EPA Responses to Hatchco Comments
On the Proposed Plan
For Bountiful Woods/Cross PCE NPL Site
OU1 (Hatchco)

The Environmental Protection Agency (EPA) provides the following responses to W.S. Hatch Company (Hatchco) comments dated October 8, 2004. Please note EPA's responses are provided in *Italic* font.

Introduction to Comments

In order to put its comments in context, Hatchco provides this short introduction, summarizing several key facts that must be considered in the selection of any remedy for OU1.

- The discovery of contamination at the Hatchco property (the Site) in the mid-1990's prompted Hatchco to take multiple remedial actions, including the voluntary removal, treatment and disposal of contaminated soils. Because the excavated soils were associated with contaminant release points such as a former french drain, the soils removed by Hatchco contained relatively high contaminant concentrations as compared with contaminated soils remaining at the Site. In addition to source remediation, Hatchco voluntarily initiated active treatment of groundwater in 1998.

  Response - EPA acknowledges and has taken into consideration the cleanup actions Hatchco applied to its property. However, consistent with the NCP Section 300.435, ". . .RD/RA activities shall be in conformance with the remedy selected and set forth in the ROD or other decision document for the site. The Proposed Plan presents the first remedial action that will be undertaken at the Bountiful/Woods Cross/5th South PCE Plume Site (OU1) *under a ROD.*

- A Remedial Investigation (RI) of OU1 completed in 2003 identified a groundwater contaminant plume consisting of dissolved phase chlorinated hydrocarbons extending from the Hatchco property to the west-northwest. Importantly, this plume commingles with two other groundwater contaminant plumes (petroleum fuel and chlorinated hydrocarbon) originating from as yet unidentified sources remote from the Hatchco property.

  Response - EPA agrees that the Hatchco groundwater plume commingles with a groundwater contaminant plume to the northwest (mainly MTBE); however, EPA has not identified a secondary source west-northwest of the Hatchco property. Results of the remedial investigation for OU2 are inconclusive. The location of suspected secondary source, if exists, remains uncertain.

- In addition to the source soils previously excavated by Hatchco at the Site, it is possible that some source material for the Hatchco plume remains, limited to an interval between one and three-feet thick occurring at a depth of approximately 20-feet over a 0.5-acre area located on the central portion of the Hatchco property. This inferred source area is characterized by contaminant concentrations well below the soil saturation limit (maximum TCE concentration of 91 milligrams per kilogram (mg/kg)) and the lack of observed dense non-aqueous phase liquid (DNAPL).

  Response – It is not only possible that some source remains at the site, it is evident. Soil contamination is supported not only by the analytical data but also by the boring logs showing petroleum odor throughout the borings from 11 feet down and by the free product observed at 20' bgs. As stated above, the maximum TCE concentration of 91 mg/kg is below the soil saturation limit, but the concentrations are high when compared to the Dilution Attenuation Factor(DAF) of 0.06 mg/L (US EPA, Soil Screening Guidance, 1996; DAF value for a 0.5-acre site.). EPA believes the contaminated site may continue to present a contamination source to groundwater.

- A Focused Feasibility Study (FFS) completed in July 2004 screened applicable remedial technologies and developed and evaluated remedial alternatives to address contaminated source soils and groundwater. Remedial alternatives to treat contaminated soils were assembled from technologies retained after the technology screening step and included excavation, capping and soil vapor extraction, all of which were retained for the detailed analysis stage of the FFS except for excavation. Groundwater alternatives in the FFS included monitored natural attenuation (MNA), enhanced in-situ biological treatment and groundwater extraction with various above-ground treatment schemes, all of which were retained for the detailed analysis stage of the FFS.

  Response – The statement is consistent with the Final FFS report.

- The Proposed Plan presents a summary of the RI and FFS and proposed a preferred alternative consisting of MNA (Alternative 2) coupled with enhanced in-situ biological remediation (Alternative 6). The Proposed Plan is unclear as to what environmental media (soil, groundwater or both) would be treated under the enhanced in-situ biological remediation portion of the preferred remedy.

