



# Commerce City Government City Council Presentation

September 21, 2020



## Topics for discussion

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### Sept. 21:

- Recent air emissions exceedances
  - Corrective actions and preventative measures
- Suncor community air monitoring

### For future discussion:

- Sand Creek progress
- Environmental goals and metrics for improvement
- Refinery capital investment plan to drive environmental performance
- How we maintain refinery integrity
  - Reliable operations
  - Turnarounds
- Air emissions: how limits are established and how Suncor reports
- Building trust / increasing transparency through enhanced communications to the public (COC work)
- Third-party study: uncovering opportunities for continuous improvement

*On the advisement of Commerce City staff, Suncor requests a study session with Council to address your questions/concerns regarding topics listed for future discussion.*

## 2020 air emissions performance

Suncor's 2020 air emissions targets were established to meet our best historical year of environmental performance (in the past 5 years), which was 2018, and to re-establish our prior progression of reducing exceedances.

- 2020 Environmental Performance thru August (opacity, excess SO<sub>2</sub>, H<sub>2</sub>S)
  - Number of permit limit exceedances
    - ~75% decrease vs. 2019
    - ~20% increase vs. 2018
  - Duration of permit limit exceedances (how long to stabilize/stop the emissions)
    - ~60% decrease vs. 2019
    - ~30% increase vs. 2018
  - Tons of SO<sub>2</sub> emissions
    - ~50% decrease vs. 2019
    - ~10% decrease vs. 2018
- 45% of air emission exceedances in 2020 are a result of four events:
  - March 17: Plant 2 FCC - Main air blower shut down (4 exceedances)
  - May 17: Plant 1 temporary power loss and subsequent shut down (36 exceedances)
  - June 19: TGU sour water leak repair (3 exceedances)
  - Aug 13: Plant 1 boiler trips (7 exceedances)

# Suncor actions taken for 2020 incidents

- Incidents below were thoroughly investigated to identify root causes and corrective actions are assigned to prevent recurrence.
- Major actions taken:
  - **March 17: Plant 2 FCC - Main air blower shut down**
    - DCS emergency shutdown installation & control upgrades
    - Completed air blower electrical repairs
    - Performed additional inspection & testing on electrical relays to identify any additional equipment concerns
    - Substation transformer & grounding systems repairs
    - Shutdown and start-up procedures were updated to cover specific situations
    - Conducted enhanced training to improve response to events
    - Updated inspection procedures to clarify acceptance criteria
  - **May 17: Plant 1 temporary power loss and subsequent shut down**
    - Performed thorough testing and inspection on electrical substation as part of troubleshooting
    - Restored insulating gas pressure on circuit switcher
    - Preventative maintenance activities and inspection procedures were updated
    - Additional alarms added to proactively monitor and address issues prior to failure
    - Updated operations procedures and conducted enhanced training
  - **June 19: Tail gas unit (TGU) sour water leak repair**
    - Damaged piping section and control valve replaced
    - Piping segments will be upgraded in 2021 turnaround
    - Added further safeguards to our preventative maintenance and inspection programs
  - **Aug 13: Plant 1 boiler trips**
    - Extensive troubleshooting resulted in the discovery of excessive voltage drop on the control power feed
    - Reduced load on the control power feed and installed segregated additional control power feed
    - Installed diagnostic transmitter for on-going monitoring

# Community air monitoring

- Suncor personnel use a calibrated Industrial Scientific MX6 iBrid 6gas monitor capable of detecting Oxygen (O<sub>2</sub>), Carbon Monoxide (CO), Hydrogen Sulfide (H<sub>2</sub>S), Sulfur Dioxide, Flammable/Combustible Vapors (LEL), and Volatile Organic Compounds (VOCs).
  - Monitoring is based on wind speed and direction
  - Conducted by driving through community and stopping to take readings/assess conditions
  - Priority given to schools, parks, medical buildings, event centers
- Data is compared to national standards from:
  - Occupational Safety & Health Administration (OSHA)
  - American Industrial Hygiene Association (AIHA)
  - American Conference of Government Industrial Hygienists (ACGIH)
- Suncor also monitors the CDPHE community air monitoring station results that are open to all at <https://www.colorado.gov/airquality/report.aspx>
- If air monitoring data exceeds applicable standards, Suncor will raise EOC and coordinate with Fire and Police



