Hydrogen (H_2) Hazard Assessment

Introduction

This assessment examines hydrogen (H_2) concentrations at various depths within Jetstream #1 to determine whether H_2 should be incorporated into the Gas Hazard Management Plan. Measured concentrations range from 19.83 PPM to 1,067.81 PPM, all of which remain well below established flammability and oxygen displacement thresholds. While no immediate hazard is present, ongoing monitoring is recommended to identify potential fluctuations.

Analysis of Hydrogen Levels

Hydrogen concentrations measured range from 19.83 PPM to 1,067.81 PPM. These levels exhibit localized variations but remain significantly below recognized safety thresholds for flammability and oxygen displacement. The highest recorded concentration (1,067.81 PPM at 580 feet) poses no immediate safety risk.

Based on the observed data, H_2 does not currently present a significant hazard at this site; however, periodic assessments should continue to ensure safe conditions.

Flammability & Oxygen Displacement Risks

Flammability Threshold

- The Lower Explosive Limit (LEL) of H_2 is 40,000 PPM (4%).
- OSHA requires action at 4,000 PPM (10% of LEL).
- The highest recorded concentration (1,067.81 PPM at 580') is only 2.67% of the OSHA action level, indicating negligible flammability risk.

Oxygen Displacement Risk

- Oxygen deficiency concerns begin at 50,000+ PPM (5%).
- All recorded H_2 values remain well below this threshold, eliminating any immediate asphyxiation risk.

No Indication of Dangerous Accumulation

- Hydrogen is lighter than air and disperses easily.
- Unless accumulation occurs in confined spaces with poor ventilation, the risk remains minimal.

Triggers for Updating the Gas Hazard Management Plan

The Gas Hazard Management SOP should be updated if any of the following conditions occur:

- H_2 concentrations exceed 4,000 PPM (10% of LEL), requiring flammability monitoring.
- H_2 reaches or exceeds 50,000 PPM (5%), posing an oxygen displacement risk.
- Significant H_2 accumulation occurs in confined spaces, requiring enhanced ventilation or monitoring.

Conclusion & Recommendations

At present, hydrogen levels remain too low to justify inclusion in the Gas Hazard Management SOP. However, periodic monitoring should continue to detect any potential rising trends that may warrant future action.