  Response - The environmental media targeted for the selected alternative (Alternative 2 & 6) is the aquifer located under the Hatchco property. The preferred alternative will be effective in addressing the contaminants of concern in the saturated subsoil and in groundwater. The pilot study will be conducted to assess the best design to mitigate for groundwater contamination of the entire plume.

Hatchco is not willing to support any remedy that does not have a strong chance of being technically effective. More specifically, while Hatchco continues to support Alternative 2 (MNA) for the site, Hatchco has serious technical reservations and objections regarding the additional remedy adopted in the Proposed Plan, Alternative 6 (enhanced in-situ bioremediation). Hatchco's concerns regarding Alternative 6, as discussed more fully in the general and specific comments, focus on three specific areas:

Response – EPA supports Alternative 2 (MNA) for the groundwater downgradient of the Site and Alternative 6 (enhanced in-situ bioremediation) for source control. EPA has serious concerns with MNA as a stand-alone remedy. Hatchco has not adequately shown that MNA is an acceptable alternative for OU1. For EPA to consider MNA as a stand-alone remedy, Hatchco must demonstrate that MNA will meet the RAO's within a reasonable timeframe. Hatchco must demonstrate this using site-specific data or MNA cannot be selected as a remedy. Hatchco provides a minimal data set that does not meet the rigorous requirement to demonstrate that MNA will be an effective remedy for the OU1.

Hatchco performed the investigations for natural attenuation during the 2002 investigations (RI, 2003). MNA was correctly described as the mitigating effect of dispersion, dispersion, volatilization, sorption, abiotic degradation and biological degradation. Hatchco indicated they had followed the EPA Technical Protocol for Evaluating the Natural Attenuation of Chlorinated Solvents in Groundwater, September 1998, (EPA 1998) to determine the applicability of MNA to the site conditions. However, the field data presented in support of MNA by Hatchco are quite limited, and only address EPA's "screening criteria" to determine if a full evaluation of MNA should be implemented (EPA 1998). Hatchco places significant weight on biodegradation of the contaminants for the remedy selection, but does little to support the biological mechanisms as directed in the EPA protocol (1998).

The full biogeochemical data set in support of MNA is summarized in Table 7-5 of the RI report (2003). This table also shows the "points system" developed for EPA's screening process in 1998. (Note that the National Research Council, shortly after the EPA protocol publication, suggested this numeric ranking not be used to evaluate complex sites with intricate biological and hydrological circumstances. Rather, the proponent of MNA should use the best available biochemical and geochemical understanding to support their case.) Hatchco evaluated the field screening data from three wells using the "points" evaluation system. The groundwater field data indicated "inadequate" to "limited evidence for anaerobic biodegradation of chlorinated solvents". Using the EPA scoring system this site has "limited evidence" for success of MNA to contain the groundwater contaminant plume. Therefore, a full-scale natural attenuation evaluation is likely not cost effective and this technology should not be considered further. However, if the proponent of MNA still wants to propose MNA, then a full natural attenuation evaluation should be completed to support the proposed MNA decision for the site. While considerable modeling was done to support MNA, no biogeochemical support for this decision was undertaken by Hatchco. In addition, only limited quarterly monitoring of VOCs was performed during subsequent investigations to support this decision.

Therefore, only limited field evidence of reductive dechlorination, the primary attenuation mechanism, or contaminant mitigation exists for the site groundwater plume as presented in the FFS (2004).

The Hatchco site-specific data do not support MNA for containment of the groundwater contaminant plume. Besides the minimal data set, a number of critical parameters were never evaluated. For example, the site has never been sampled for methane, ethene, and ethane. Methane is produced under highly anaerobic conditions, the same as those required for reductive dechlorination. Ethene and ethane are end products of complete dechlorination of the contaminants. Although Hatchco refers to non-toxic end products resulting from the biological degradation of the contaminants, they offer no evidence that these compounds are produced at the site. The field data (Table 7-5) indicate aerobic conditions with elevated nitrate and sulfate concentrations. The redox conditions are high and not conducive to reductive dechlorination. The TOC is very low and does not support reductive dechlorination. The only evidence of reductive dechlorination is the presence of cis-DCE and VC. The biogeochemical evidence presented (Table 7-5) by Hatchco in support of this remedy indicates an aerobic to nitrate reducing environment ***NOT*** *conducive to reductive dechlorination.*

Groundwater analysis over the past four quarters was conducted to support the selection of the MNA remedy. However, Hatchco focused only on VOC concentrations and did not include biogeochemical data to support the assumption of biodegradation. The data from four quarters (Figures 6-14 - 6-19) of groundwater sampling do not support a decreasing concentration of total contaminants or even a decreasing trend in the more chlorinated compounds, indicating partial dechlorination. The plotted ratios of product/parent concentrations likewise do not support partial biodegradation but rather a stable concentration or an increasing parent compound concentration.

