**H2S Release Rate Presubmission Checklist**

Part 1: Geological Components

* Geological Well Prognosis. The well prognosis must identify:
  + all formations or zones penetrated by the wellbore with expected MD and TVD depths,
  + approximate well KB and ground elevation
  + where applicable, each zone’s interpreted fluid potential (oil, gas, water, tight)
  + where applicable, the zones potential to contain H2S
  + production target zone(s) identified (primary and secondary)
  + terminating formation
* Geological discussion. The geologic discussion supports the interpretations indicated in the geologic prognosis. The geological discussion contains, where appropriate, maps, cross-sections, diagrams, core descriptions, and other geologic evidence to support the interpretation.
  + For each formation or zone penetrated by the wellbore, the geological discussion must contain:
    - Interpretation with supporting evidence of the fluid potential expected (oil, gas, water, tight).
    - For zones expected to flow hydrocarbons and identified as H2S-bearing, a geologic discussion to guide the engineer in analogue selection appropriate to the release rate calculation is required. The discussion should include a description of the zone’s potential, geologic setting, respective trends, analogous areas and/or tests by which test selection is delineated.
    - For zones interpreted to not bear hydrocarbons, a brief discussion of the zone’s potential should be documented as tight, wet, eroded/not present, poorly developed, indicating supporting geologic analogies and/or data.
* Geological Mapping
  + The applicant must submit geological maps for all formations that it has or will identify on Schedule 4: Well Purpose as its primary and secondary zones that may contain H2S gas.
  + Mapping to support zone interpretations in the geological discussion can include, but are not limited to:
    - isopach
    - net pay
    - structure
    - depositional environment
    - production and test data distribution
* Other evidence that may be used to support zone interpretations can include, but are not limited to:
  + Log cross-sections
  + Seismic sections including:
    - models and synthetics
    - isochron maps
  + Core and/or cuttings analyses

Part 2: Tabulated Data

* The applicant must provide the results of H2S concentration and AOF rate reviews in a tabular format.
* For each formation or zone, the applicant must select a minimum of five H2S gas analyses and five AOF data points that are representative of that zone. Data points are representative if they are from a geologically analogous area or pool and are not discounted for technical reasons.
* The applicant must use the highest selected H2S concentration and the highest selected AOF rate in the release rate calculation for each zone. These H2S and AOF tests should be clearly indicated in the tabulated data.
* Copies of H2S (fluid analysis) and AOF tests used in calculations.

Part 3: Engineering Components

* Wellbore diagram indicating planned wellbore trajectory, interval depths of intermediate casing, kick-off point for deviated/horizontal wells, heel and toe measured depths of horizontal section, number of fracture stimulation stages, and production tubing details.
* Engineering Discussion. For each zone capable of flowing H2S, the engineering discussion must include:
  + data that was excluded from search results based on geological interpretations
  + identify any higher H2S test data that was not used in the calculations and provide reasons for discounting this data
  + identify any higher AOF test data that was not used in the calculations and provide reasons for discounting this data
* For each zone capable of flowing H2S, indicate the selected analogous H2S concentration used in the release rate calculation (reference the well UWI, test value, and distance from proposed well location)
* For each zone capable of flowing H2S, indicate the selected analogous AOF test rate used in the release rate calculation (reference the well UWI, test type (AOF/DST/IPR), test rate, and distance from proposed well location).
  + If an AOF rate was used, indicated any adjustments made to the AOF rate including pressure, stimulation, horizontal length and fracture stage corrections.
  + If a DST rate was used, provide
    - an explanation as to why a DST rate was used, and
    - the derived pseudo AOF rate- indicate the static reservoir pressure, flowing bottom hole pressure and maximum gas rate used
  + If an inflow performance relationship (IPR) rate was used, provide
    - an explanation as to why an IPR rate was used, and
    - the derived pseudo AOF rate- indicate the month and year of IPR production data used, the maximum oil rate and GOR associated with this time frame, initial reservoir pressure, the percentage of drawdown and estimated flowing bottom hole pressure used
* For each zone capable of flowing H2S, provide the results of the release rate calculation. Indicate any additional calculation adjustments or corrections made.
* The Engineering discussion and the geological discussion should be consistent in the zones identified for inclusion in the release rate calculation.
* For the proposed well, the applicant must determine at least three H2S release rates:
  + drilling release rate

For wells with planned intermediate casing, more than one drilling release rate must be calculated. Each drilling release rate must account for all uncased formations at time of drilling.

* + completion/servicing release rate (target formation(s) only)
  + suspended/producing release rate (target formation(s) only)

For completion/servicing and suspended/producing release rates, documentation must include all the factors that were used in the calculation (eg. tubing size, casing size) as applicable.

* Completed schedule 4.3.
  + Enter calculated release rates on schedule 4.3. For wells with planned intermediate casing, enter the highest calculated drilling release rate scenario.
  + Ensure schedule 4.3 is consistent with geology and engineering discussions.