



GOLD BAR

Ambient Air Quality Monitoring Data

MAY 2023

1. INTRODUCTION

EPCOR is committed to ongoing investments in odour mitigation and reduction at the Gold Bar Waste Water Treatment Plant (GBWWTP). We recently installed an ambient air quality monitoring station (AAQMS) near the GBWWTP, on Gold Bar Park Road. The new Gold Bar Park (GBP) station continuously monitors ambient air quality. The data collected is used to make changes to further reduce odours and improve air quality at the GBWWTP. This data will be available publicly through EPCOR's website each month and the data is submitted monthly to Alberta Environment and Protected Areas (AEPA) to comply with our operating approval.

In July and August 2022, the AAQMS started recording data and recorded exceedances of the 1-hour and 24-hour Alberta Ambient Air Quality Objectives (AAAQOs). The air quality monitoring method for the AAQMS is different from the current fence line monitoring and the AAQMS is closer to the plant than other stations in the area.

Change in Monitoring Method

The new AAQMS continuously monitors ambient concentrations of Hydrogen Sulfide (H₂S), Nitrogen Oxides (NO₂) and Sulfur Dioxide (SO₂) and other factors, like wind speed/direction and temperature. The existing eight locations for H₂S monitoring along the Gold Bar WWTP fence line are not continuous measurements and only represent the data at a specific point in time, once per day, making it difficult to compare the results with data from the new AAQMS.

Continuous monitoring takes measurements in real-time, allowing EPCOR to respond to possible issues to minimize impacts to the community.

Proximity to Gold Bar WWTP

Operations at the Gold Bar WWTP operations have not fundamentally changed, and we are continue to implement improvements to better mitigate and manage odours. However, the new AAQMS may sometimes measure higher concentrations of air substances than the Beverly and Gold Bar stations because it is closer to the Gold Bar WWTP. Measurements from the Gold Bar station and the Beverly Station have remained similar to previous months, as shown in the results below. These two stations are monitored by the Strathcona Industrial Association.

Health and Safety

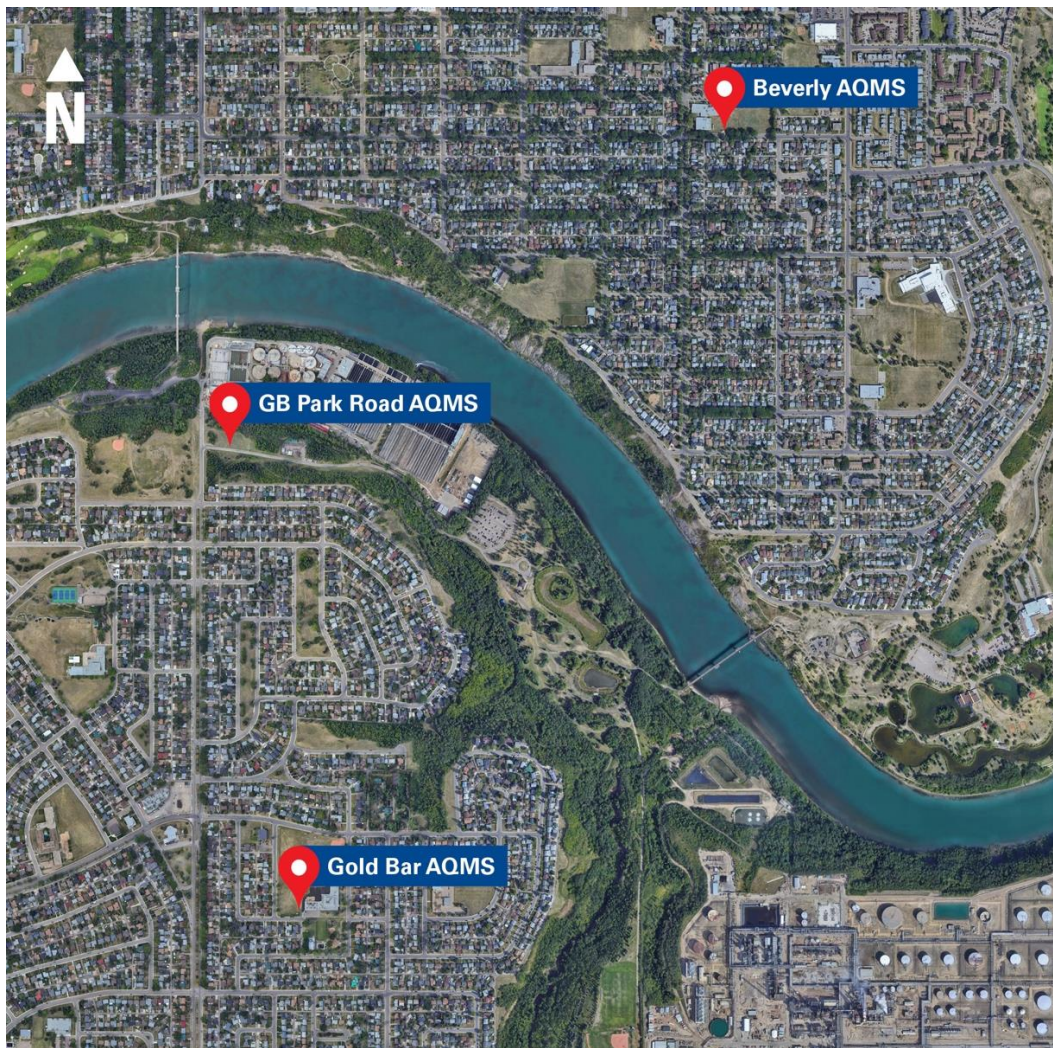
The 24-hour and 1-hour AAAQOs for H₂S are 3 parts per billion (ppb) and 10 ppb, respectively. The AAAQOs are developed to protect Alberta's air quality and are set at levels that evaluate facility performance and the adequacy of facility design. An exceedance of the AAAQOs might initiate a monitoring, reporting, or management action.