Based on the Hatchco presentation of evidence to support MNA as the selected remedy for groundwater treatment, there is inadequate support for biological degradation as a mechanism for the biological reduction of contaminant concentrations in the groundwater plume. In addition, there is no evidence (i.e., sufficient TOC), if biodegradation were occurring, that the rate could be maintained throughout the predicted timeframe indicated by modeling.

EPA believes the preferred alternative (Alternative 2 & Alternative 6) provides the best provability of success from the alternatives presented in the FFS. The preferred alternative is the most cost-effective and it will meet the site cleanup objectives on a reasonable time. EPA's concerns regarding the implementation of MNA alone is presented in the responses to the general and specific comments.

1. The description of Alternative 6 in the Proposed Plan is internally inconsistent and includes enhanced in-situ bioremediation of the vadose zone, an alternative that was specifically considered and properly eliminated as ineffective during the technology screening step of the FFS.

Response - Alternative 6 is consistent as presented in the FFS. The application of Alternative 6 is not intended to treat the vadose zone contamination. Alternative 6 is designed to treat VOCs in the contaminated aquifer (both, in the saturated subsoil and groundwater). Alternative 6 will enhance and accelerate the degradation rate of VOCs emanating from the source, the Hatchco property.

2. Alternative 6 is not justified without first collecting the data necessary to evaluate the effectiveness of MNA.

   During the remedial investigation, Hatchco collected data to evaluate whether MNA was taking place at OU1 according to the EPA's Technical Protocol for Evaluating Natural Attenuation of Chlorinated Solvents in Groundwater. The results were scored and compared according to a point system to determine if conditions exist to support MNA (via biodegradation) by a reductive dechlorination process. The score then was compared to an interpretation criterion that ranges from inadequate – limited - adequate, to strong evidence of anaerobic biodegradation. The OU1 specific data results indicated MNA via anaerobic biodegratation is inadequate to limited.

   EPA is concerned that the groundwater plume emanating from the Hatchco property, whether commingled or not, extends approximately 2500 feet west northwest of the Hatchco property boundary line and that contaminated groundwater plume is within 500 feet of several domestic wells. Furthermore, OU2 data show a potential increase of TCE contamination at a domestic well located within 500 feet of the western edge of the plume boundary line. ***It will not be prudent for EPA to wait and collect data for years to evaluate the effectiveness of MNA.***

3. The potential exists for Alternative 6 to result in short-term risks that are greater than any current risk associated with the Site. Such short-term risks coupled with the potential need for repeated treatments under Alternative 6 will hinder redevelopment of the Hatchco property.

   Response – This statement is inconsistent with the information presented to EPA. According to the Final Focused Feasibility Study Report, the Short-Term Effectiveness evaluation states, "No Short-term risks to workers, the community, or the environment are posed under this alternative. Protection will be achieved upon implementation of the IC restricting groundwater use." The short-term risks as presented in the final FS report posed no concern at the time risk assessment and the final FFS were released.

   EPA believes site redevelopment will improve the implementation of the preferred alternative, paving the site will reduce infiltration; therefore, reducing the contaminant loading to be mitigated by MNA once the active remediation is completed. EPA will work with Hatchco to plan and minimize interfering with the development of the area.

In light of Hatchco's limited resources, it makes no sense to spend additional money based on an extremely low probability of success. Hatchco proposes that Alternative 6 not be pursued at this time. Instead, Hatchco believes that current information supports selection of Alternative 2. Alternative 2 will allow the effectiveness of MNA to be assessed through scheduled groundwater monitoring. EPA will have an opportunity to consider, as part of the statutory five-year review process, whether natural attenuation is or is not occurring and, if not, whether other alternatives should be considered. Existing data suggests that natural attenuation is in fact occurring and the existing data are consistent with the conditions predicted by groundwater modeling.

