**Tribal NEI Data Gap Study**

Prepared for the Institute for Tribal Environmental Professionals
and
Western Regional Air Partnership - Tribal Data Work Group

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1. Introduction

Under the Air Emissions Reporting Requirements (AERR) rule (40 CFR part 51), the U.S. Environmental Protection Agency (EPA) requires state and local air pollution control agencies to submit annual emissions inventories for criteria pollutants to EPA's Emissions Inventory System (EIS). Tribes are also encouraged, although not required, to submit emissions inventory data to the EIS. Once every three years, e.g., 2014, 2017, 2020, etc., the EPA compiles these data, along with other data as necessary to fill in gaps in the state/local/Tribal inventories, to produce the National Emissions Inventory (NEI). The NEI is intended to provide a comprehensive and detailed estimate of emissions of criteria pollutants, criteria precursors, and hazardous air pollutants from air emissions sources throughout the U.S. NEI data are used by various entities for air quality planning and assessment purposes. The Western Regional Air Partnership (WRAP) is currently using data from the 2014 NEI to model ambient air concentrations of certain pollutants for use in updates to State Implementation Plans (SIPs) for the second round of Regional Haze Rule compliance.

In general, Tribes are not required to submit emissions inventories to the EPA, and many Tribes may not have the capacity in their environmental programs to prepare such inventories. There is some concern among users of the NEI, therefore, that it might not accurately represent the breadth of emissions sources located on Tribal lands across the country. As part of a larger project for the WRAP and its Tribal Data Work Group (TDWG), the Institute for Tribal Environmental Professionals (ITEP) and EN3 Professionals, LLC (EN3) were asked to investigate this issue, and to identify gaps or overlaps found in the NEI data for Tribal lands in the western U.S. While the scope of this task did not include checking data quality, we did make an effort to identify obvious mistakes in the data, e.g., locations that were grossly in error.

1. Methodology

*The NEI Data Set*

To begin the Tribal NEI Data Gap Study, EN3 examined the data files available on the 2014 NEI website. We downloaded EPA's "full detail data file" (broken down by individual emissions sources and pollutants) for the point source data category. The other source categories (nonpoint, road, on-road, and events) were not used for this analysis. These other source categories are not associated with geographically identifiable sources or fixed facilities that could be correlated with other data sets. The zipped folder in the download contained two individual files: one for EPA regions 1-5, and another for regions 6-10 (the latter is the only one used for this analysis, as it contains all states and Tribes in the WRAP region). Several additional data files were downloaded from the NEI website and examined. These included the Tribal lands emissions summaries by “Sector” and “Tier 1” source categories, and the “Facility-level by Pollutant” summary file.

The extremely large (nearly four million records) full detail point source file was linked as a table in a Microsoft Access database to enable efficient querying of the data for analysis. Upon inspection it was noted that while the file contains a “tribal\_name” field, none of the records have this field populated. This omission lead to speculation as to whether this file actually contained all point sources identified in the 2014 NEI as stated on the page. By contrast, the facility-level file, originally assumed to be the records contained in the point source file summarized to the facility level (since a given facility can include more than one emissions source), contains 139 facilities with a Tribe name in that field. Upon contacting representatives of the EPA to inquire about the apparent discrepancy, we were informed that the point source file indeed does not contain Tribal sources, and were provided with an additional full detail file with the Tribal sources in question. We expressed our concern about this omission to the EPA, and requested that it be rectified.

Assured that we understood the breadth of the point source data used in the 2014 NEI, EN3 compared the full detail data files to the facility-level summary file. We ultimately decided to use the facility-level summary as the basis for our analysis, since it includes all of the fixed, onshore facilities in the full detail data file from the NEI page as well as the Tribal facilities in the additional full detail file received from the EPA. This facility-level summary data set was added to the existing GIS that we built for a separate task on the project for WRAP and TDWG. We then filtered and clipped it to produce a list of GIS attributes of all NEI Tribal facilities (regardless of whether they are located on or off Tribal lands) and all other sources located on Tribal lands in the WRAP region.

It should be noted that the resulting NEI Tribal Facilities list does not actually include all Tribally-owned facilities, since unfortunately the “tribal\_name” field in the NEI database is not always filled in for Tribally-owned facilities located outside of Tribal lands (one example of which we are aware due to our familiarity with Arizona Tribes is the Portland cement plant in Clarkdale, Arizona, owned by the Salt River Pima-Maricopa Indian Community but located well off their reservation). Tracking down all of the Tribally-owned facilities located off Tribal lands is beyond the scope of this task. Therefore, the resulting list was considered the best available data set for our analyses.