Humans will detect an odour from H₂S (rotten egg smell) around six to 10 parts per billion (ppb). The Alberta Occupational Exposure Limit for H₂S states that human health begins to be affected if exposed to concentrations higher than 10,000 ppb for eight hours. The levels currently being recorded at the AAQMS are substantially lower than this.

2. AMBIENT AIR QUALITY MONITORING NETWORK

There is a comprehensive network of about 110 ambient air quality monitoring stations throughout Alberta, operated by the provincial and federal governments, airsheds, and industry. The stations that provide data to the Gold Bar WWTP include the Gold Bar Park (GBP) station, the Gold Bar station and the Beverly station (See Figure 1 for a map of locations).

Figure 1: Air Quality Monitoring Stations (AQMS)



3. AMBIENT AIR QUALITY OBJECTIVES

Alberta Ambient Air Quality Objectives (AAAQOs) are pre-established concentrations of certain substances that pose a potential risk to the environment or human health. At the GBP station, concentrations of H₂S, NO₂, SO₂ are monitored and compared with the AAAQOs. If the AAAQOs are exceeded, this is reported to the Government of Alberta.

Air quality objectives are generally established for one-hour, 24-hour, and annual averaging periods. The air quality monitoring station takes readings continuously and these readings are averaged to give hourly and 24-hour air quality information. All averages are arithmetic means.

Table 1: Alberta Ambient Air Quality Objectives for H₂S, SO₂, and NO₂

Substance	H ₂ S		SO ₂		NO ₂
	1-hour	24-hour	1-hour	24-hour	1-hour
AAAQO	10 ppb	3 ppb	172 ppb	48 ppb	159 ppb

* NO₂ does not have a 24-hour AAAQO

While there are occasional times that H₂S levels at the Gold Bar WWTP exceed Alberta Ambient Air Quality Objectives, (such as during equipment maintenance), our H₂S levels are much lower than those that can bring health concerns outlined in OH&S legislation. Please visit our [website](#) to understand more about different levels of H₂S.