EPA is aware of Hatchco's limited resources and has considered and secured funding for taking the lead for the RD/RA for OU1. EPA will evaluate the remedy annually and at the end of the statutory five-year review will make a determination on the effectiveness of the Preferred Alternative.

Hatchco has not adequately shown MNA as an acceptable alternative nor have they developed a meaningful mass term for contamination entering the groundwater from residual soil sources. Until this is done, the soil source must be considered to continually contribute to the groundwater plume. In the final analysis, Hatchco will need to demonstrate that MNA will meet the RAO's for the entire TCE plume within a reasonable timeframe. Hatchco will need to demonstrate MNA using site-specific field data or MNA cannot be selected as a stand-alone remedy.

EPA believes the Preferred Alternative has a high probability of success for the following reasons:

The use of enhanced in-situ bioremediation of chlorinated solvent is a very well known and field proven technology. The field data from the Hatchco site, although minimal, indicate that conditions at Hatchco can be enhanced to rapidly remove contaminant mass from the groundwater plume. Elevated concentrations of VC are indicative of reductive dechlorination processes occurring in the sub-surface. Although, the biogeochemical data do not support the assumption of conditions conducive to active reductive dechlorination, the conditions can be modified by addition of an electron donor to cause the rapid and complete removal of contaminant mass. The success of this technology depends upon the presence of a biological community that can reductively dechlorinate the contaminants to non-toxic compounds, i.e. - ethene and ethane, and an adequate supply of organic materials that can serve as the electron donor. The presence of the microbial community can be confirmed both by groundwater chemistry and by DNA analysis. The presence of adequate electron donor (organic compound) is assured by adding the required amount to stimulate the biological reactions. Proof of process is determined by monitoring the biogeochemistry and the mass of contaminant to show mass is removed and optimal conditions are maintained.

EPA proposed combining Alternative 6, enhanced in-situ bioremediation for source control with MNA for the downgradient plume. Hatchco has not conducted an adequate groundwater investigation to determine the conditions downgradient relative to reductive dechlorination. However, if source concentrations are reduced to low levels, then the dispersion and dilution that occur naturally will mitigate the concentration of the contaminants in the downgradient plume. If biological degradation is active, the plume will be rapidly reduced and MNA becomes a very effective tool for remediation of the groundwater plume. EPA has proposed a pilot study and field investigation to confirm the conditions under which the MNA scenario will be obtained.

EPA has also considered the potential application of enhanced in-situ bioremediation at the suspected secondary source. Enhance anaerobic biodegradation (EAB) combined with MNA can be an effective tool for large plumes by installing treatment cells at "hot spots" throughout the plume, especially where another source may enter the initial plume. This approach incorporates MNA to a significant, yet appropriate extent, and we believe the approach has a high probability of success and the active remediation will likely be complete within a reasonable time.

EPA accepts the determination that the degradation TCE in the aquifer suggests some evidence that MNA is occurring at OU1, although the elevated vinyl chloride concentrations suggest the degradation is or was incomplete. EPA also recognizes the plume may be commingled with an alleged, suspected secondary source in the vicinity of Jensen Automobile Shop. However, the fact that EPA did not detect high concentrations of VOC in soils at the suspected secondary source makes the Hatchco modeling inconclusive. EPA collected 25 vadose zone soil samples around the perimeter of the suspected secondary source (CDM RI, 2004). The sample results detected TCE in only one soil sample, at a concentration of only 0.9 ug/kg (CDM-RI, Figure 4-10). When comparing this single detection to the higher TCE concentration in the Hatchco vadose zone soil sample result of 90,000 ug/L, it seems unlikely that a substantial secondary source of TCE exists downgradient from the Hatchco property.

Hatchco's modeling did not include this suspected source in the evaluation of the entire TCE plume. Uncertainties with the groundwater fate and transport modeling still exist. Hatchco's modeling did not include an evaluation of a potential release during and after the air sparging pilot test. Since a work plan and the pilot test results report was not submitted for EPA's review, EPA did not evaluate the effectiveness of the pilot test.

