Exceptional Events Mitigation Plan
for the
Coso Junction PM10 Planning Area

Revised Draft – July 2018

Exceptional Events Caused by Windblown Dust from Flash Flood Silt Deposits:

August 7, 2013
September 25, 2013
February 16, 2014
April 25, 2014
December 20, 2017
1.0 Summary of Exceptional Events

On July 28, 2013, heavy rains fell in a matter of hours causing flash floods that inundated low-lying areas in the Rose Valley. This area comprises the bulk of the Coso Junction PM10 Planning Area (CJPA) (Figure 1.1). The entire valley floor, including US 395 and Gill Station Road, was inundated with silts and soils eroded by runoff from the Inyo Mountain range. These flood-borne materials remained in the low-lying areas after the floodwaters receded (Figure 1.2).

Although Caltrans and local owners cleaned up deep silt deposits from US 395 and Gill Station Road, the extensive deposits on the natural valley floor remained. These deposits dried and would later become significant sources of PM10 emissions during wind events, especially those events characterized by strong westerly winds driven down the east face of the Sierra Nevada range and across the floor of the Rose Valley. Following the flash flood, elevated PM10 levels were frequently monitored at the Coso Junction monitor site when winds were greater than about 7 m/s. Wind events that occurred on August 7, 2013, September 25, 2013, February 16, 2014, April 25, 2014, and December 20, 2017, resulted in exceedances of the National Ambient Air Quality Standard (NAAQS) for PM10 measured at the Great Basin Unified Air Pollution Control District’s (District) Coso Junction PM10 monitoring station.

PM10 air quality exceedances caused by flash flood events fall under the category of a natural event, which EPA defines as “one in which human activity plays little or no direct causal role in the generation of emissions.” (40 CFR 50.1(k)) The “not reasonably controllable or preventable,” criterion applies to natural events, including natural sources and any contributing anthropogenic sources and activities. Following the flash flood, Caltrans and property owners removed silt deposits from roads and road shoulders as a highway safety measure. This action helped to reduce dust emissions from roads and adjacent areas. The silt-laden flood waters spread much of the material into outlying undisturbed desert areas. Windblown dust emissions from undisturbed desert areas would be considered not reasonably controllable or preventable according to EPA (80 FR 72858). Lower PM10 monitor concentrations in 2015 suggest that the flood deposits in the desert areas are in the process of being naturally stabilized through vegetation growth and surface crusting. Because reasonable steps were taken to prevent dust emissions from areas with human activity and the remaining dust emissions were coming from natural desert areas which EPA would consider not reasonably controllable or preventable, criterion 2 was satisfied. Therefore, this documentation primarily addresses the first criterion, that “the event affected air quality in such a way that there exists a clear causal relationship between the specific event and the monitored exceedance or violation.”
Figure 1.1 Coso Junction Planning Area located in the southern portion of Inyo County, California
2.0 Geographic Setting and Air Quality

The Coso Junction PM10 Planning Area (CJPA) is located in Eastern California in the southern portion of Inyo County which is a part of the Great Basin Unified Air Pollution Control District (Figure 2.1). This planning area is in arid desert area that receives less than 5 inches of rainfall per year. The area is rural in nature and sparsely populated. The principle PM10 monitoring site is located near the Coso Junction rest area in the Rose Valley at an elevation of 3,386 feet above sea level (ASL). This valley is flanked by the Sierra Nevada mountain range which rises to the west to 10,000 feet ASL, and the Coso Range to the east, which rises to over 8,000 feet ASL. The China Lake Naval Air Weapons Station, which covers most of the CJPA, is generally restricted from public access.

Predominant winds in the CJPA are north-south with an additional westerly component during some storm periods. Air pollution in the Coso Junction Planning Area is dominated by windblown dust transported from Owens Lake (OL), 14 miles north of the CJPA, and is located outside the planning area. Air pollution from District permitted facilities within the CJPA boundaries are located east of the monitor site and due to prevailing winds do not have a
significant impact on monitored PM10 concentrations in the planning area. These sources include the Coso geothermal power operations, military operations at the China Lake Naval Air Weapons Station, and volcanic cinder and pumice mining operations.

