

**Delta Petroleum Corporation  
Pad 13A Description and Best Management  
Practices for Cutthroat Trout Habitat  
NENE Sect. 13 T9S R93W  
Mesa County, Colorado**

**Background**

Pad 13A is a planned multiple well expansion of an existing oil and gas well pad that has been in place since 1991 when the Buzzard Creek Unit #13-1 Well was drilled. The goal of the pad expansion is to minimize surface impact to the fullest extent possible by expanding an existing pad and using an existing access road, while also providing a suitable surface location for the planned wells to be able to reach their projected bottom hole targets through directional drilling practices. Figure #1 is an aerial photograph that shows the location of the existing pad with the pad expansion area shown in crosshatch. Delta Petroleum Corporation had previously obtained Colorado Oil and Gas Conservation Commission (COGCC) permits to drill for 26 wells on the pad expansion area in 2009. The 26 well permits to drill expire on February 9, 2010, so there is a need to re-apply for the permits.

During the last year, the COGCC rules were revised to include requirements in Restricted Surface Occupancy (RSO) areas. The area where the Pad 13A expansion is planned to occur is now partially overlaid by what has been mapped by the Colorado Division of Wildlife (CDOW) as an RSO area with respect to Cutthroat Trout habitat for both Buzzard Creek and an unnamed small intermittent tributary to Buzzard Creek. Figure #2 is an aerial photograph that shows the location of the existing pad with the pad expansion area shown in crosshatch and also overlaid by the mapped Cutthroat Trout RSO. Figures #3 and #4 show plat maps of the existing pad, the pad expansion area, the existing access road and the proposed access road for both before and after interim reclamation.

The surrounding area was examined to determine if there were any other suitable surface locations that would accommodate the planned bottom hole locations while minimizing surface impact. Possible alternative locations outside of the RSO to the north and east are precluded by a surface owner who is unwilling to allow the operation, and the locations would require a large amount of new surface disturbance for a new pad and access road. Possible locations outside of the RSO area to the south and east across Buzzard Creek would not allow some of the planned bottom hole locations to be reached due to the increased horizontal distance, and would require the construction of a new bridge across Buzzard Creek and a large amount of new surface disturbance for a new pad and access road. In addition, a fairly large cut on the steep hillside would very likely create visual impact issues.

The conclusion is that the use and expansion of the existing Pad 13A would cause the least amount of additional surface disturbance, would take advantage of existing infrastructure, and would be protective of cutthroat trout habitat with the use of appropriate best management practices. In addition, the surface owner has indicated a desire to expand the existing pad to minimize additional disturbance on their property.

#### **Pad 13A Proposed Best Management Practices to Protect Cutthroat Trout Habitat**

1. New surface disturbance will be minimized through the maximum use of an existing well pad and access road.
2. Any new surface disturbance will be in a direction away from the existing Buzzard Creek channel.
3. No stream disturbances will occur on this project, which will avoid impacts to spawning cutthroat trout.
4. No water suction hoses will be used to draw water from the Buzzard Creek and side tributary channels directly adjacent to the Pad 13A expansion project. Screens will be used on water suction hoses used on surface waters.
5. Requirements for site preparation and stabilization, interim reclamation, and final reclamation of the well site under the COGCC 1000 Series Reclamation Regulations will be complied with.
6. Best management practices will be implemented and maintained to control stormwater runoff in a manner that minimizes erosion, transport of sediment offsite, and site degradation in accordance with Colorado Department of Public Health and the Environment and COGCC requirements as detailed in the Stormwater Management Plan for the Vega Unit and Harrison Creek Area, Mesa County, Colorado. These measures may include, but are not limited to:
  - Stormwater diversion ditches up-gradient from the disturbed area to prevent stormwater entry into disturbed areas. Check dams, rock armoring, and erosion control fabric will be installed as needed in the ditches to prevent erosion.
  - Wattles will be installed down-gradient of all disturbed areas in accordance with manufacturer recommendations to prevent sediment migration towards waterways.
  - A berm will be installed around the perimeter of the pad location to prevent discharge of sediment or contaminants from the location.
  - The pad and access roads will be graveled as soon after construction as possible to prevent mud tracking and dust.

Sediment basins may be installed at strategic locations to retain sediment generated during ground disturbing activities.

Culverts of sufficient size to accommodate all anticipated stormwater flow will be installed at appropriate locations along the access road to facilitate proper drainage of undisturbed areas.

Rock armoring and/or wattles will be installed at and below outfalls to prevent erosion and sediment migration.

Erosion control blankets may be used to protect slopes while interim revegetation is instituted.

Stormwater control measures will be inspected and documented every 14 days and after storm events to ensure that proper maintenance occurs.

Figure 5 shows a plat map that shows the location of the stormwater management BMP's.

7. Apply certified weed-free mulch and crimp or tacyfy to remain in place to reclaim areas for seed preservation and moisture retention.
8. Utilize staked soil retention blankets for erosion control and reclamation of large surface areas with 3:1 or steeper slopes.
9. The access road and location will be sufficiently graveled to minimize the generation of fugitive dust and contribution of sediment to downstream areas. No other dust suppression activities will occur within 300 feet of the ordinary high water mark of Buzzard Creek or its tributaries.
10. Implement the "Noxious and Invasive Weed Management Plan for Oil and Gas Operators, Grand junction Field Office and Grand Valley Ranger District, March 2007" which has been approved by the Grand Junction Field office of the U.S. Bureau of Land Management and the Mesa County Pest and Weed Inspector.
11. Closed-loop or pitless drilling practices will be utilized.
12. Tanks and flowlines will be used instead of pits for flowback of well completion fluids.
13. Remote monitoring (i.e. SCADA) systems will be utilized.
14. Perform sampling and analysis to establish baseline water quality in Buzzard Creek both upstream and downstream of the Pad 13A area prior to commencing oil and gas operations. Perform follow up sampling and analysis to monitor water quality in Buzzard Creek once every six months while drilling and completion operations are being conducted and within six months after the drilling and completion operations are concluded. This applies to each period of drilling and completion operations if the drilling rig is removed and there is a break in the drilling operations.

The water quality analysis will include all major cations and anions, total dissolved solids, calcium, iron, potassium, magnesium, sodium, selenium, ammonia, nitrates and nitrites, hydrogen sulfide, dissolved methane, BTEX, oil and grease, field pH, specific conductance, and dissolved oxygen. The analysis will be provided to the Colorado Division of Wildlife within 30 days after the results are available.

15. Automated emergency response systems including high tank alarms and emergency shut down systems will be installed on the producing well facilities.
16. Emergency spill response equipment will be stored within a five mile radius so that it is available to expedite effective spill response.
17. Report any spills or releases of exploration and production waste that affect wildlife to the Colorado Division of Wildlife no later than 24 hours after discovery.