# Air monitoring standards and thresholds

| Material                                                    | OSHA PEL | ACGIH TLV | AIHA ERPG-1 | Suncor Action Limits                                           |
|-------------------------------------------------------------|----------|-----------|-------------|----------------------------------------------------------------|
| Hydrogen Sulfide (H <sub>2</sub> S)                         | 20 ppm   | 1 ppm     | 0.1 ppm     | Any detectable odor or sustained reading of 0.1 ppm or greater |
| Sulfur Dioxide (SO <sub>2</sub> )                           | 5 ppm    | 2 ppm     | 0.3 ppm     | Any detectable odor or sustained reading of 0.3 ppm or greater |
| Photoionization Detector (PID) – detects hydrocarbon vapors | NE       | NE        | NE          | Sustained reading of 5 ppm or greater                          |
| Carbon Monoxide (CO)                                        | 50 ppm   | 25 ppm    | 200 ppm     | Sustained reading of 25 ppm or greater                         |
| Benzene                                                     | 1 ppm    | 0.5 ppm   | 50 ppm      | Sustained reading of 0.5 ppm or greater                        |

NE = Not Established

- OSHA PEL (Occupational Safety and Health Administration Permissible Exposure Limit): An OSHA PEL is the maximum time weighted average (TWA) concentration an employee may be exposed to in an 8 hour work shift, for a 40-hour work week.
- ACGIH TLV (American Conference of Government Industrial Hygienists Threshold Limit Value): Similar to an OSHA PEL, this is the maximum time weighted average (TWA) concentration that the ACGIH recommends a worker be exposed to when working 8 hours per day and for a 40-hour work week.
- AIHA ERPG-1 (American Industrial Hygiene Association Emergency Response Planning Guidelines-1): The maximum airborne concentration below which nearly all individuals could be exposed for up to 1 hour without experiencing more than mild, transient adverse health effects or without perceiving a clearly defined objectionable odor.

