2021 Monitoring Activities at the Utah Inland Port

Prepared by:

Utah Department of Environmental Quality
for the Utah Legislative Management Committee and Inland Port Authority Board

Introduction

Pursuant to Utah Code 19-1-201, the following report provides a summary of stormwater and air quality monitoring data collected by the Utah Department of Environmental Quality (DEQ) within the statutorily defined area of Utah Inland Port (UIP) Authority.

Data collected by DEQ through 2023 will be used to form the baseline conditions for the UIP. Information presented in this report is intended as an overview of the monitoring locations, methods used, and results of the initial year of monitoring. This first year of data should not be used to define or make inferences regarding the current baseline conditions until more data and information can be collected. Multiple years of quality data are needed to meaningfully assess any impact of the UIP on air and water quality.

Section 1: Stormwater Monitoring

Stormwater data collection only occurs during a qualifying precipitation event (at least 0.1" of rainfall and at least two weeks following the preceding storm event). Due to the extreme drought the state experienced throughout the summer, data collection has been limited. In addition, the initial placement of some storm water monitors was modified to improve collection efforts.

Monitors were initially placed on perennial channels — those that have a constant stream through at least some of its stream bed throughout the year— upstream and downstream of the UIP area to identify changes in water quality as water flowed through the sensors. The initial methodology assumed that changes in water quality could be attributed to the storm water inputs the channels received from the area between the upstream and downstream stations. However, this indirect method of evaluating storm water quality was later determined to be insufficient to meet the study's objective to characterize storm water quality, track changes over time, and evaluate the effectiveness of best management practices. A direct approach was therefore implemented by establishing new monitoring stations directly on storm drain channels that receive storm water contributions from the UIP.

Sampling was performed by the Division of Water Quality (DWQ) in accordance with the UIP Sampling and Analysis Plan (SAP) and DWQ Standard Operating Procedures. Samples were analyzed by the Utah Public Health Laboratory (UPHL). The objective of this study is to characterize stormwater quality associated with the UIP prior to (partially represented in this report), during, and following the development that will occur over the course of several years. A brief description of the monitoring sites and a summary table of the data is included. Please see the Utah Inland Port (UIP) Sampling and Analysis Plan (SAP) for details on study objectives, sampling methods, quality control, and data management.

Monitoring Locations

A total of six monitoring locations were installed with portable automatic samplers that are programmed to collect stormwater samples in response to qualifying precipitation events. Sites have been strategically located in areas that have recently begun development and where development is planned in the near future. Monitoring locations are shown in Figure 1 and details about the status and location of each monitoring site is summarized in Table 1.

Figure 1. UIP Stormwater Monitoring Sites

Table 1. UIP Monitoring Locations

Site ID	Site Name	Latitude	Longitude	Drainage Area (ac)	Status
4991297	Storm Drain Channel at 8000 W North Temple	40.77155	-112.08308	288	Currently active, sampler deployed June 2021. Area in pre-development conditions as of November 2021.
4991299	Storm Drain Channel at 7200 W and 1300 N	40.79863	-112.06399	1,222	Currently active, sampler deployed April, 2021. Area in pre-development condition as of November 2021.
4991302	Storm Drain Channel at 6500 W 1100 N	40.79447	-112.04880	300	Currently active, sampler deployed April 2021. Area under development as of November 2021.
4991303	Storm Drain Channel at 6000 W 600 N	40.78396	-112.04408	655	Currently active, sampler deployed April 2021. Area under development as of November 2021.
4991305	Storm Drain Channel at end of John Cannon Dr	40.78732	-112.01642	109	Currently active, sampler deployed June 2021. Area under development as of November 2021.

4991313	Storm Drain Channel at 150 S 5600 W	40.76567	-112.02543	180	Currently active, sampler deployed June 2021. Area under development as of November 2021.