4. RESULTS

4.1. Hydrogen Sulfide

Table 1 shows a summary of the data for H₂S for May 2023. Figure 2 shows the results for May 2023 for 1-hour concentrations of H₂S for the stations at GBP, Gold Bar, and Beverly. Figure 3 shows the results for May 2023 24-hour concentrations of H₂S.

In May, there were ten exceedances of the 1-hour AAAQO and two exceedances of the 24-hour AAAQO at the GBP station. These have been reported to Alberta Environment and Protected Areas. There were no exceedances recorded at the Gold Bar station (1.19 km south) or at the Beverly station (1.37 km northeast). It should be noted that we expect seasonal variations in H₂S levels. The dispersion of H₂S molecules can be influenced by weather, including wind and air currents.

Table 2: May 2023 Monthly Ambient Air Quality Summary (H₂S, ppb)

Station	Monthly Average	# Exceedance		Maximum Recorded Values			
				1- Hour		24- Hour	
		1- Hour	24- Hour	Concentration	Day & Time	Concentration	Day
Beverly AQMS	0.5	0	0	6.5	29-May-2023 05:00	1.0	29-May-23
Gold Bar AQMS	0.4	0	0	4.1	11-May-2023 06:00	1.0	11-May-23
GB Park Road AQMS	1.2	10	2	18.9	20-May-2023 00:00	4.0	30-May-23

Figure 2: 1-Hour H₂S Concentrations vs. Alberta Ambient Air Quality Objectives (AAAQO 10)

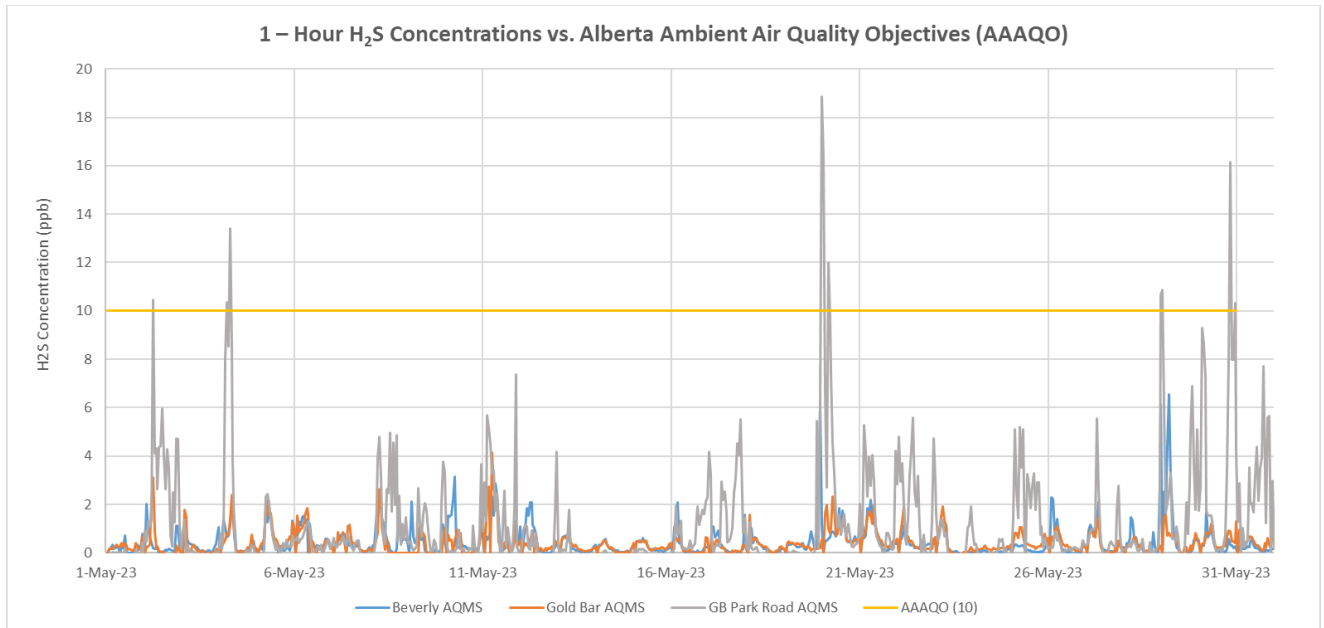
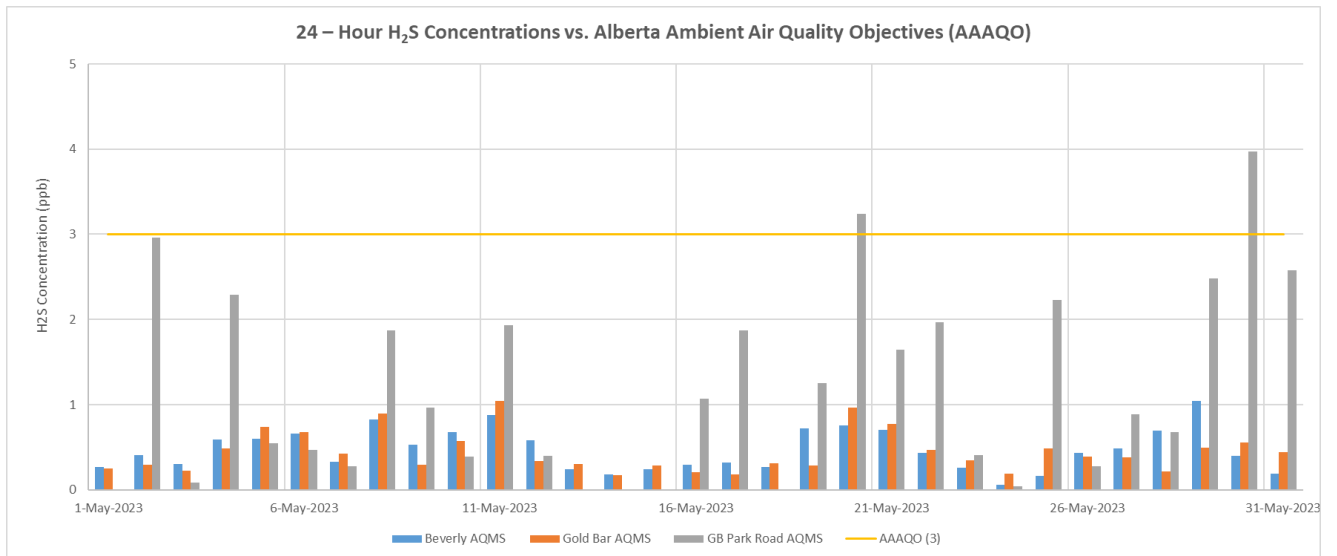