*Additional Data Sets for Comparison*

EN3 compared additional data sets, described below, from four other data repositories, with our NEI Tribal Facilities list, with the specific goal of identifying any significant emissions sources that may not have been included in the 2014 NEI. Sources with actual or potential emissions greater than 100 tons per year (tpy) for criteria pollutants, or 10 tpy for hazardous air pollutants (essentially the Title V major source threshold), were the focus of our work. According to the AERR rule, these are the thresholds for reporting sources individually as points (rather than lumping them in the nonpoint category). Some agencies voluntarily provide information on minor sources for the NEI, but since this is not required, minor sources are inconsistently represented in the NEI’s point source category.

Upon the recommendation of our project partners at ITEP, we contacted ITEP’s Angelique Luedeker for information on Tribal sources that may not be included in the NEI database. Ms Luedeker provided a spreadsheet she maintains showing Tribes that have participated in the EIS for various NEI years, including notes about which data were or weren’t used in the 2014 NEI. An additional table in the spreadsheet identified 18 Title V major sources she had identified during the course of her work that were not included in the 2014 NEI.

EN3 also consulted the EPA’s Toxic Release Inventory (TRI) website, and downloaded a data set of 2014 TRI facilities with reported air emissions for comparison.

As part of another task on this project for the WRAP and TDWG, we communicated with EPA regional staff working on New Source Review (NSR) registration and permitting for Tribal lands in the WRAP region. We requested information on emissions sources from their respective databases. Although these data sets primarily covered minor sources not likely to be included individually in the NEI (most would be lumped into the nonpoint category), there were some larger sources included in the data from Region 8 with emissions above the AERR point source thresholds. We sought similar data from the other regions in the WRAP area, but to date we have only received them from Region 8.

Finally, EN3 accessed and examined the EPA’s regional web pages for Title V permits issued in Indian Country. We generated a list of the active Title V facilities in each region for comparison. Two Tribes within the WRAP region have taken over Title V permitting responsibilities for their lands (the Navajo Nation and the Southern Ute Indian Tribe). Their web-based data were consulted for Title V facilities to add to our lists.

*Analysis*

To look for gaps in the NEI Tribal Facilities list, EN3 loaded the data sets described above into our GIS as layers, and compared them with an NEI Tribal Facilities list layer using geoprocessing tools. Geographic coordinates for a given facility were sometimes found to differ among datasets. We therefore generated a small buffer around the points in the NEI Tribal Facilities list layer for these analyses in an attempt to avoid flagging facilities as having been missed in the NEI when actually theses sources were just mapped slightly differently. After compiling the preliminary list of data gaps with the GIS analyses, EN3 also searched the 737 entries in the NEI Tribal Facilities list using Microsoft Excel’s “find” function for unique portions of the name of each gap facility. We found several emissions sources that actually were in the NEI, but for which the coordinates were so far off in one dataset or the other as to avoid capture by even the buffered points in our GIS analysis. (Note that we could not merely combine the files and sort them by name to find data gaps, because the facilities were often named somewhat differently among the various datasets.)

EN3 also looked for overlaps in the NEI Tribal Facilities list by searching for duplicate entries in the list. We used database queries, geoprocessing tools, and visual scans while working with the data to look for situations in which a given facility might be reported twice (for example having one entry with the “tribe\_name” field filled in, and another without).

1. Results & Discussion

Our ultimate objective is to provide an enhancement to the accuracy and utility of the 2014 NEI as it applies to Tribal lands in the WRAP region. In addition to its potential use for the modeling WRAP is currently conducting for Regional Haze Rule SIP updates, we hope that the modest number of data gaps and overlaps identified here may be taken into account in subsequent NEI productions to improve overall emissions estimates. The intent of this study is not to find fault with the 2014 NEI. Similarly, we are most appreciative of the many people at the EPA along with their state, local, and Tribal partners who work with extremely large and complicated data sets in a massive undertaking to estimate air pollutant emissions across the entire United States.