Stormwater Data

Stormwater monitoring data representing initial sample collection for the pre-development or early development baseline of UIP is summarized in the table below. DWQ is awaiting results of three additional storm sampling events that occurred in October 2021. Further, an additional two sampling events are needed to establish the baseline at new sites that were established in summer 2021. These sites were established to better characterize the range of conditions occurring at the UIP site.

Once DWQ has a full suite of baseline data, it will be further summarized and compared to future development states (active construction and post construction) at the UIP site.

Table 2. Summary of Data from UIP Stormwater Monitoring: April 2021-August 2021

	As*	Cd*	Cu*	Hg*	Pb*	Se*	Zn*	Ammonia as Nitrogen**	Nitrate + Nitrite as Nitrogen**	Total Nitrogen**	Total Phosphate**	Total Dissolved Solids**	Total Suspended Solids**	Total Volatile Solids**
4991299														
Count	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Maximum	46.3	0.219	18.2	0.1	9.59	0.635	26.9	0.187	2.08	3.01	0.307	1810	280	34
Minimum	28.2	0.05	2.29	0.1	0.714	0.5	5	0.035	0.144	0.816	0.077	1080	11	3.2
Average	34.3	0.122	9.44	0.1	3.935	0.545	12.3	0.114	0.799	1.559	0.184	1447	106	14.3
Standard Deviation	10.4	0.087	8.08	0	4.913	0.078	12.6	0.076	1.109	1.257	0.116	365	151	17.1
4991302														
Count	6	6	6	6	6	6	6	6	6	6	6	6	6	6
Maximum	28.5	0.779	54.4	0.1	35.3	0.734	122	0.372	1.2	2.1	1.04	2170	990	80
Minimum	8.07	0.102	13.9	0.1	7.37	0.5	27.8	0.147	0.152	0.541	0.181	236	73	8
Average	16.10	0.368	30.4	0.1	19.25	0.570	68.9	0.239	0.542	1.160	0.527	718	362	30
Standard Deviation	8.17	0.282	17.4	0.0	13.20	0.110	41.6	0.082	0.411	0.654	0.356	720	369	27

4991303														
Count	7	7	7	7	7	7	7	7	7	7	7	7	7	7
Maximum	38.9	0.204	31.9	0.1	10.3	0.789	43.1	0.414	1.68	2.87	0.381	2960	395	35
Minimum	15	0.05	11.2	0.1	2.36	0.5	9.27	0.064	0.349	1.52	0.138	366	32	5.2
Average	25.6	0.111	17.2	0.1	4.81	0.551	21.07	0.185	0.853	2.01	0.223	1549	139	15.1
Standard Deviation	9.1	0.056	7.2	0.0	3.31	0.108	13.06	0.117	0.529	0.54	0.098	993	135	10.6
4991305														
Count	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Maximum	15.7	0.368	73.7	0.1	34.5	0.793	121	0.137	0.523	1.96	0.465	502	247	40
Minimum	14.6	0.287	17.6	0.1	9.2	0.763	74.8	0.017	0.152	1.76	0.418	236	235	26
Average	15.2	0.328	45.7	0.1	21.9	0.778	97.9	0.077	0.338	1.86	0.442	369	241	33
Standard Deviation	0.8	0.057	39.7	0.0	17.9	0.021	32.7	0.085	0.262	0.14	0.033	188	8	10

* Result values reported in ug/L as total metals

** Result values reported in mg/L

Results below reporting limits are reported at the detection limit. These data will be compared to active construction and post-development circumstances in the coming years.

A spreadsheet of these data is also available for download.

Additional data, not presented here, has been collected and analyzed for quality assurance purposes and screening for petroleum related pollutants. Field duplicates were collected at sites 4991302 and 4991303 on April 26, 2021 and May 23, 2021. Samples collected in May showed an acceptable difference between duplicates, while the April samples had some large variations that are currently being examined. An Equipment Blank was analyzed from the sampling event on April 15, 2021 and showed no cross-contamination by the sampling procedure or sampling equipment between sites.

