

**2019 Annual Report**

**SO2 Emissions for the San Juan Generating Station**

**Ongoing Requirements for the 2015 Data Requirements Rule**

Prepared by the New Mexico Environment Department

Air Quality Bureau

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**Introduction**

Pursuant to Section 51.1205 of the Data Requirements Rule (DRR) for the 2010 1-Hour Sulfur Dioxide (SO2) Primary National Ambient Air Quality Standard (NAAQS) (80 FR 51052, 8/21/15), air agencies are required to submit an annual report to their respective U.S. Environmental Protection Agency (EPA) Regional Administrator for areas which demonstrated attainment for the 2010 SO2 NAAQS via modeling of actual emissions. This report shall document the annual SO2 emissions of each applicable source and provide an assessment of the cause of any emissions increase from the previous year. The first report was due by July 1 of the calendar year after the effective date of the area’s initial designation (i.e., by 7/1/2018).

All areas of New Mexico have been designated Attainment/Unclassifiable through three rounds of designations by the EPA (83 FR 1184, 1/9/18). As part of the Round 3 designation process, the 2015 DRR stipulated that, for those areas surrounding sources that emit 2,000 tons per year (TPY) or more of SO2, states must characterize air quality in proximity to the source using one of the following three methods: (1) ambient air monitoring; (2) modeling of either actual or allowable emissions; or (3) demonstration of federally enforceable emissions limitations that limit emissions of an applicable source to below the 2,000 TPY threshold.

In New Mexico, the only source exceeding the 2,000 TPY threshold was the San Juan Generating Station (SJGS) in San Juan County. This source, working with the New Mexico Environment Department (NMED), decided to characterize that area’s air quality by modeling actual emissions. Modeling submitted to EPA in January 2017 demonstrated that this area met the 2010 1-hour SO2 Primary NAAQS, using quality-assured data from the SJGS’ continuous emissions monitoring system (CEMS) for the years 2013-2015.

This is the second annual report required by the 2015 DRR. NMED has assessed the 2016, 2017 and 2018 emissions data generated by the SJGS CEMS. Since emissions for all three years have decreased from 2015 levels and 3-year averages also show an emissions decrease, NMED recommends that no new modeling for this source be required. In addition, because two of the four generating units have been permanently shut down, NMED anticipates that this source will emit less than the 2,000 TPY threshold in the future.

**Emissions Data Summary – San Juan Generating Station**

SO2 emissions from SJGS are recorded by the station’s CEMS. Data is quality-assured by the source and submitted annually to NMED. A summary of the main trends in SO2 emissions are shown in Table 1, below.

**Table 1:** Trends in SO2 emissions from San Juan Generating Station by year.

|  |  |  |  |
| --- | --- | --- | --- |
| **Year** | **Annual 1-hour average SO2 emissions (lbs./hr.)** | **Annual 1-hour maximum SO2 emissions (lbs./hr.)** | **99th percentile of 1-hour daily maximum SO2 emissions (lbs./hr.)** |
| 2013 | 1364.77[[1]](#footnote-2) | 6170.16[[2]](#footnote-3) | 4191.17 |
| 2014 | 1112.82 | 5654.98 | 3826.12 |
| 2015 | 772.98 | 5373.22 | 4565.88 |
| 2016 | 649.47 | 5121.94 | 3637.60 |
| 2017 | 703.71 | 3515.77 | 2997.42 |
| 2018 | 270.602 | 3266.61 | 1300.1 |

In 2017, the annual 1-hour average SO2 emissions increased from 2016 due to increased unit operational efficiencies. During 2016, all four units experienced more downtime due to maintenance issues or other unexpected malfunctions. However, in 2017, all four units maintained a higher operational efficiency which resulted in less downtime and therefore, increased loads (2016 average load 372.4 MW/day; 2017 average load 383.6 MW/day) and associated emissions. In 2018 the annual 1-hour average SO2 emissions decreased from 2017 due to the shutdown of Units 2 and 3. The average load for Unit 2 was 301.1 MW/day, and 453.7 MW/day for Unit 4. The past three years (2016-2018) show a decrease in emissions when compared to the modeled years of 2013-2015. Also, the annual maxima for 2016-2018 as well as the 99th percentile of daily maxima for 2016-2018 show significant decreases from the modeled years of 2013-2015.

In addition to annual trends shown by the CEMS data in Table 1 above, total SO2 emissions data submitted annually to NMED and EPA show a similar trend. This trend is shown in Table 2, below. Emissions increased in 2017, comparted to 2016 emissions due to increased operational efficiencies; however, both 2016 and 2018 are below 2015 levels, the lowest of the levels for the modeled years.

**Table 2:** Total annual SO2 emissions by year[[3]](#footnote-4).

|  |  |  |
| --- | --- | --- |
| **Year** | **Total SO2 emissions (tons)** | **Change in Total SO2 emissions from previous year (tons)** |
| 2013 | 6075.9 |  |
| 2014 | 4989.4 | <1086.5> |
| 2015 | 3499 | <1490.4> |
| 2016 | 2923.1 | <575.9> |
| 2017 | 4535.1[[4]](#footnote-5) | 1612 |
| 2018 | 1246.6 | <3288.5> |

The initial attainment demonstration, modeling actual emissions, used the average of the years 2013-2015. The tables above show that annual emissions (except for 2017), average hourly emissions, maximum emissions and 99th percentile daily maxima of hourly emissions for 2016-2018 are lower than each year modeled. To compare trends since the modeling was performed, Table 3, below, summarizes the 3-year averages for each of these parameters.