Excluding high wind events, winds in the CJPA are generally light at 3 m/s or less and air quality is excellent with PM10 concentrations ranging from 5 to 20 µg/m³ for 24-hour averages and annual PM10 concentrations, averaging 17 µg/m³ (Table 2.1). High wind event days (wind speeds >7 m/s for hourly averages) occur ten to fifteen times each calendar year. Exceedances of the federal PM10 standard (150µg/m³ for a 24-hour average) measured at the District’s Coso Junction monitoring station are listed in Table 2.2.
Figure 2.1 Great Basin Unified Air Pollution Control District and Planning Areas
### Annual PM10 Averages Coso Junction TEOM

<table>
<thead>
<tr>
<th>YEAR</th>
<th>Annual Average of 24 Hour PM10 Average <em>(excluding 24-hr PM exceedances -6 total)</em></th>
</tr>
</thead>
<tbody>
<tr>
<td>2012</td>
<td>15.3 µg/m³</td>
</tr>
<tr>
<td>2013</td>
<td>18.1 µg/m³</td>
</tr>
<tr>
<td>2014</td>
<td>17.7 µg/m³</td>
</tr>
<tr>
<td>2015</td>
<td>15.5 µg/m³</td>
</tr>
<tr>
<td>2016</td>
<td>16.8 µg/m³</td>
</tr>
<tr>
<td>2017</td>
<td>18.3 µg/m³</td>
</tr>
</tbody>
</table>

Table 2.1 Annual Average PM10 Concentrations

### PM10 Exceedances Coso Junction TEOM 2012-2017

<table>
<thead>
<tr>
<th>DATE</th>
<th>24 Hour PM10 Average</th>
<th>Source <em>(from Hourly Wind Direction)</em></th>
</tr>
</thead>
<tbody>
<tr>
<td>3/6/2012</td>
<td>173 µg/m³</td>
<td>Combination: 260-350 deg</td>
</tr>
<tr>
<td>8/7/2013</td>
<td>162 µg/m³</td>
<td>non OL: 140-270 deg</td>
</tr>
<tr>
<td>9/25/2013</td>
<td>157 µg/m³</td>
<td>Non OL: 250-290 deg</td>
</tr>
<tr>
<td>2/16/2014</td>
<td>314 µg/m³</td>
<td>Non OL: 250-270 deg</td>
</tr>
<tr>
<td>4/25/2014</td>
<td>261 µg/m³</td>
<td>Non OL: 230-260 deg</td>
</tr>
<tr>
<td>12/31/2014</td>
<td>673 µg/m³</td>
<td>OL: 350-360 deg</td>
</tr>
<tr>
<td>11/16/2016</td>
<td>266 µg/m³</td>
<td>Non OL: 260-270 deg</td>
</tr>
<tr>
<td>3/31/2017</td>
<td>229 µg/m³</td>
<td>OL: 320-005 deg</td>
</tr>
<tr>
<td>7/29/2017</td>
<td>195 µg/m³</td>
<td>Paving operations; light winds 06:00–07:00</td>
</tr>
<tr>
<td>12/20/2017</td>
<td>166 µg/m³</td>
<td>Non OL: 250-275 deg</td>
</tr>
</tbody>
</table>

* Wind direction range is only for those hours during which the wind event occurred.

Table 2.2 PM10 Monitored Exceedances at Coso Junction

### 3.0 Public Notification and Education Program:
**District’s Health Advisory Program for Dust and Smoke**

The District issues health advisories when air pollution exceeds selected trigger levels based on District Rule 701, the District’s Air Pollution Episode Plan. Health advisory notices are posted automatically to the District’s website, emailed and sent via text message to schools and interested citizens in the affected communities and to local media outlets. Health advisories remain in effect for the remainder of the day on which called and, if appropriate, will be reissued as conditions change. People can sign up for the health advisories at the District’s website ([https://gbuapcd.org/cgi-bin/AdvisorySignUp/Form](https://gbuapcd.org/cgi-bin/AdvisorySignUp/Form), Figure 3.1)

As noted in the District’s Air Pollution Episode Plan (Rule 701), a **Stage 1** air pollution health advisory is issued when hourly particulate pollution (PM₁₀) levels exceed 400 micrograms per
cubic meter ($\mu \text{g/m}^3$) for dust and 100 $\mu \text{g/m}^3$ for wildfire smoke. During a Stage 1 health advisory the District recommends that children, the elderly, and people with heart or lung problems refrain from strenuous outdoor activities in the impacted area(s).