Samples were analyzed for a suite of total petroleum hydrocarbon pollutants including gasoline, diesel and oil range organics from four sites (4991299, 4991302, and 4991303, and Goggin Drain – 4991340) on April 15, 16, 26 and May 23.

UIP Baseline Water Quality Data Limitations

As stated previously, due to the extreme drought the state experienced throughout the summer, data collection has been limited. Additional data collection over time (at least through 2023) is necessary in order to establish a more meaningful baseline of storm water conditions present at the UIP.

Section 2: Air Quality Monitoring

The Division of Air Quality (DAQ) established monitoring facilities at the UIP site to track pre-development or early development baseline. This monitoring includes: a sensor system consisting of monitors to measure levels of research-grade particulate matter, ozone, and oxides of nitrogen, and data logging equipment with internal data storage that are interconnected at all times to capture air quality readings and store data.

Monitoring Locations

UIP air quality monitoring sites are known as the Lake Park (LP) site and the Prison site (currently named IP, but this will be changed in the future). LP site monitors for continuous and filtered PM2.5, PM10, sulfur dioxide, ozone, and nitrogen dioxide. East of the UIP and Salt Lake International Airport is the Air Monitoring Center (AMC) site that monitors for all parameters. Supporting these measurements are weather measurements for temperature, wind speed and wind direction. The IP site monitors continuous PM2.5, ozone, and nitrogen dioxide with supporting weather measurements for wind speed, direction, temperature, and ambient pressure.

All instruments/data, with the exception of PM2.5 filter measurements, are connected to the air monitoring network and report data in near real time, hourly, to the network data collection system. This data is then posted to DAQ web pages, the UtahAir mobile application, and EPA's AirNow site on an hourly basis. All data is reported to federal databases at least quarterly as required by EPA.

Table 3. UIP Air Monitoring Locations and Parameters

County	EPA AIRS Code	Station Name (Code)	Station Address	Latitude	Longitude	Elevation (Meters)	Monitored Parameters
Salt Lake	490353011	Air Monitoring Center	240 N 1950 West, Salt	40.7769	-111.9461	1286	PM2.5, PM10, O3, NOx, SO2, CO, NH3,

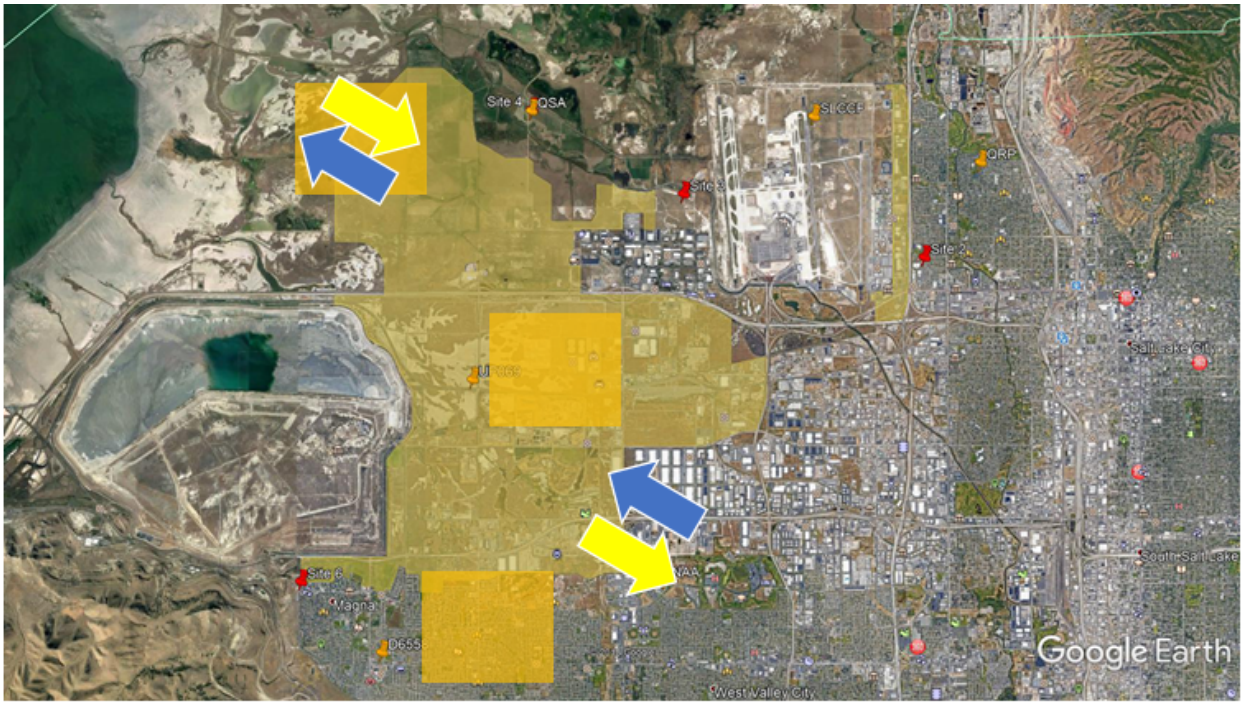
		(UT)	Lake City				Meteorology
Salt Lake	**490351007**	**Inland Port (IP)**	**1480 N 8000 W, Salt Lake City**	**40.8079**	**-112.0877**	**1285**	**PM2.5, BC, O3, NOx, Meteorology**
Salt Lake	**490353005**	**Lake Park (LP)**	**2782 S. Corporate Park Dr., West Valley City**	**40.7098**	**-112.0086**	**1295**	**PM2.5, PM10, BC, O3, NOx,CO, Meteorology**