**Table 3:** Trends in 3-year averages. Note that 2014-2016, 2015-2017 and 2016-2018 averages are significantly below the modeled years’ (2013-2015) average.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Years** | **Average 1-hr SO2 (lbs./hr.)** | **Average Maximum daily 1-hr SO2 (lbs./hr.)** | **Average 99th percentile maximum 1-hr SO2 (lbs./hr.)** | **Average total SO2 (tons/year)[[5]](#footnote-6)** |
| 2013-2015 | 1083.52[[6]](#footnote-7) | 5732.79 | 4194.39 | 4854.77 |
| 2014-2016 | 845.09 | 5383.38 | 4009.87 | 3803.83 |
| 2015-2017 | 708.72 | 4670.31 | 3733.63 | 3652.4 |
| 2016-2018 | 541.26 | 3968.11 | 2645.04 | 2901.6 |

**Monitoring Data Summary – San Juan Substation, NMED Monitor 1H**

NMED operates an ambient air monitoring station (1H San Juan Substation, 35-045-1005) located at 36.79667 degrees latitude and **-**108.47250 degrees longitude, approximately 2.34 miles nearly due west of SJGS. This monitor is the nearest ambient air monitor to SJGS. See Figure 1, below.

**Figure 1:** Google Earth image calculating the distance between the San Juan Substation monitor and the stacks at San Juan Generating Station.



This monitor is not located near enough to SJGS to be used for regulatory purposes related to the DRR. However, a review of the monitoring data indicates that SO2 concentrations in the ambient air are regularly well below the SO2 standard. The form of the standard, the 99th percentile daily 1-hr maximum concentration (ppb), is shown in column 4 of Table 4, below.

**Table 4:** San Juan Substation SO2 monitor data summary, 2013–2018.[[7]](#footnote-8)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Year** | **Mean SO2 concentration (ppb)** | **Maximum SO2 concentration (ppb)** | **99th percentile concentration (ppb)** | **Number of hours exceeding 75 ppb** |
| 2013 | 2.60  | 32 | 25 | 0 |
| 2014 | 0.837  | 18 | 14 | 0 |
| 2015 | 0.058  | 1 | 1 | 0 |
| 2016 | 1.18  | 16 | 8 | 0 |
| 2017 | 3.24  | 30 | 16 | 0 |
| 2018 | 1.41 | 15 | 9 | 0 |

No hourly concentration exceeded 75 ppb for the time period 2013–2018. The maximum 99th percentile concentration of 25 ppb occurred in 2013.

**Discussion and Recommendation**

The above summary tables show that for all parameters, SO2 emissions from the San Juan Generating Station have decreased since the 2013-2015 modeling, which showed the area in attainment of the 2010 1-hour SO2 primary standard. Although 2017 showed a slight increase in the average hourly emissions and the annual emissions from the previous year, this trend did not continue since two of the four units at the facility have permanently shut down as of December 2017. Furthermore, all other emissions trends have steadily decreased since the modeled years, which showed the area in attainment of the 2010 1-hr SO2 primary NAAQS.

Monitoring data near SJGS also show that ambient air quality meets the 2010 1-hour SO2 primary standard of 75 ppb for all years, 2013–2018.

Since emissions are decreasing and are expected to be significantly lower in future years, and since monitoring data near SJGS show acceptable SO2 concentrations for 2013–2018, NMED recommends that further modeling is not warranted to assess any expected changes in recent air quality, and that EPA not require re-modeling for 2014-2016, 2015-2017 or 2016-2018.

1. This value has been corrected from the 2018 report. In 2018 a value for a single hour was mistakenly used (i.e., 1627.41) instead of an average of all 8,760 hourly values (i.e., 1364.77). [↑](#footnote-ref-2)
2. This value has been corrected from the 2018 report, due to a typo (i.e., 5170.16[sic]). [↑](#footnote-ref-3)
3. The 2018 report used eia.gov data for 2013-2016, and NMED data for 2017. For the 2019 report, *NMED-AQB Facility Actual Emissions* were used for all years. This data is publicly available through NMED’s *Emissions Analysis Tool* <https://eatool.air.net.env.nm.gov/aqbeatool/>. [↑](#footnote-ref-4)
4. The 2018 report mistakenly used the value for 2016 emissions (i.e., 2923) in the place of 2017 emissions (i.e. 4535.1). [↑](#footnote-ref-5)
5. Because NMED data are being used for this report as shown in Table 2, the 3-year averages for total SO2  (tons/year) have been changed accordingly in Table 3. [↑](#footnote-ref-6)
6. As indicated in Table 1, the 2013 value for Annual 1-hour average SO2 emissions (lbs./hr.) in the 2018 report was incorrect (i.e. 1627.4), thus when this value is corrected (i.e., 1364.77), the corresponding 3-year Average 1-hr SO2 (lbs./hr.) for 2013-2015 in Table 3 changes accordingly. [↑](#footnote-ref-7)
7. The 2018 report used data from the NMED Air Emissions Map and Data at <http://nmaqinow.net/> , but this data had not been certified. Therefore data in this report has been retrieved from *Interactive Map of Air Quality Monitors* <https://www.epa.gov/outdoor-air-quality-data/interactive-map-air-quality-monitors>. [↑](#footnote-ref-8)