*Results from Different Data Sets*

The lists of major sources we generated for the EPA regions (including permit data from the EPA regions and from the Navajo Nation and the Southern Ute Indian Tribe) were used as the primary basis of our comparison with the NEI Tribal Facilities list. The only additions from other data sets came from 2014 emissions data provided by the EPA Region 8 Tribal NSR staff. Fourteen facilities in this data set had reported emissions for that year above the AERR point source thresholds, so we added these facilities to our list for Region 8, despite their not being identified on the EPA Region 8 permits web page as Title V sources at present. Otherwise, the data provided by ITEP and regional Tribal NSR staff were used for other aspects of the analyses. The ITEP spreadsheet provided helpful context regarding the history of Tribal data submissions to recent NEI productions, and which data sources EPA used to supplement submissions by particular Tribes. The NSR data sets provided supplementary information including facility-wide emissions totals for many sources, and an additional set of geographic coordinates for situations in which the coordinates in the NEI appeared to be incorrect. Analysis of the 2014 TRI data set did not yield additional source information. The only TRI facilities not included in the NEI Tribal Facilities list were small, non-Title V sources that are presumed to be accounted for elsewhere in the NEI.

It is important to consider how the different types of facilities are accounted for in the NEI. In some cases, the emissions from facilities we identified as not being included in the 2014 NEI may actually have been accounted for in a different source category. For several sectors the emissions from specific source types may be included in either the point or nonpoint data categories depending on the amount and specificity of data received by the EPA from the state, local, and Tribal agencies. One example that is particularly relevant to our results is the oil and gas production sector, for which emissions are generally estimated at the county level using an EPA database tool and included in the nonpoint source category. Some agencies, however, report source-specific emissions data to the EPA from large oil and gas production facilities such as natural gas compressor stations. These facilities are then included in the point source category, and their emissions are subtracted from the nonpoint emissions estimates for the associated county. With this in mind, the data gaps EN3 found are presented below in two categories, depending on level of certainty.

*Significant Emissions Sources on Tribal Lands Not in the 2014 NEI*

We identified five significant emissions sources on Tribal lands that do not appear to have been accounted for in the 2014 NEI (see Table 1 below), including three landfills and two electric generating units. These are located on the Salt River, Fort Mohave, and Skull Valley Reservations. According to the Technical Support Document for the 2014 NEI, both source types are supposed to be included in the point source category (although in the case of landfills we should note that mercury emissions are estimated separately using EPA data and included in the nonpoint source category). Also, although the Tri-Cities Landfill on the Salt River Reservation has been closed since 1993, and landfill gas is currently being captured and piped offsite to the Tri-Cities Landfill Energy Facility for combustion and power generation, the landfill itself is still operating under a Title V major source permit for the gases not captured by the system.

**Table 1. Significant emissions sources on Tribal lands not included in the 2014 NEI[[1]](#footnote-1)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tribal Land** | **Facility Name** | **Type of Operation** | **Latitude** | **Longitude** |
| Salt River Reservation | Salt River Landfill | Landfill | 33.5061 | -111.7867 |
| Skull Valley Reservation | Tekoi Landfill | Landfill | 40.3583 | -112.7244 |
| Salt River Reservation | Tri-Cities Landfill | Landfill | 33.4720 | -111.8372 |
| Salt River Reservation | Tri-Cities Landfill Energy Facility | Electrical Generating Plant | 33.4832 | -111.8179 |
| Fort Mohave Indian Reservation | South Point Energy Center | Natural Gas-Fired Combined Cycle Electrical Generating Plant | 34.8675 | -114.5327 |

*Significant Emissions Sources on Tribal Lands that May Not Have Been Included in the 2014 NEI*

This larger source population includes 39 facilities in three broad categories across ten reservations. It represents facilities not included in the NEI point source category, but whose emissions may have been accounted for to one degree or another in the nonpoint source category (see Table 2 below). The first 37 facilities in the group are in the oil and gas production sector (different terminology in the “Type of Operation” field comes from the NAICS/SIC codes used by the operators when they applied for their permits), which as mentioned above can be included in either the point or nonpoint source categories in the NEI. These facilities all have actual or potential emissions in excess of the thresholds in the AERR rule to be reported as point sources, however, and it is therefore appropriate to include them as such in the NEI. “Large gas compressor stations” (which describes most of the 37 oil and gas facilities listed below) are also specifically mentioned in the NEI Technical Support Document as facilities typically placed in the point source category. There are numerous examples of these facilities in the NEI point source data set. While we do not have first-hand experience using the EPA tool to estimate emissions from the oil and gas production sector, it seems likely that estimates made without including these large facilities as distinct sources could under-predict the actual emissions for the county in question, especially when more than one such source is located in a given county. Additionally, when modeling the impacts of emissions on ambient air quality, more accurate results are obtained by considering large-emitting facilities as point sources (or collections of point sources as the case may be) than as nonpoint or area sources. This is especially true when looking at finer geographic scales or for receptors located close to the facility. Averaging emissions over an entire county can significantly under-represent the local impacts of individual large sources.