Since EPA did not detect high concentrations of TCE in the vadose zone soil in the vicinity of the suspected secondary source, it plausible that the low groundwater concentrations immediately upgradient of the postulated secondary source are due to mass removal during the air sparge pilot test. Alternately,

intermittent early spills from Hatchco may explain the elevated TCE concentrations in groundwater in the vicinity of the Jensen Automobile shop.

EPA is concerned that the conclusions of the Hatchco model may not reflect the true nature and extend of the TCE groundwater plume. Due to this concern and the fact the contaminated groundwater plume originating from Hatchco is within 500 feet of a municipal well, several domestic wells, and coupled with the potential expansion of the plume, EPA sees a need to take an active response action rather than to wait and see whether or not MNA alone is an appropriate remedy for OU1.

General Comments on Proposed Plan

1. The Proposed Plan is Internally Inconsistent and Inconsistent with the FFS

In different parts of the Proposed Plan, Alternative 6 is described as treatment of vadose zone soils only, treatment of groundwater only and treatment of both vadose zone soils and groundwater. The Proposed Plan is therefore internally inconsistent; it is entirely unclear whether the Proposed Plan is attempting to adopt the Alternative 6 as presented in the FFS or whether EPA is intending to modify the alternative described in the FFS. This is a critical distinction because treatment of vadose zone soils by enhanced in-situ bioremediation was eliminated at the remedial technology screening stage of the FFS. Specific examples of confusing inconsistencies between the FFS and the Proposed Plan include the following:

Response – Alternative 6 is intended for the portion of the shallow aquifer located under and donwgradient of the Hatchco property. It is anticipated that Alternative 6 will be effective degrading TCE in saturated subsoils and groundwater. Pending on the pilot study and the technology application results at Hatchco, EPA is considering implementing the preferred alternative at the suspected secondary source located downgradient of the Hatchco property.

The description of the Preferred Alternative is inconsistent with the Cleanup Objectives discussed on Pg. 4 that include the following statement:

> *"EPA believes that treating subsurface soils at the source to remove high levels of VOCs, coupled with monitored natural attenuation will permanently reduce the toxicity, mobility, and volume of those contaminants that constitute a threat at the Site. Once contaminants are treated from the subsurface soil, EPA believes that over time natural processes will cleanse groundwater."*

Response – The Proposed Plan is not a technical document. The Proposed Plan is intended for the public use. Within the definition of sub-soils is included soil under the surface, soil in the vadose zone, soil in the saturated zone, or soil in the

aquifer formation. The Proposed Plan is not inconsistent with the FFS. EPA acknowledges that as written, the interpretation of the proposed plan may appear inconsistent with the FFS; however, via the responses to these comments EPA will attempt to clarify the intent of the Preferred Alternative as described in the Proposed Plan.

From this discussion, it appears that EPA proposes to treat vadose zone soils only and permit contaminants in the saturated zone to attenuate naturally. However, Alternative 6 is described on Pg. 5 as:

> *"the injection of a substance into the aquifer to speed up the breakdown of the plume downgradient of the source."*

Response – The statement is valid as written.

From this statement, it appears that EPA has selected direct treatment of the aquifer without treatment of the vadose zone. This is how Alternative 6 is described in the FFS. However, in the Summary of the Preferred Alternative EPA states:

> *"This combination of alternatives [2 and 6] would achieve cleanup objectives by……increasing the breakdown rate of VOCs in sub-soils and groundwater trough treatment."*

Response/clarification - "This combination of alternatives [2 and 6] would achieve cleanup objectives by……increasing the breakdown rate of VOCs in the aquifer (saturated sub-soils and groundwater) through treatment (In-Situ Biological/Chemical Remediation)."

Here EPA seems to be describing treatment of both the vadose zone and the aquifer. These inconsistencies were perpetuated at the public meeting where EPA stated that Alternative 6 consisted of aquifer treatment alone (August 24, 2004 Public Meeting Minutes, Pg. 14, lines 21 through 24).

Response – The statement is valid as written in the Public Meeting Minutes and clarified the intent of Alternative 6 at the public meeting. Alternative 6 consists of aquifer treatment alone."

