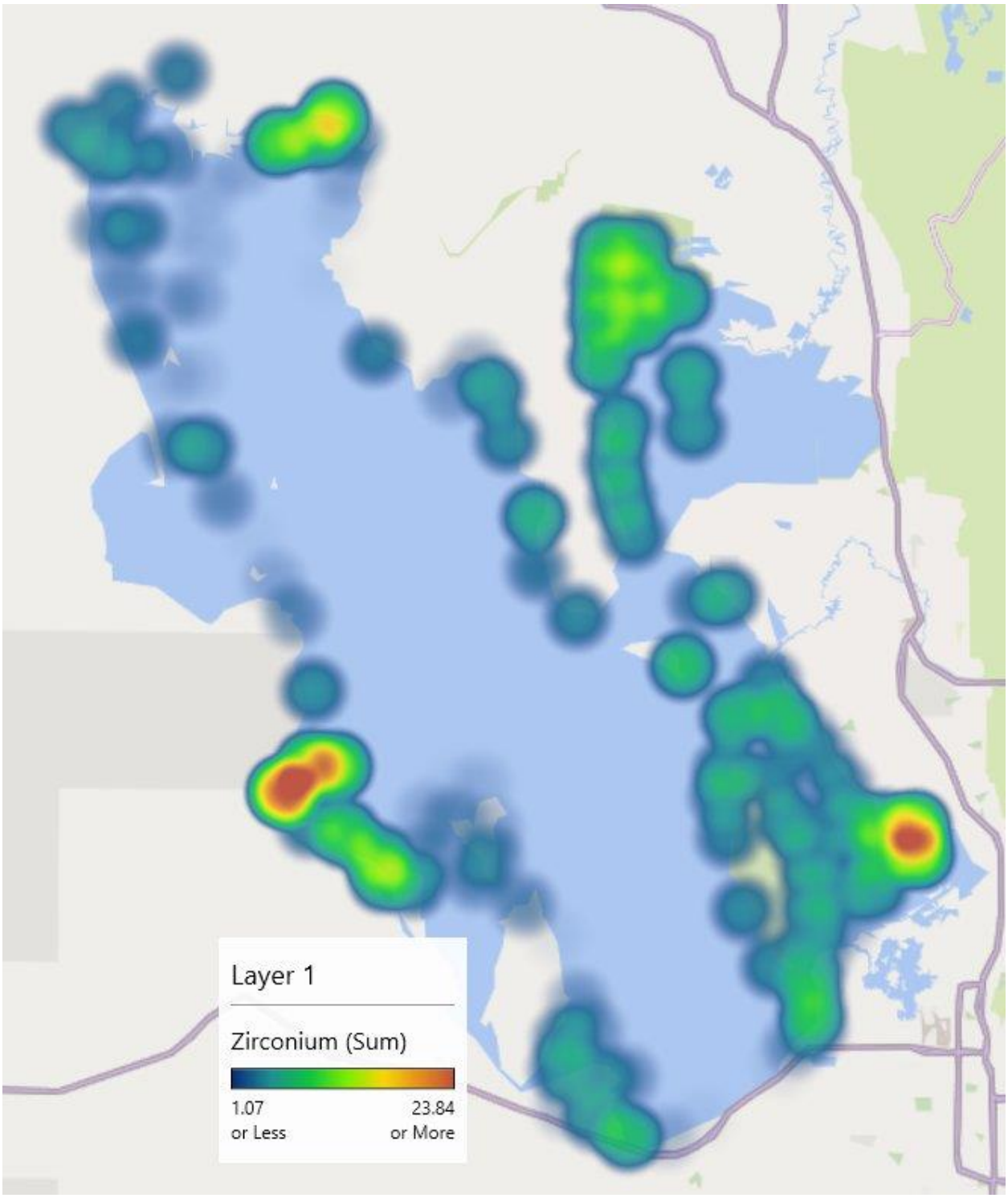

Figure H.53 Map showing the spatial distribution of zirconium (mg/kg) in the PM_{10} fraction of the soil.