The final two facilities, the Kevlar-coating facility on the Fort Totten - Spirit Lake Indian Reservation and the industrial sand mining and processing plant on the Navajo Nation, are both in sectors whose emissions should be accounted for in the NEI’s nonpoint source category. We include them here because, in both cases, one or more facilities in the same general sector were found in the NEI point source data set. Further, we feel that the same AERR point source threshold and modeling accuracy arguments made above for large oil and gas production sources apply to these facilities.

**Table 2. Significant emissions sources on Tribal lands that may not have been included in the 2014 NEI**

| **Tribal Land** | **Facility Name** | **Type of Operation** | **Latitude** | **Longitude** |
| --- | --- | --- | --- | --- |
| Crow Indian Reservation | Hardin Compressor Station | Pipeline Transportation of Natural Gas | 45.7389 | -107.5440 |
| Fort Berthold Indian Reservation | Blue Buttes Compressor Station and Pump Station | Crude Petroleum & Natural Gas | 47.8614 | -102.7841 |
| Fort Berthold Indian Reservation | Clark's Creek Compressor Station | Natural Gas Transmission | 47.9079 | -102.7582 |
| Fort Berthold Indian Reservation | Furbearer East | Crude Petroleum & Natural Gas | 47.8487 | -102.7151 |
| Fort Berthold Indian Reservation | Huron Pad - FBR 151-94-26B-35-IH, 2H, and 3H Wells | Crude Petroleum & Natural Gas | 47.8759 | -102.6796 |
| Fort Berthold Indian Reservation | Maroon Pad, FBR 152-93-7D-6-1H, 2H, 3H and 4H Wells | Crude Petroleum & Natural Gas | 47.9913 | -102.6275 |
| Fort Berthold Indian Reservation | Riverview 32 Pad - Riverview 1-32H, 102-32H | Crude Petroleum & Natural Gas | 47.9479 | -102.7474 |
| Fort Berthold Indian Reservation | Snakes Pad | Crude Petroleum & Natural Gas | 47.9932 | -102.7662 |
| Fort Berthold Indian Reservation | Stations #1-6 | Natural Gas Transmission | 47.7291 | -102.5902 |
| Fort Berthold Indian Reservation | Targa Badlands Junction Compressor Station | Oil and Gas Field Services | 47.7724 | -102.7277 |
| Fort Berthold Indian Reservation | Turtles/Butterflies Pad | Crude Petroleum & Natural Gas | 47.9361 | -102.7326 |
| Jicarilla Apache Nation | Lindrith Compressor Station | Crude Petroleum & Natural Gas | 36.3099 | -107.3965 |
| Jicarilla Apache Nation | Los Mestenios Compressor Station | Oil and Gas Field Services | 36.4508 | -107.3172 |
| Jicarilla Apache Nation | Ojito Compressor Station | Oil and Gas Field Services | 36.5071 | -107.1929 |
| Jicarilla Apache Nation | Trunk E&H Receiver | Other - Liquidreceiving | 36.4989 | -107.1906 |
| Pueblo of Laguna | Compressor Station #6 | Natural Gas Transmission | 35.0164 | -107.4050 |
| Pueblo of Laguna | Laguna Compressor Station | Natural Gas Transmission | 34.9932 | -107.3160 |
| Southern Ute Indian Reservation | Midway Compressor Station | Crude Petroleum & Natural Gas | 37.0924 | -107.5760 |
| Southern Ute Indian Reservation | Treating Site #7 | Crude Petroleum & Natural Gas | 37.0260 | -107.9172 |
| Uintah and Ouray Reservation | Antelope Flats/Sand Wash Compressor Stations & South Central Tank Battery | Crude Petroleum & Natural Gas | 39.9957 | -109.4683 |
| Uintah and Ouray Reservation | Chapita Compressor Station | Crude Petroleum & Natural Gas | 40.0361 | -109.4263 |
| Uintah and Ouray Reservation | Chipeta Gas Plant | Natural Gas Liquids | 40.0366 | -109.4237 |
| Uintah and Ouray Reservation | Cottonwood Wash Compressor Station | Crude Petroleum & Natural Gas | 40.0097 | -109.5439 |
| Uintah and Ouray Reservation | Coyote Wash Compressor Station | Crude Petroleum & Natural Gas | 40.0386 | -109.4407 |
| Uintah and Ouray Reservation | Fidlar Compressor Station | Pipeline Transportation of Natural Gas | 40.0397 | -109.4569 |
| Uintah and Ouray Reservation | Island Compressor Station | Crude Petroleum & Natural Gas | 39.9598 | -109.7169 |
| Uintah and Ouray Reservation | Little Canyon Unit Compressor Station | Crude Petroleum & Natural Gas | 39.8969 | -109.6058 |
| Uintah and Ouray Reservation | Natural Buttes Compressor Station | Pipeline Transportation of Natural Gas | 40.0170 | -109.5080 |
| Uintah and Ouray Reservation | Ouray Compressor Station | Crude Petroleum & Natural Gas | 40.0097 | -109.5439 |
| Uintah and Ouray Reservation | River Bend Dehydrator Site & Accompanying Wellsites | Crude Petroleum & Natural Gas | 39.9485 | -109.7706 |
| Uintah and Ouray Reservation | Riverbend Compressor Station | Crude Petroleum & Natural Gas | 39.9821 | -109.8475 |
| Uintah and Ouray Reservation | TAP-5 Compressor Station Co-located with RBU 11-02F | Crude Petroleum & Natural Gas | 39.9751 | -109.6361 |
| Uintah and Ouray Reservation | Wolf Flat Tank Battery | Crude Petroleum & Natural Gas | 39.5668 | -109.7503 |
| Uintah and Ouray Reservation | Wonsits Valley Compression Station | Crude Petroleum & Natural Gas | 40.1400 | -109.4940 |
| Ute Mountain Indian Reservation | Barker Creek Compressor Station | Crude Petroleum & Natural Gas | 36.9306 | -108.2806 |
| Wind River Indian Reservation | Riverton Dome Facility | Crude Petroleum & Natural Gas | 42.9387 | -108.3469 |
| Wind River Indian Reservation | Steamboat Butte E5 Tank Battery | Crude Petroleum & Natural Gas | 43.2653 | -108.9042 |
| Fort Totten - Spirit Lake Indian Reservation | Kevlar Coating Facility | Fabric Coating Mills | 47.9791 | -99.0062 |
| Navajo Nation | Preferred Sands of Arizona | Industrial sand mining and processing | 35.2009 | -109.2371 |