Figure 3: 24-Hour H₂S Concentrations vs. Alberta Ambient Air Quality Objectives (AAAQO 3)



4.2. Sulfur Dioxide

Figure 4 shows the results for May 2023 for 1-hour concentrations of SO₂ for the stations at GBP, Gold Bar, and Beverly. Figure 5 shows the results for May 2023 24-hour concentrations of SO₂.

Figure 4: 1-Hour SO₂ Concentrations vs. Alberta Ambient Air Quality Objectives (AAAQO 172)

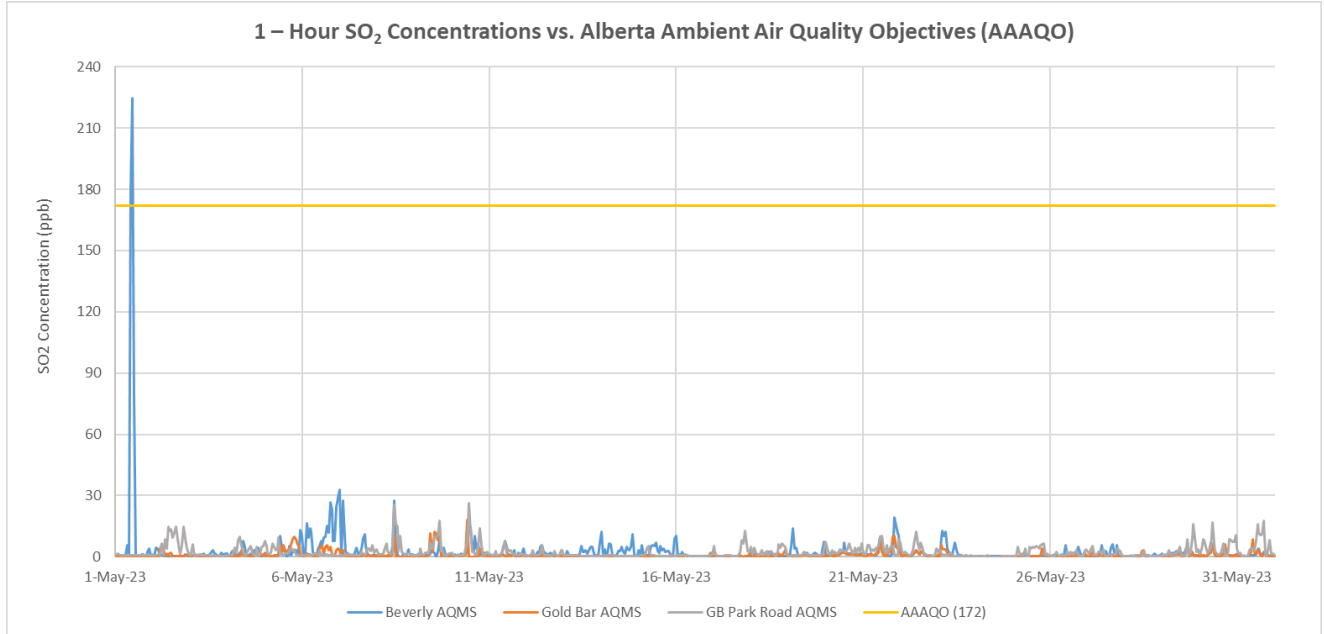
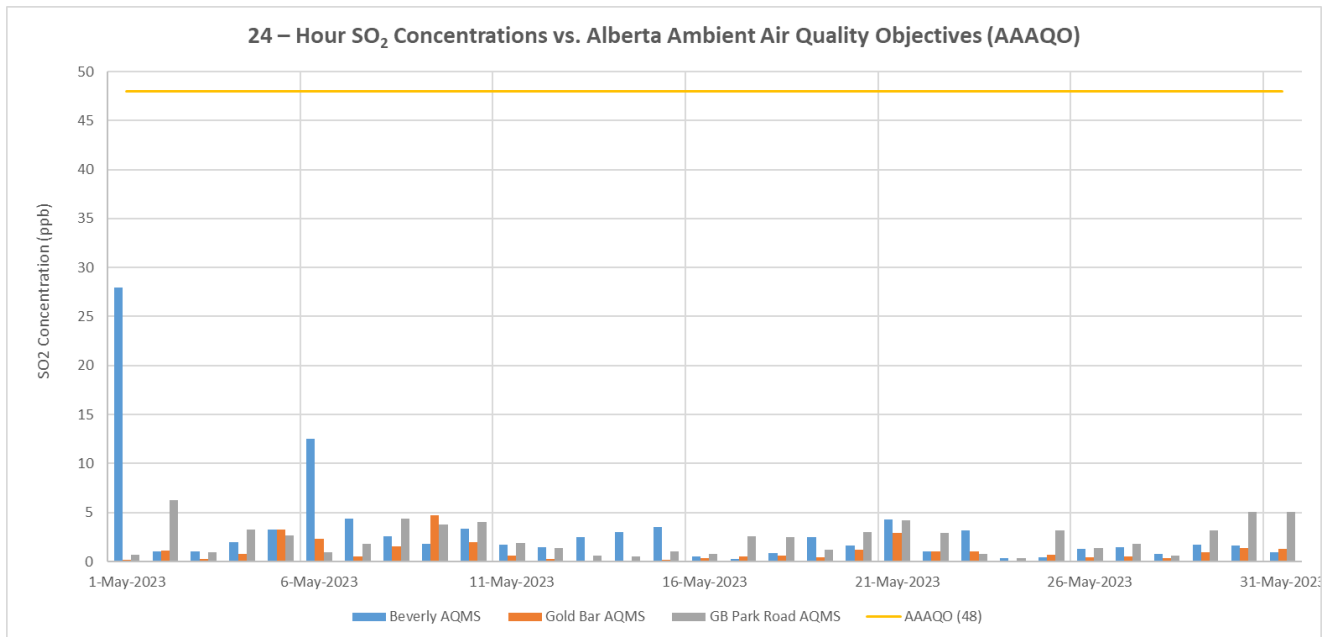