## Post 8/13/20 Event Suncor Community Monitoring Data (sample)

| Date     | Time        | Equip. Serial # | Location                                  | SO2 (ppm) | H2S (ppm) | CO (ppm) | PID / BZ (ppm) | Description of Odor (if applicable) | Comments                                                                     |
|----------|-------------|-----------------|-------------------------------------------|-----------|-----------|----------|----------------|-------------------------------------|------------------------------------------------------------------------------|
| 8/13/20  | 3:38:00 PM  | 11035BB-001     | 5950 York St                              | 0.0       | -2.3      | -15.0    | 0.0            | None                                | Initial zero of monitor                                                      |
| 8/13/20] | 3:39:00 PM  | 11035BB-001     | Zero'd Monitor                            |           |           |          |                |                                     |                                                                              |
| 8/13/20] | 3:41:00 PM  | 11035BB-001     | 6555 York St                              | 0.0       | 0.0       | 0.0      | 0.0            | None                                |                                                                              |
| 8/13/20] | 3:45:00 PM  | 11035BB-001     | 74th & Platte River                       | 0.0       | 0.0       | 0.0      | 0.0            | None                                |                                                                              |
| 8/13/20] | 3:50:00 PM  | 11035BB-001     | 6290 Colorado Blvd                        | 0.0       | 0.5       | -0.5     | 0.0            | None                                |                                                                              |
| 8/13/20] | 3:51:00 PM  | 11035BB-001     | Zero'd Monitor                            |           |           |          |                |                                     | Monitor (Serial # 11035BB-001) was not responding correctly and was drifting |
| 8/13/20] | 3:55:00 PM  | 11035BB-001     | RBC Parking Lot                           | 0.0       | 0.5       | 0.0      | 0.0            | None                                |                                                                              |
| 8/13/20] | 3:57:00 PM  | 11035BB-001     | Zero'd Monitor                            |           |           |          |                |                                     |                                                                              |
| 8/13/20] | 4:21:00 PM  | 1306406-001     | Changed Monitor                           |           |           |          |                |                                     |                                                                              |
| 8/13/20] | 4:24:00 PM  | 1306406-001     | 5950 York St                              | 0.0       | 0.0       | 0.0      | 0.0            | None                                |                                                                              |
| 8/13/20] | 4:27:00 PM  | 1306406-001     | 6555 York St                              | 0.0       | 0.0       | 0.0      | 0.0            | None                                |                                                                              |
| 8/13/20] | 4:31:00 PM  | 1306406-001     | 74th & Platte River                       | 0.0       | 0.0       | 0.0      | 0.0            | None                                |                                                                              |
| 8/13/20] | 4:36:00 PM  | 1306406-001     | 6290 Colorado Blvd                        | 0.0       | 0.0       | 0.0      | -0.3           | None                                |                                                                              |
| 8/13/20] | 4:42:00 PM  | 1306406-001     | RBC Parking Lot                           | 0.0       | 0.0       | 0.0      | 0.0            | None                                |                                                                              |
| 8/14/20  | 12:06:00 AM | 0803038-002     | RBC Parking Lot                           | 0.0       | 0.0       | 0.0      | 0.0            | None                                |                                                                              |
| 8/14/20  | 12:13:00 AM | 0803038-002     | Visitors Center                           | 0.0       | 0.0       | 0.0      | 0.0            | None                                |                                                                              |
| 8/14/20  | 12:17:00 AM | 0803038-002     | 3975 Sand Creek                           | 0.0       | 0.0       | 0.0      | 0.0            | None                                |                                                                              |
| 8/14/20  | 12:26:00 AM | 0803038-002     | Walmart @ Vaquez & 60th                   | 0.0       | 0.0       | 0.0      | 0.0            | None                                |                                                                              |
| 8/14/20  | 12:34:00 AM | 0803038-002     | 60th & Brighton                           | 0.0       | 0.0       | 0.0      | 0.0            | None                                |                                                                              |
| 8/14/20  | 1:14:00 AM  | 0803038-002     | Adams Heights Park                        | 0.0       | 0.0       | 0.0      | 0.0            | None                                |                                                                              |
| 8/14/20  | 1:18:00 AM  | 0803038-002     | South Adams Fire Station @ US-85 & Dexter | 0.0       | 0.0       | 0.0      | 0.0            | None                                |                                                                              |
| 8/14/20  | 1:23:00 AM  | 0803038-002     | 74th & Vaquez                             | 0.0       | 0.0       | 0.0      | 0.0            | None                                |                                                                              |
| 8/14/20  | 1:28:00 AM  | 0803038-002     | 72nd & Ivy                                | 0.0       | 0.0       | 0.0      | 0.0            | None                                |                                                                              |
| 8/14/20  | 1:33:00 AM  | 0803038-002     | 73rd & Hwy 2                              | 0.0       | 0.0       | 0.0      | 0.0            | None                                |                                                                              |
| 8/14/20  | 1:40:00 AM  | 0803038-002     | Adams County Fire Station                 | 0.0       | 0.0       | 0.0      | 0.0            | None                                |                                                                              |
| 8/14/20  | 3:07:00 AM  | 0803038-002     | Hwy 85 & 69th                             | 0.0       | 0.0       | 0.0      | 0.0            | None                                |                                                                              |
| 8/14/20  | 3:11:00 AM  | 0803038-002     | 77th & Brighton                           | 0.0       | 0.0       | 0.0      | 0.0            | None                                |                                                                              |
| 8/14/20  | 3:14:00 AM  | 0803038-002     | 77th & Dahlia                             | 0.0       | 0.0       | 0.0      | 0.0            | None                                |                                                                              |
| 8/14/20  | 3:16:00 AM  | 0803038-002     | 74th & Carnation                          | 0.0       | 0.0       | 0.0      | 0.0            | None                                |                                                                              |
| 8/14/20  | 3:19:00 AM  | 0803038-002     | 73rd & Birch                              | 0.0       | 0.0       | 0.0      | 0.0            | None                                |                                                                              |
| 8/14/20  | 3:21:00 AM  | 0803038-002     | 72nd & Birch                              | 0.0       | 0.0       | 0.0      | 0.0            | None                                |                                                                              |
| 8/14/20  | 3:25:00 AM  | 0803038-002     | 72nd & Colorado                           | 0.0       | 0.0       | 0.0      | 0.0            | None                                |                                                                              |
| 8/14/20  | 3:27:00 AM  | 0803038-002     | 70th & Birch                              | 0.0       | 0.0       | 0.0      | 0.0            | None                                |                                                                              |