Monitors that were partially funded through a legislative appropriation are noted in bold.

A summary of the monitors found at all sites, including UIP sites, can be found on page 8 of the "Division of Air Quality Annual Monitoring Network Report 2021." Site specific information related to instrument type and other related information can be found on pages 25 and 28.

Air Monitoring Data Collection and Certification

Air monitoring data is collected annually and is certified at the end of the year once comprehensive quality control checks have been completed. The data is then certified with EPA, and can be used for regulatory purposes to demonstrate compliance with federal air quality standards. The due date for data certification is May 1 of each year. Requirements for data certification can be found in 40 CFR part 58. All data certification is reviewed by EPA and they either concur, or not, to the states' assertion of data completeness. Analyzing site data before the end of the year or on a daily, monthly, or quarterly basis when collecting baseline data is of limited value as all standards and parameters are based on the data of an entire year, Jan 1 - Dec 31. Data completeness and efficiency is also based on the data collected for the entire year.



Winter Winds
Yellow arrows: Daytime
Blue arrows: Nighttime
Yellow overlay: Inland Port region
Orange overlay: Possible monitor location

Inland Port Analysis

Monitoring began at the LP site in September 2020 and at the IP site in March of 2021. To date the IP and LP sites have reported 98.3% of data during the period of operation. Most parameters report an hourly value and it is these sampling opportunities that are used to determine data reporting. Some data values will be eliminated due to quality control checks, instrument malfunction, routine maintenance, power outages etc. The final numbers for the year will not be determined until the data certification process, which will be conducted in February and March of 2022.