A **Stage 2** air pollution health advisory is issued when hourly particulate pollution levels exceed 800 $\mu \text{g/m}^3$ for dust and 200 $\mu \text{g/m}^3$ for wildfire smoke. With a Stage 2 health advisory the District recommends that everyone refrain from strenuous outdoor activities in the impacted area(s).

The District collects data from its extensive air quality monitoring network (17 permanent stations located throughout the District, see the District’s 2018 Annual Air Quality Monitoring Network Plan) on an hourly basis. The data are polled hourly from the stations in the network and go through a preliminary validation process in the District’s cloud-based database. The data are then posted to the District’s website at 18 minutes after every hour. The data are backed up daily to an offsite location and are retained in the District’s database for five years and then the electronic files are archived indefinitely.

Additionally, the data used to determine whether health advisories need to be issued for wildfire smoke events are reviewed, posted to the District’s website, and then reviewed hourly during an event by a data processing professional. The advisories are evaluated before forwarding them via e-mail and text message. In the case of regional wildfire events, the District consults with other air agencies and with those agencies responsible for addressing wildfire issues, including: the US Forest Service (USFS), the Bureau of Land Management (BLM), CalFire, and others. The District works with these agencies to inform them of the air quality effects an event is having on the people within the District and to provide decisionmakers with the information needed in their determination of where their resources will be most effective most quickly.

The District air pollution health advisory program is not intended to replace the need to control dust and smoke problems in the Eastern Sierra, but it is intended to minimize human exposure to the pollution and to help reduce adverse health effects until dust control measures are imposed and/or fully implemented or the event ends. District Rule 401 addresses fugitive dust emissions and provides voluntary and recommended measures for reducing dust. District Rule 433 specifically addresses emissions from Owens Lake and describes the mitigation measures, in detail, for curtailing emissions from the lakebed. Residents and visitors in the District are encouraged to contact the District with any questions they have about the health advisory program or the District's activities in those areas requiring mitigation.

The District’s website contains information for the public regarding potential health effects of the levels of dust and smoke (https://gbuapcd.org/AirMonitoringData/HealthAdvisories/, Figures 3.2, 3.3). There is also a link to additional information on particulate matter levels and health effects, sources of particulate matter, and descriptions of what is being done in the District to mitigate particulate levels (https://gbuapcd.org/AirMonitoringData/ParticulateMatter/).
Identification of Areas Of Concern

The District’s extensive air quality network monitors impacts from known source areas within the District, the largest being the exposed playa areas of Owens Lake and Mono Lake, and any impacts within the two management areas within the District; Coso Junction and Mammoth Lakes. These monitoring systems consist of instruments measuring particulate matter impacts in real time, providing hourly data to the District and the public via the District’s website. Data are uploaded to the website at 18 minutes past the hour for the previous hour. These data are also color coded to help the public see the impact of any events at a glance (https://gbuapcd.org/) and are on the District’s home page.

Emergency Monitoring System:
Additional Portable Particulate Matter Monitors

The District operates two (2) E-BAMs, configured to monitor PM2.5, that are used during wildfire events to monitor impacts in areas that are not covered by the District’s permanent monitoring network (These monitors can be configured to monitor PM10). The E-BAMs are deployed as wildfires occur and either begin or are forecasted to impact communities within the District. The E-BAMs are prepared in advance of the wildfire season so that they can be deployed within hours of a wildfire beginning to impact a community. These E-BAMs are also connected via satellite to the AirSis network, the data from which are used by the US Forest Service to supplement other monitor data for their Blue Sky predictive model. Data from the model are available online (https://www.airfire.org/data/bluesky-daily/). District staff also uses the Blue Sky model data to help determine the best locations for the installation of the emergency monitors. Data from the emergency monitors are also uploaded to the District’s website on an hourly basis, and are also used in the District’s health advisory system, so that people in the affected areas can get the information needed to determine their outdoor activity level.

