**Comparing Various Process Simulator Model Output (Flash Gas Composition) from Oil-Producing Wells in the Uinta Basin**

*Lexie Wilson (UDAQ); Trang Tran (USU); Cindy Beeler (EPA R8); Michael Pearson (AST); Seth Lyman (USU)*

Pressurized liquids and raw gas samples were collected from 78 wells in the Uinta Basin in 2018 and 2019 as part of the Uinta Basin Composition Study. Flash gas composition was initially simulated using a process simulator model determined by an equation of state (EOS/PSM). A subset of the 78 wells were re-sampled and the pressurized liquids were physically flashed to determine flash gas composition. This study compares the results of the physically flashed gas composition to flash gas composition as modeled by several different EOS/PSM. Several other model outputs are also compared, including VOC emissions from the flash gas in tons per year, Reid vapor pressure and API gravity of the sales oil, and the flash-gas-to-oil ratio (FGOR). The estimation of flash gas composition, FGOR, and API gravity of sales oil is a key exercise in characterizing air emissions from atmospheric tanks at upstream oil and gas facilities. This analysis is often a requirement for obtaining air permits from State, Federal, and Tribal air agencies. As such, this study explores the various methodologies used by industry and laboratories to obtain these emissions characteristics, with a goal to assist operators in obtaining high integrity data for their air permit applications and inventories. This is a first attempt to determine the responsiveness of several EOS/PSM to the Uinta Basin’s notoriously difficult-to-measure waxy crude.