Hatchco notes EPA's apparent confusion regarding distinct differences in effectiveness and implementability of in-situ biological treatment between the vadose and saturated zones. In fact, the option to treat the vadose zone using an in-situ biological method was eliminated early in the FFS process (Table 6-1, FFS, 2004).

Response – As stated in the Public Meeting Minutes, the intent of Alternative 6 is to treat the contaminated aquifer.

Elimination of in-situ biological/chemical remediation of the vadose zone resulted from low implementability and a limited record of successful applications of the technology at full-scale. The Denver representative for Regenesis (the HRC® vendor) reviewed the Site data and concluded that the Site is not a strong candidate for vadose zone treatment with HRC®. Correspondence from Mr. Herrington on this subject is provided as Exhibit A.

Response – Alternative 6 is not intended for the vadose zone.

More specifically, Hatchco notes the following factors limiting the effectiveness of an in-situ bioremediation of the vadose zone:

1. Limited free water in the vadose zone. Biological reactions occur where contaminants may freely dissolve into solution;
2. Difficulty in maintaining anaerobic conditions in the vadose zone;
3. Heterogeneity, stratification and high clay content of vadose zone soils limiting the ability to deliver HRC® to target horizons; and
4. Association of TCE with free-phase petroleum hydrocarbon exacerbating the adverse effects of limited free water and geologic heterogeneity (the highest concentration of TCE in the vadose zone was found in association with free-phase petroleum hydrocarbons). In order to degrade the target contaminant, the free-phase hydrocarbons must dissolve into limited soil moisture. This is unlikely to occur in the time frame associated with a single or even multiple applications of HRC®.

Response – Alternative 6 is not intended for the vadose zone..

In addition to these general and site-specific technical practicability issues, consideration should also be given to the low potency of the inferred source area. The source area described in the RI and FFS Reports is characterized by a layer of impacted soils between one and three-feet thick spread over a 0.5-acre area with an average TCE concentration of 29.78 mg/kg (direct push sample stations 64, 207, 82 and 41). This concentration represents less than 14% of the calculated soil saturation limit for TCE (RI Report, pg 6-25). Even the maximum TCE concentration measured anywhere on the site (91 mg/Kg) is well below the calculated soil saturation limit.

Response – Application of alternative 6 is not intended for the vadose zone. The Preferred Alternative has considered the low potency of the contaminated vadose zone area. This is one of the factors that favor the application of Alternative 6 to the aquifer in the source area.

Soil contamination is elevated within the "hot spots" indicated above. The concentration (91 mg/kg) is well below the "saturation" concentration as shown by Hatchco but is well

above the DAF of 0.06 mg/kg set by EPA. It is not clear how Hatchco determines the infiltration rate of contamination into the groundwater to indicate that these soil concentrations are not a problem resulting in continued groundwater contamination.

However, groundwater contamination below the apparent soil source area is relatively low, given the soil contamination. In addition, contaminant distribution within the groundwater indicates at least historical biological degradation. The rate of this biodegradation has not been clearly defined and therefore cannot be used to support that intrinsic biodegradation of the contaminants will contain the groundwater plume in the future. It is clear that a faster remediation rate in the groundwater, as proposed by EPA, would decrease the concentration entering the plume outside the source area and therefore be more amendable to MNA. Thus, the most cost effective approach to meeting remediation objectives is believed to be Alternative 6, as described in EPA's Proposed Plan, utilizing enhanced anaerobic bioremediation for high concentration source areas, and MNA for the remainder of the plume.

Active in-situ biological treatment of the vadose zone does not make sense in light of the low-level and diffuse nature of the inferred source area coupled with the general and site-specific implementability issues described above.

Response – Application of alternative 6 is not intended for the vadose zone.

Although direct aquifer treatment was retained in the FFS as Alternative 6, it required multiple treatments of the aquifer in order to degrade dissolved contaminants as they are introduced to the aquifer from the inferred low-grade source in the vadose zone. Direct treatment of the vadose zone was determined to have a low probability of success and was eliminated as an option as discussed above. The number of treatments necessary to treat the aquifer under Alternative 6 can be estimated by consideration of the following:

Response – Application of Alternative 6 is not intended for the vadose zone. Alternative 6 was evaluated by the FFS report.