Enhanced Community Monitoring

The District is in the process of replacing all of the current continuous PM10 monitors in the communities with continuous PM10/PM2.5 monitors. These monitors will be useful in distinguishing between impacts from windblown dust (generally PM10) and wildfire smoke (generally PM2.5). The first monitor of this type was installed at the District’s White Mountain Research Center/NCORE station in October 2017. The second was installed at the District’s new Lee Vining monitoring station and began operation in April 2018. Monitors of this type will be installed at the District’s Mammoth Lakes, Lone Pine, and Keeler monitoring stations later this year.

The District has received funds through the California State Assembly Bill 617 Community Air Protection Program for monitoring in underserved communities. The District plans to install low-cost Purple Air particulate matter (PM) monitors at schools throughout the District that are located in communities where the District has no permanently-installed monitoring station.
These monitors will provide real-time data for District staff and the public and will be used to characterize particulate matter impacts on children attending those schools.

**Mitigation of Areas of Concern**

The District has been involved in ordering the mitigation of the Owens Lake and Mono Lake dust source areas, as evidenced by the promulgation of the 2016 Owens Valley Planning Area State Implementation Plan (April 13, 2016) and the 1994 Mono Basin Planning Area State Implementation Plan (May 1995). The Coso Junction PM10 Maintenance Plan was promulgated in 2010 to address PM10 concerns of a more localized nature in the Rose Valley. The Coso Junction area typically is impacted by PM10 emission sources from the north, including those from Owens Lake. Mitigation of all of these PM10 source areas is progressing. The Owens Lake mitigation was to be completed by December 31, 2017. Mitigation of the emissions from Owens Lake is driven by District Rule 433: Control of Particulate Emissions at Owens Lake. The Mono Basin mitigation is planned for completion by 2033. The Coso Junction Planning Area is in attainment for the federal PM10 standard.
Figure 3.1 Health Advisory Sign-Up
Dust Alert

Great Basin Unified Air Pollution Control District

May 11-2018 7PM to 8PM

The following locations are experiencing poor air quality

**Keeler**

- PM$_{2.5}$, Stage 2: 3740.3 μg/m$^3$
- PM$_{10}$, Stage 2: 652.1 μg/m$^3$

Eliminate outdoor activities in impacted areas.

Remain indoors with doors and windows closed until the episode is terminated.

Avoid all activities that produce aerosols, dust, fumes and other irritants.

[Camera] [Live Data]

**Bishop**

- PM$_{10}$, Stage 1: 496.3 μg/m$^3$

Minimize outdoor activity.

Children, the elderly, and people with heart or lung problems refrain from strenuous outdoor activities in the impacted area.

Outdoor physical education classes, sports practices, and athletic competitions should be rescheduled or cancelled if practicable.

[Camera] [Live Data]

**Lone Pine**

- PM$_{10}$, Stage 1: 693.4 μg/m$^3$

Minimize outdoor activity.

Children, the elderly, and people with heart or lung problems refrain from strenuous outdoor activities in the impacted area.

Outdoor physical education classes, sports practices, and athletic competitions should be rescheduled or cancelled if practicable.

[Camera] [Live Data]

Figure 3.2 Dust Alert Notification
Figure 3.3 Wildfire Smoke Notification
4.0 Mitigation Plan Review

This exceptional events mitigation plan will be presented to the public for the statutory 30-day public review period before submittal of the plan to the California Air Resources Board and US EPA Region IX for approval. As additional exceptional events occur requiring submittal of a mitigation plan, the document will be revised, presented to the public for the 30-day review and then submitted to the ARB and the EPA for approval. Subsequent review of the mitigation plan will take place every five years.