*Duplicates in the NEI Point Source Data Set*

Apparent duplicate entries were found for just one facility in the NEI Tribal facilities data set examined in this study. The Potlatch Land and Lumber St. Maries Complex, on the Coeur d’Alene Reservation, has separate entries in the EIS database with and without the Tribal identifier in the “tribe\_name” field (listed under EIS Facility IDs 8271711 and 7415411, respectively). Although it is possible that the Tribe and the state separately provide emissions data for different operations at the facility, this seems unlikely. This facility is located entirely within the boundaries of the Coeur d'Alene Reservation, and emissions permitting authority lies with the EPA. Another set of potential duplicate entries was found for a gas fractionating plant located on the edge of the Navajo Nation in New Mexico. Upon further research, however, we found that a single source at the plant is located within the boundary of the reservation, and permitted separately by the Navajo Nation from the rest of the facility.

1. Conclusions and Recommendations

A primary goal of this study is to bring to light any significant data gaps and overlaps in the 2014 NEI for emissions sources on Tribal lands. With regard to the modeling the WRAP is currently undertaking for Regional Haze Rule SIP updates, the tables included here of actual or possible data gaps should improve the accuracy of emissions data used for the next round of modeling. The various data sets used for this task do not include the detailed, source-level emissions data typically required for modeling. We did receive facility-level emissions data for 29 of the facilities identified in our lists (mostly from 2014). EN3 will provide them in a spreadsheet accompanying this report to inform decisions by the WRAP as to whether to pursue the source-level emissions for some or all of the facilities. Actual emissions for the facilities may be available from the EPA regional offices, the Navajo Nation, and the Southern Ute Indian Tribe. Permitted emissions for each facility could be obtained by downloading and reviewing each of the Title V permits, if the WRAP decides to include these sources in their models.

In addition to the facility level emissions data mentioned above, the spreadsheet accompanying this report includes more details for the missing facilities from our results. This compilation also includes the list of 737 NEI Tribal Facilities with notes on a few sources whose coordinates were found to be significantly off from their actual locations.

1. Note that the horizontal datum for all coordinates presented in this report is WGS84. Negative values of longitude indicate west of Greenwich. [↑](#footnote-ref-1)