

This Change Sheet covers the revisions made on the Draft UST Closure Summary for Tipple Motors. This new text reflects changes in response to comments received during the public comment period and are to be inserted at the bottom of page 5 at the end of the section titled “**Objections to Case Closure and Response**”

**CHANGES TO THE DRAFT UST CLOSURE SUMMARY FOR TIPPLE MOTORS**

The County, commenting on the Draft Closure Summary, recommended revising the summary to include the following points:

1. Remediation did not occur to the extent practicable. The vacuum extraction system terminated operation in July 2008. The rate of recovery at the time of shut-down was high enough to justify continued operation. The extraction points installed inside the building were effective. Additional mass could have been removed effectively and there were other areas of high petroleum constituent concentrations in soil where extraction points could have been installed.
2. The trend line presented is inaccurate. Because significant mass removal occurred, it is inaccurate to place trendlines through plots of concentration verses time for the entire period of investigation. In order to estimate the rate of degradation of remaining mass, the data collected after shutdown is pertinent.
3. There is negligible influence from biodegradation at this site. The rate of degradation of the remaining mass is evaluated by results of water samples collected after shutdown of the remediation system. Based on the measured concentrations since shutdown and the long term trend, biodegradation has a negligible influence at this site.

Response:

1. Site remediation consisted of the excavation and disposal of 590 cubic yards of affected soil (1997), air sparge and soil vapor extraction (2005), and high vacuum dual-phase extraction (2007 and 2008) that recovered an estimated 3,172 pounds of gasoline hydrocarbons and 63,150 gallons of affected groundwater. Operation of the extraction system created a noise nuisance that was a factor considered for the shutdown of the system.

Some additional mass of gasoline could be recovered via additional corrective action although extraction techniques will not remove all of the residual gasoline in soil due to the fine-grained nature of the soil at the site. Concentrations of gasoline constituents in shallow site groundwater will continue to exceed water quality objectives for decades to hundreds of years unless complete over-excavation of the affected area is accomplished. Because the dissolved-phase plume is stable, natural attenuation will restore groundwater quality in decades to hundreds of years and human health and safety are not a significant risk. No practicable benefit, including benefit to beneficial uses of the groundwater will be served by further attempts to remove the remaining mass from the site’s fine-grained soils.

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2. The trend lines for the entire period of investigation show that there has been a net decrease in concentration and mass of petroleum constituents. These trend lines are not intended to be used to determine a precise rate of degradation of remaining mass.
  
3. The influence of biodegradation of gasoline constituents in site groundwater is significant. The effect of biodegradation cannot be readily judged by groundwater samples taken from areas where residual gasoline is present in fine-grained soil. The majority of the biodegradation occurs in the dissolved-phase plume down-gradient of the source area. The long-term stability of the plume is good evidence that biodegradation is a significant factor at the site