Figure 5: 24-Hour SO₂ Concentrations vs. Alberta Ambient Air Quality Objectives (AAAQO 48)

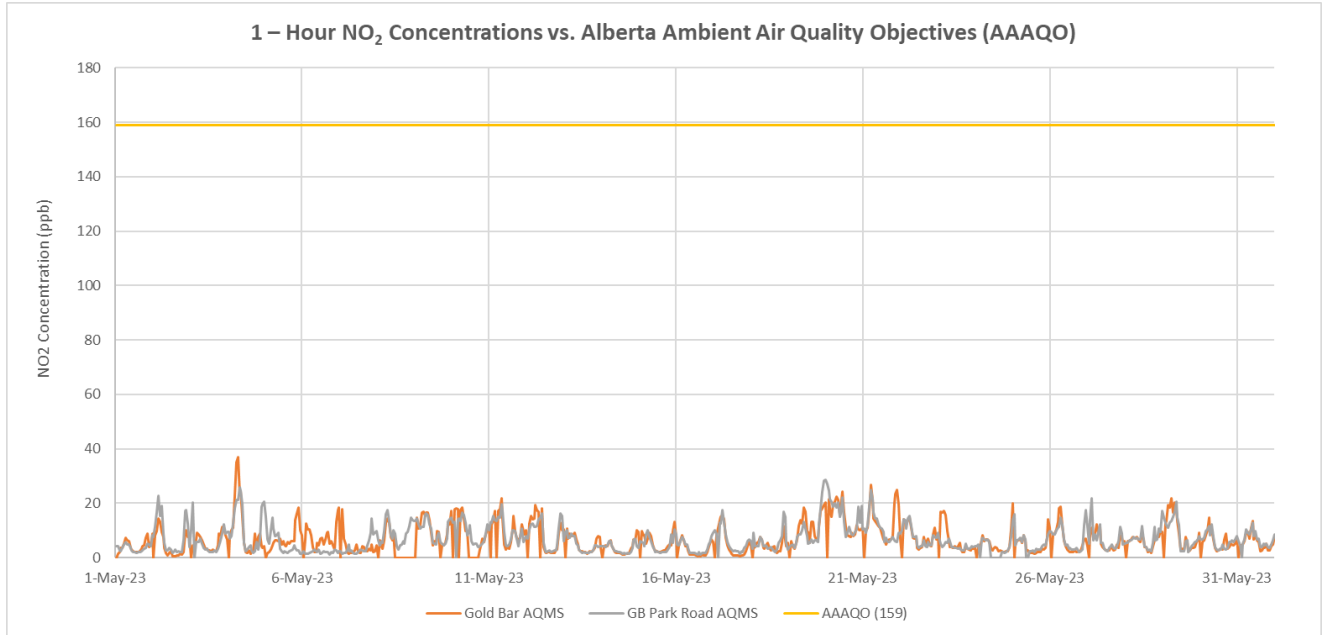


4.3. Nitrogen Oxides

Figure 6 shows the results for May 2023 for 1-hour concentrations of NO₂ for the stations at GBP and Gold Bar. The Beverly Station does not measure NO₂.

There is no 24-hour AAAQO for NO₂, only a 1-hour objective and an annual objective. The annual objective for NO₂ will be reported on when enough data has been collected.

Figure 6: 1-Hour NO₂ Concentrations vs. Alberta Ambient Air Quality Objectives (AAAQO 159)



Note: to view all monthly reports, as well as the fence line monitoring results, please visit www.epcor.com/goldbardata



MORE INFORMATION

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