

**Tribal AQS Data Gap Study**Prepared for the Institute for Tribal Environmental Professionals  
and  
Western Regional Air Partnership - Tribal Data Work Group  
by  
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1.0 Introduction

The U.S. Environmental Protection Agency’s (EPA) Air Quality System (AQS) database contains air monitoring data collected by numerous Tribal, state, local, and federal agencies, compiled in a central, publicly available location for use in tasks requiring such data, such as air quality modeling. As part of a larger project for the Western Regional Air Partnership (WRAP) and its Tribal Data Work Group (TDWG), the Institute for Tribal Environmental Professionals (ITEP) and EN3 Professionals, LLC (EN3) were asked to examine various additional datasets and compare them with AQS data to see if there were gaps in air monitoring data for Tribal lands (i.e. data collected on Tribal lands but not included in the AQS database). This report presents the results of this study.

2.0 Methodology

Upon starting the overall project for the WRAP, we first created a GIS model with two primary base layers: one depicting the 15 WRAP states, and another showing Tribal Lands within the WRAP region (source data from the U.S. Census Bureau's Master Address File/Topologically Integrated Geographic Encoding and Referencing [MAF/TIGER] Database). The Tribal lands layer was filtered to show only federally-recognized American Indian areas (reservations and off-reservation lands held by Tribes), American Indian joint-use areas, and Alaska Native Village Statistical Areas.

We began the AQS study by downloading a list of all AQS monitoring site locations (active and closed) from the EPA’s Air Data website. We imported the AQS site locations to the GIS model, clipped it to the WRAP region, and filtered it to show just the active monitoring sites (with no “Site Closed Date” entered; see GIS layer “AQS Sites\_WRAP States\_Active”). We then created two GIS layers with the active AQS sites data, for use in analysis:

1. we clipped the data to include all sites located on Tribal lands (regardless of owning agency);
2. we also filtered the layer to show just the sites identified as Tribal sites in the database (i.e. the “Tribe Name” field was filled in, regardless of whether or not it was located on Tribal lands).

It should be noted that although we used the active sites from the AQS site locations file (which is current as of May 21, 2018), not all of these sites have data reported for any given year in the AQS database. Nonetheless, we feel that this “master list of monitoring sites on Tribal lands” was the best option for comparison with other data sources described below.

The Tribal Air Monitoring Support (TAMS) Center provided two lists of Tribal air monitoring instruments and associated monitoring site locations: one for all EPA regions except Region 8, with details and geographic coordinates, and an older list with Region 8 Tribes and monitors, but no geographic coordinates. We imported the first list (including all EPA regions except Region 8) into the GIS model for spatial comparison with the AQS dataset (“AQ Tribal Monitoring\_TAMS List” layer). As the second list of Tribal air monitoring sites from TAMS (for EPA Region 8) did not have geographic coordinates, we were unable to follow the same protocol and to compare specific sites between this list and the AQS list. Instead we went through the TAMS Region 8 list, and noted how many monitors were in the AQS list for each Tribe or reservation in the TAMS list.

We next examined the EPA’s AirNow website and noted that following links to download AirNow monitoring site information brings one to the same Air Data website with the AQS monitoring sites. Thus it appears that monitoring sites submitting data to AirNow are already incorporated into the AQS site locations list. We also checked the AirNow Tribal Partners list to see if any were not submitting data to the AQS.

After obtaining an account with the Intermountain West Data Warehouse (IWDW) website, we examined the list of monitoring datasets in the IWDW database.

We are aware that there may be (or may have been) additional monitoring sites located on Tribal lands for specific purposes beyond the mission of AQS (to examine mercury deposition, acid rain, etc.). As these sites are typically transient in nature and typically not owned or operated by Tribes, we did not include these specialty air monitoring sites in this analysis.

To accompany the model, we created a spreadsheet with several tabs to summarize various components of the task, as referenced below.

3.0 Results & Discussion

The first tab in the spreadsheet (“AQS Sites on Tribal Lands”) shows the list of 158 active AQS sites on Tribal lands. We found two monitors that appear to have duplicate entries in the list, highlighted in yellow and discussed in the “Notes” field. These data are also presented graphically in the GIS model, in the layer called “AQS Sites on WRAP State Tribal Lands.”

The second tab (“AQS Sites w-Tribe Name”) shows the 135 active AQS sites identified as Tribal in the database. Examination of the corresponding layer (“AQS Sites WRAP States Active w-Tribe Name”) in the GIS model shows that 10 of the 135 sites lie outside of the boundaries of Tribal lands (Although in the case of the site belonging to the Pala Band of Mission Indians, this may be due to slight inaccuracies in either the coordinates for the site or the Tribal lands GIS layer).

The third spreadsheet tab (“TAMS List-no EPA R8”) shows the results of the comparison of the first TAMS list of Tribal monitoring sites with the AQS dataset. Four sites (at the top of the list) are highlighted in yellow to indicate that they may not appear in the AQS list (although see the notes at the right for commentary on three of these). We also noted 12 additional sites in the TAMS list which do appear to correlate with Tribally owned sites in the AQS list, but for which the coordinates in one or the other list appear to be off to one degree or another. Two sites in the TAMS list had significant errors in the coordinates, and one site overlaps with a site listed in the AQS database as being owned by the EPA (see Notes). The fourth tab (“TAMS List-EPA R8”) shows the results of the qualitative comparison of the Region 8 TAMS list with the sites in the AQS database.

The “AIRNOW Tribal Partners” tab shows the three Tribes listed as partners without corresponding active sites in AQS the list. Note, however, that closed sites were found for each of these three.

Upon examination of the datasets found on the IWDW monitoring database, it was noted that the datasets are either all from federal sources already included in AQS, or from commercial sources that did not appear to be relevant to this task.

Finally, we generated a layer of AQS sites located within Tribal boundaries that are not identified with a Tribe (i.e. the “Tribe name” field was left blank) in the AQS database (see layer “AQS Sites Incomplete Tribe Info” in GIS model). We placed this list in another tab in the spreadsheet (same name as the GIS layer), and commented that some of these sites are listed as being owned by Tribes, but not labeled as such in the “Tribe name” field. It should be noted that these Tribes may wish to amend the data in their AQS accounts for the sites, as individuals querying the AQS database for Tribal monitoring sites by using only the “Tribe name” field will not otherwise find these sites. There are also sites in the first two tabs of the spreadsheet that are identified as Tribal but are not owned by the Tribe. Applicable Tribes may want to consider asking to have the Tribal designation removed from these sites.

4.0 Attachments

Files accompanying this report include the spreadsheet titled “Tribal AQ Monitoring Sites\_11.21.18.xlsx” and the GIS model titled “ITEP-WRAP Task 1.2.qgs” (in QGIS format— the shapefiles in the accompanying folders can also be opened in other GIS software such as ArcGIS or Google Earth Pro).