- The HRC® product has an effective residence time of 18-months (according to Regenesis promotional literature). A relatively new product, HRC-X®, reportedly has an expected effective residence time of 3-years.
- The duration of the source term in contaminant transport modeling in the remedial investigation ranged from 10 to 40 years.

Assuming HRC-X® is used, between 3 and 13 treatments would be necessary to continuously degrade contaminants in the aquifer as they were introduced from the overlying vadose zone. The FFS assumed five treatments when developing the $328,800 present value for Alternative 6. The actual cost may be many times higher. Given the technical impracticability of in-situ biological treatment of

vadose zone and the complexity and cost of between 3 and 13 aquifer treatment events, Alternative 6 is not likely to be effective.

Response – This information is not consistent with the final FFS report. The information on the number of treatments necessary to treat the aquifer was presented to EPA in the final FFS report. The FFS report states, "Based on manufacture recommendations (HRC®), an initial treatment would be followed by additional treatments every two years using no more than 50% of the previous chemical dose. Based on this rule of thumb, a total of four treatments over a course of 10 years is assumed . . . The actual frequency and magnitude of treatment would depend on the groundwater quality monitoring data." (FFS July 2004, Alternative 6, Page 8-12)

Please note that the Proposed Plan did not endorse a vendor product, but it describes a propose technology "In-situ Biological/Chemical Remediation with Institutional Controls." The Proposed Plan describes a reduction of contaminant concentrations in the source area (not the vadose zone) with potential implementation of MNA downgradient from the source. EPA does not specify the mechanism(s) of natural attenuation in the downgradient plume but emphasizes reduction of the source area concentration is necessary to allow MNA processes to mitigate contaminant concentrations in the downgradient plume.

2. Inadequate Justification for Active Treatment

EPA's selection of Alternative 6 is premature for the following reasons:

- Insufficient groundwater monitoring data has been collected to substantiate EPA's primary justification for active remediation (the lack of declining contaminant concentration trends).
- Observed concentration trends over the monitoring period (4 quarters) are consistent with contaminant fate and transport modeling. Modeling predicts declining tends over a longer monitoring period.

Response – These two bullets contradict each other. The first bullet makes the point that four quarters of data are insufficient to justify active remediation. The second bullet suggests that four quarters of data are sufficient to validate a fate and transport model that predicts trends over a longer monitoring period.

EPA believes the groundwater monitoring data is insufficient to support Hatchco's modeling and MNA alone. See the discussion of inadequate evidence to support Alternative 2 in the following comments:

- Alternative 2 is protective of human health and the environment by minimizing the likelihood of human exposure to contaminated groundwater through the use of ICs.

Response - EPA is concerned that contaminated groundwater emanating from Hatchco and the suspected secondary source may continue to degrade groundwater resources. EPA and UDEQ have not made a determination that a secondary source exists downgradient from the Hatchco property. EPA is concerned that the secondary source has not been defined and the possibility still exists that the high levels of TCE contamination are due to earlier releases at the Hatchco property. EPA is concerned that a MNA remedy alone will allow groundwater to contaminate several domestic wells. ICs will not protect these wells from potential groundwater contamination.

- Monitored natural attenuation without active remediation has been implemented at other sites in Region 8 and is appropriate under applicable guidance.

  The implementation of MNA at another site has little to do with the acceptance of the remedy at this site

Hatchco believes that the remedial method proposed in Alternative 6 is of questionable efficacy, will interfere with site redevelopment and will not increase the protectiveness of the remedy (See below and General Comment No. 3). Accordingly, Hatchco believes that Alternative 2 should be allowed to demonstrate its effectiveness before EPA determines that other alternatives should be considered.

EPA has repeatedly expressed concern over the lack of decreasing contaminant concentration trends in groundwater quality. This is discussed on Pg. 7 of the Proposed Plan where EPA states that:

"Source remediation is needed at this Site because the evidence of natural attenuation in the groundwater at the Site is limited. No significant decrease in groundwater concentrations over time is evident in any well…."