UIP Baseline Air Quality Data Limitations

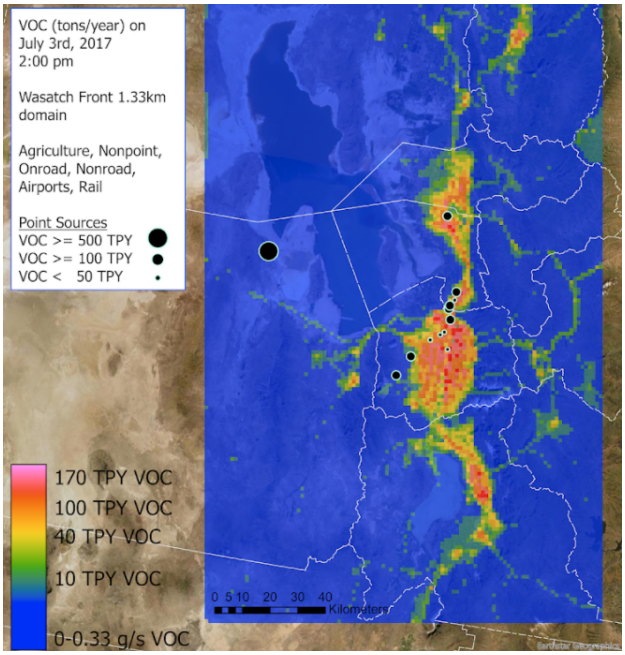
The two current UIP air monitoring locations, LP and IP, have been in operation for less than three years. This limits the conclusions that can be drawn from the available measurements. Additionally, the information collected during operations are dominated by non-normal monitoring years. 2020 was impacted greatly by the global pandemic, causing changes in the emissions in the monitoring locations, and the summer of 2021 was greatly impacted by wildfire smoke.

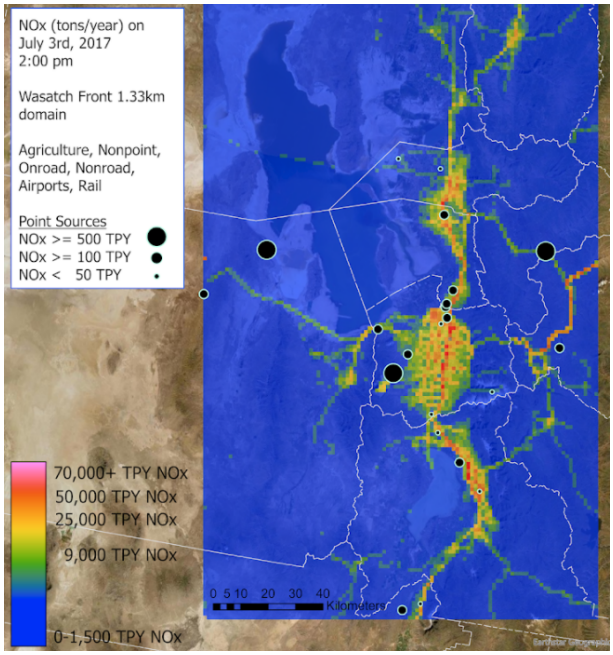
Conclusions about the current measurement will be informed by more data collected in the future. In addition, the IP site is located at the new prison site, which is under construction. Frequent power outages impact data collection and the construction environment should be considered to be normal baseline activity. No conclusions should be drawn from these numbers as they are based on short time periods and years with great impacts from uncontrollable events.

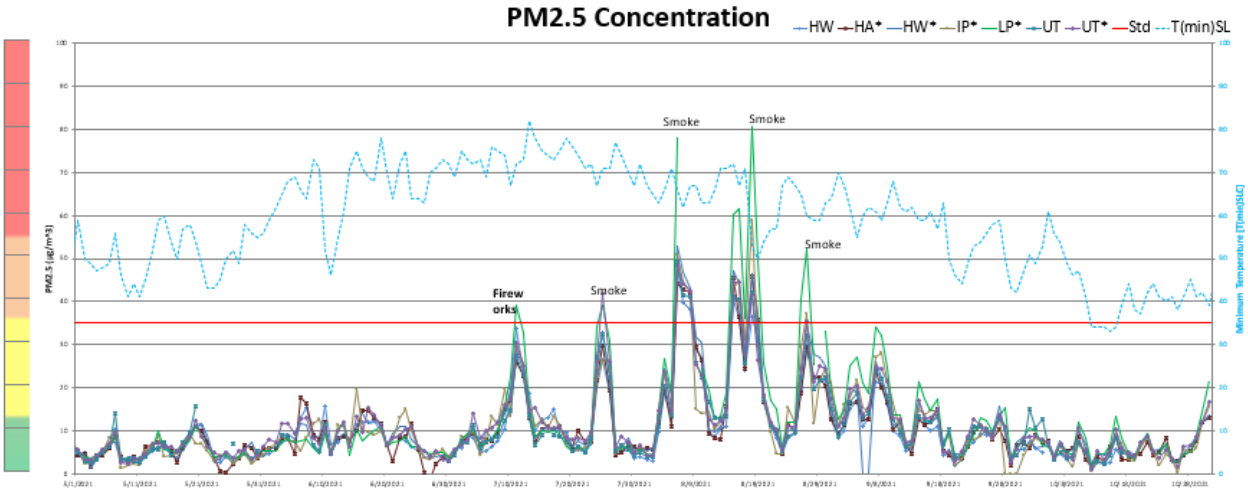
Please note that 2021 measurements are not fully quality certified, and the Design Value calculation cannot be made on partial years of data.

