

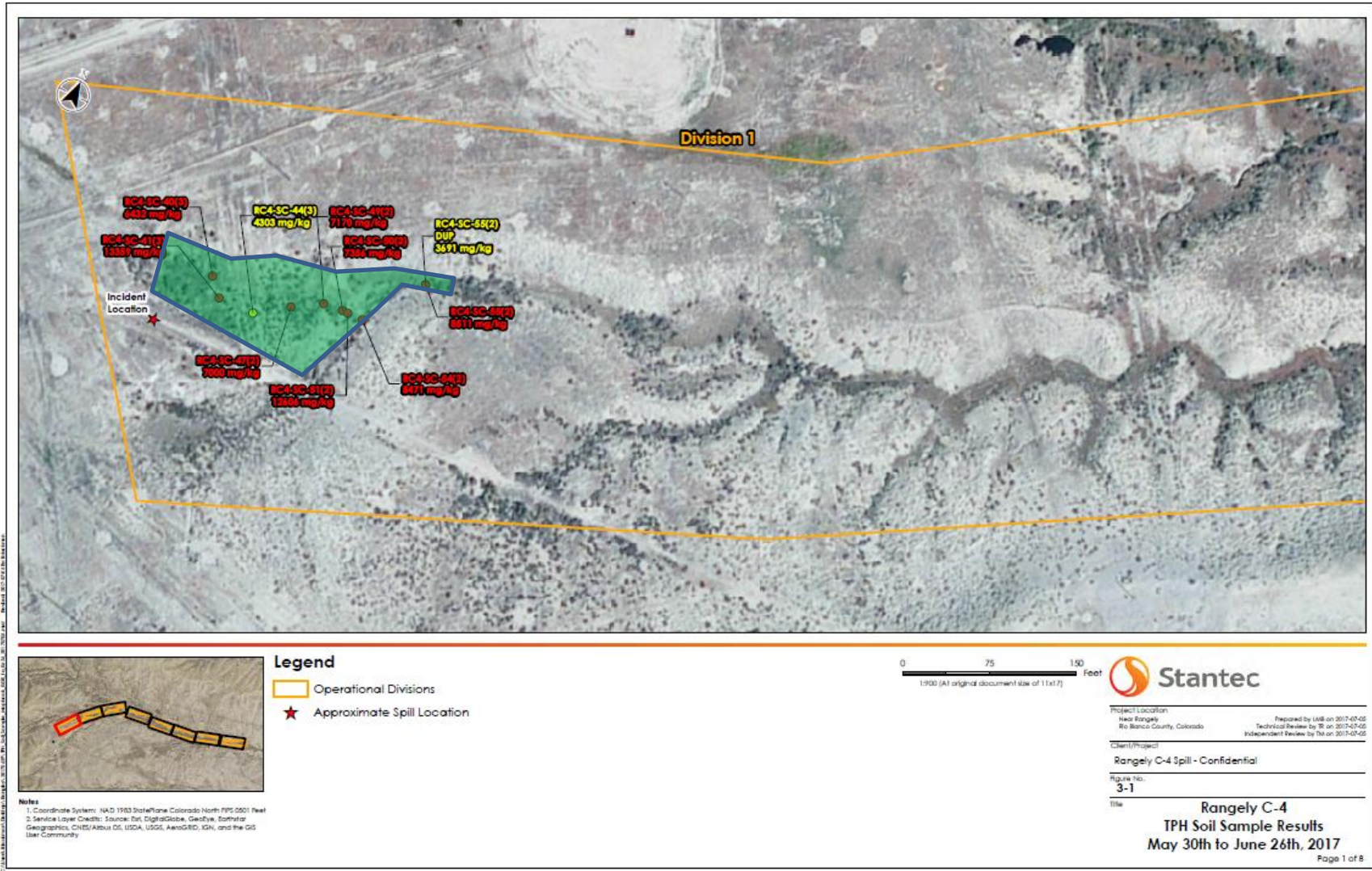
**Request to Amend Soils in Three Pilot Areas with Nitrogen to Enhance Biodegradation of Total Petroleum Hydrocarbons (TPH) at the Rangely C4 Incident Site**

**Submitted by**

**Chevron Pipe Line Company**

Chevron Pipe Line Company (CPL) is requesting approval from Colorado Oil and Gas Conservation Commission (COGCC) and Bureau of Land Management (BLM) to amend soil in three pilot locations with a granular nitrogen source (Urea-46; SDS attached to email request) to investigate if this addition can further enhance the biodegradation of total petroleum hydrocarbons (TPH) at the Rangely C4 incident site. Amendments of nitrogen to TPH impacted soils is a common practice used to enhance remediation and ensure the microorganisms have a sufficient source of nitrogen for the decomposition of organic materials such as TPH. This nitrogen amendment practice is used at Chevron North America Exploration and Production Company (CNAEP) Land Treatment Farm for this sole purpose. CPL is proposing that nitrogen concentrations in the soil be increased to a ratio of organic carbon (TPH in this case) to nitrogen as 100:7.5, C: N. This ratio is commonly cited by United State Environmental Protection Agency (USEPA) and numerous scientific researchers as a targeted C: N ratio which promotes TPH biodegradation rates along with soil aeration, which is currently being conducted through tilling bimonthly at the Rangely C4 incident site. The source of nitrogen that is being proposed is again consistent with the CNAEP land treatment farm as Urea-46. There is an extremely low likelihood that this addition could cause any negative, unattended consequences to the surrounding environment as the increase in soil nitrogen concentrations are minor (0.75 g as N/kg) and stormwater is managed on-site using the Division 1 catchment basin and the Division 5 Siphon V Dam. CPL will inspect the site pre- and post-nitrogen amendment to ensure adequate application results are achieved and monitor for any deviations which again are highly unlikely to occur. Below are two figures indicating the locations of the proposed nitrogen source treatment plots. CPL will additionally sample these treatment plots along with non-treatment areas to evaluate TPH degradation rates during the remediation period. TPH degradation results will be presented in monthly status reports following soil nitrogen amendments.

Figure 1. Proposed nitrogen soil amendment treatment pilot location in Division I (area illustrated by green shading).



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Figure 2. Proposed nitrogen soil amendment treatment pilot locations in Division III (areas illustrated by green shading).