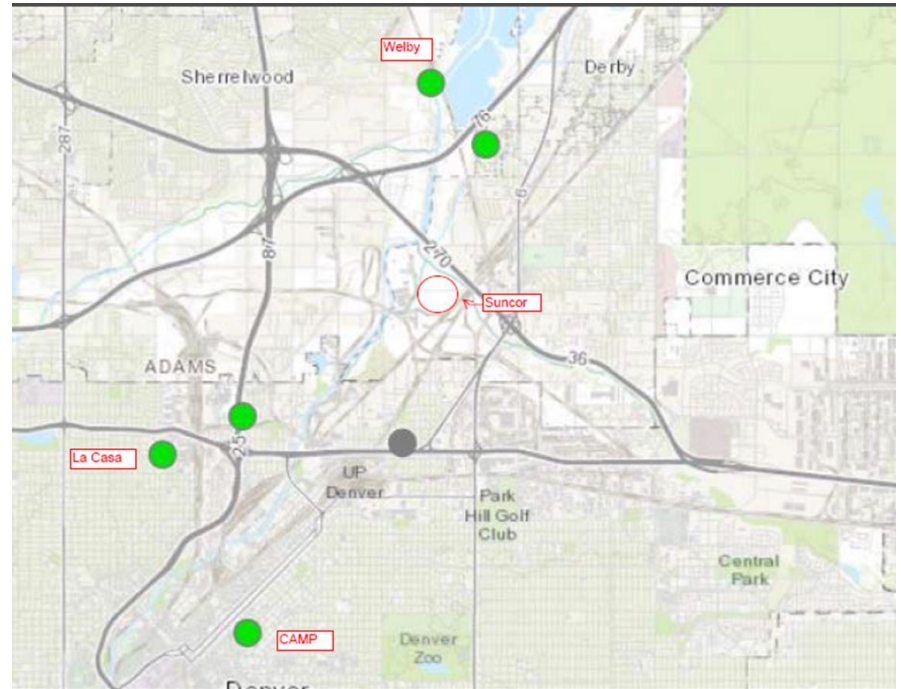


# 8/13/20 Event CDPHE Community Monitoring Data

## Data from CDPHE website

| Hour     | CAMP      |          |              | LA CASA   |          |              | WELBY     |          |              |
|----------|-----------|----------|--------------|-----------|----------|--------------|-----------|----------|--------------|
|          | SO2 (ppb) | CO (ppm) | PM10 (µg/m3) | SO2 (ppb) | CO (ppm) | PM10 (µg/m3) | SO2 (ppb) | CO (ppm) | PM10 (µg/m3) |
| 12:00 PM | 0         | 0.2      | 46           | 0         | 0.1      | 22           | 0         | 0.1      | 11           |
| 1:00 PM  | 0         | 0.2      | 33           | 0         | 0.1      | 19           | 0         | 0.1      | 10           |
| 2:00 PM  | 0         | 0.2      | 31           | 0         | 0.1      | 17           | 0         | 0.1      | 15           |
| 3:00 PM  | 0         | 0.2      | 23           | 0         | 0.1      | 19           | 0         | 0.1      | 13           |
| 4:00 PM  | 0         | 0.1      | 10           |           | 0.1      | 19           | 0         | 0.1      | 23           |
| 5:00 PM  | 0         | 0.1      | 10           | 0         | 0.1      | 21           | 0         | 0.2      | 26           |
| 6:00 PM  | 0         | 0.2      | 13           | 0         | 0.1      | 24           | 0         | 0.1      | 25           |
| 7:00 PM  | 0         | 0.1      | 16           | 0         |          | 35           | 0         | 0.1      | 27           |
| 8:00 PM  | 0         | 0.1      | 13           | 0         | 0.2      | 44           | 0         | 0.1      | 21           |
| 9:00 PM  | 0         | 0.1      | 14           | 0         | 0.2      | 52           | 0         | 0.1      | 24           |
| 10:00 PM | 0         | 0.1      | 16           | 0         | 0.2      | 52           | 0         | 0.1      | 24           |
| 11:00 PM | 0         | 0.1      | 15           | 1         | 0.2      | 46           | 0         | 0.1      | 36           |
| 12:00 AM | 0         | 0.1      | 15           | 0         | 0.2      | 48           | 0         | 0.1      | 35           |
| 1:00 AM  | 0         | 0.2      | 13           |           | 0.2      | 37           | 0         | 0.1      | 18           |
| 2:00 AM  | 0         | 0.1      | 13           | 0         | 0.1      | 34           | 0         | 0.1      | 19           |
| 3:00 AM  | 0         | 0.1      | 13           | 0         | 0.1      | 23           | 0         | 0.1      | 25           |
| 4:00 AM  | 0         | 0.1      | 16           | 0         | 0.1      | 20           | 0         | 0.1      | 45           |
| 5:00 AM  | 0         | 0.2      | 17           | 0         | 0.2      | 21           | 0         | 0.1      | 35           |
| 6:00 AM  | 1         | 0.3      | 18           | 0         | 0.2      | 28           | 0         | 0.1      | 36           |
| 7:00 AM  | 0         | 0.2      | 23           | 1         | 0.2      | 23           | 2         | 0.1      | 38           |
| 8:00 AM  | 0         |          | 31           | 1         | 0.1      | 22           | 1         | 0.1      | 41           |
| 9:00 AM  | 0         | 0.3      | 38           | 0         | 0.1      | 24           | 2         | 0.1      | 25           |
| 10:00 AM | 0         | 0.2      | 38           | 0         | 0.1      | 22           | 1         | 0.1      | 28           |
| 11:00 AM | 0         | 0.3      | 54           | 0         | 0.1      | 21           | 0         | 0.1      | 14           |

## CDPHE Air Monitoring Station Locations



CDPHE community air monitoring station data is available at [www.colorado.gov/airquality/report.aspx](http://www.colorado.gov/airquality/report.aspx)