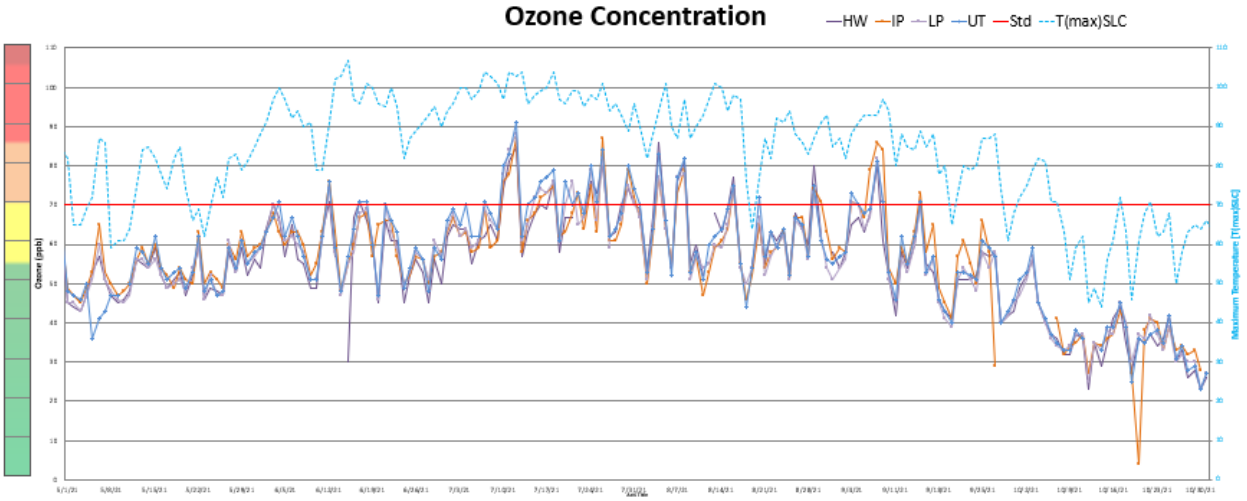
Monitored air quality for the spring and summer of 2021 at the newly established UIP monitoring sites correlates very well with the air quality monitors within the Salt Lake region, indicating that regional air quality is impacted by the combination of all emissions sources.

Emissions sources within the geographical IP area are predominantly from transportation, manufacturing and warehousing. The baseline daily emissions are represented by the 2017 triennial statewide air emissions inventory. Summer Day Volatile Organic Compound and Oxides of Nitrogen Emissions are distributed throughout the Wasatch Front.



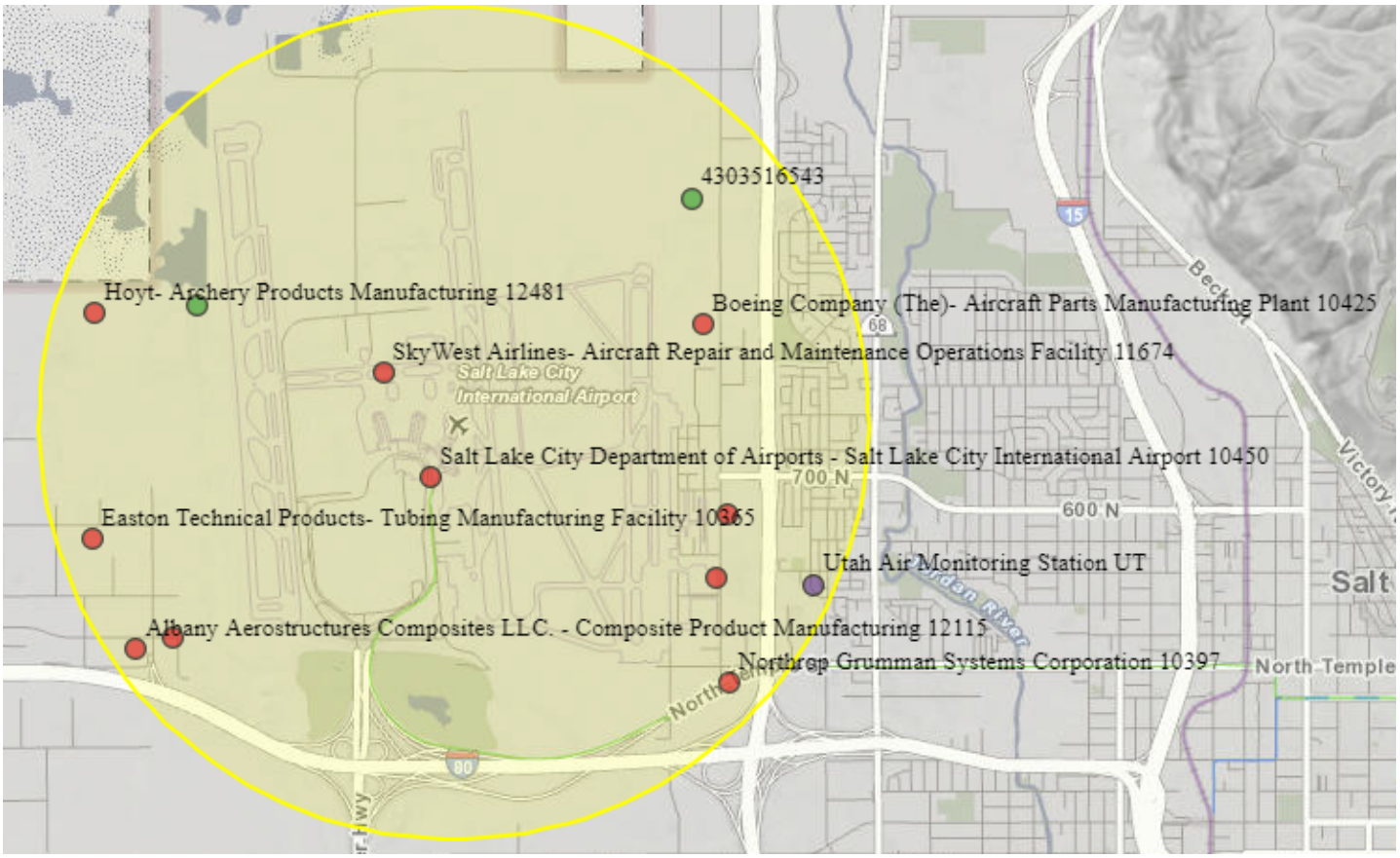






Salt Lake International Airport (SLIA) Air Quality Data

Air quality monitoring data is not being collected within the SLIA. The SLIA is bracketed by the Department of Environmental Quality Technical Support Center AMC monitor to the east, the IP site to the west, the LP site to the southwest and the Bountiful Viewmont site to the northeast.



Air quality compliance inspections are routinely performed at the permitted sources that are within or supporting the SLIA to determine compliance with air emissions and control requirements. Emissions trends will be tracked through the air emissions inventory process along with projections for emissions increases through the development of State Implementation Plans that will occur during future reporting periods.