Response - There is inadequate evidence to justify selection of Alternative 2, Monitored Natural Attenuation (MNA), as a stand-alone remedy at the Hatchco site for the following reasons:

- *There is insufficient groundwater monitoring data to support the contention MNA is active and currently mitigating the contaminant groundwater plume.*
- *The observed concentration trends over the monitoring period (4 quarters do not show a decreasing trend and therefore do not support MNA. Additionally, Hatchco has not included any effort using historic data to support the MNA remedy. EPA cannot accept the modeling predictions based on the available data to support a MNA remedy.*

- *Alternative 2, MNA, has not been proven and Hatchco has not attempted to support MNA as a stand-alone remedy with field data. Table 7.5 in the RI does not support MNA and does not support intrinsic biodegradation of the chlorinated solvents at the site. Therefore, EPA cannot accept MNA as a remedy that is protective of human health and the environment even with ICs.*
- *The implementation of MNA at another site has little to do with the acceptance of the remedy at this site.*
- *EPA has addressed the question of the efficacy of the proposed plan. The technology has been proven and site data justify the use of this technology at Hatchco. Site data show that reductive dechlorination at least to VC has previously occurred at the site, which is sufficient to determine that the process can be stimulated. These data are not sufficient, however, to determine that the process is presently occurring, nor that it will continue occur until the cleanup objectives are met, which would be required to select MNA.*
- *Source remediation is part of the selection of MNA as a remedy (OSWER Directive 9200.4-17P). Therefore, Hatchco must address this aspect of the remedy. Hatchco has not demonstrated MNA processes can effectively mitigate the groundwater plume with or without source input. Hatchco has not adequately demonstrated the efficacy of MNA at the site.*

It is clear from this summary that EPA would consider source remediation unnecessary if there was stronger evidence for natural attenuation at the Site and/or if their was evidence for significant deceases in contaminant concentrations. Hatchco believes that there is more than sufficient evidence to support the selection of Alternative 2 as a stand-alone remedy at the Site, including the following:

Evidence of Natural Attenuation

Hatchco believes that EPA has overlooked the following compelling evidence of natural attenuation:

- Decay products have consistently been observed in groundwater.

- Sorption, diffusion, dispersion and volatilization (partitioning from groundwater to soil gas) are also attenuation mechanisms (Pg. 15, OSWER Directive 9200.4-17P) that are occurring at the Site.
- The calibrated model incorporates contaminant degradation rates reflecting in-situ biological transformation of Site contaminants. The

observed groundwater quality trends during the four quarters of monitoring are predicted by the model.

Response - EPA considered this evidence for the selection of the Preferred Alternative.

Declining Contaminant Concentration Trends

EPA bases its conclusion regarding concentration trends on only four quarters of groundwater quality data. The lack of obvious declining contaminant concentration trends over the monitoring period is predicted by the contaminant transport model developed during the RI. Model output illustrating the predicted contaminant concentration trends at various monitoring wells across a single year is provided as Exhibit B. A review of the plots shows them to be similar to time vs. concentration plots based on groundwater quality monitoring data presented as Figures 6-14 through 6-19 of the RI Report.

Response – EPA based its conclusion on the nature and extent of the TCE groundwater plume emanating from the Hatchco property and extending west and within 500 feet of several domestic wells.

Although not included in the RI Report or the plots in Exhibit B, considerable groundwater monitoring data was collected by EPA in 2000 that indicates declining concentration trends over time. Hatchco objects to EPA's proposal to initiate active remediation prior to collecting sufficient data to evaluate time vs. concentration trends. A groundwater monitoring plan implemented as part of Alternative 2 would ensure the collection of such data. Should the data show that conditions at the Site are worsening or deviating from model predicted trends, other alternatives could be considered during the statutory five-year remedy review process.

Response – The data presented in the RI/FS is insufficient to support MNA as a stand-alone remedy. Hatchco has not presented adequate evidence in support of MNA for the following reasons:

- *There is little to no evidence to support declining concentrations based on the data submitted by Hatchco. The rate of biodegradation is most important in demonstrating MNA will meet RAOs in a reasonable timeframe.*
- *There is no supporting evidence for the primary mechanism for contaminant degradation (biodegradation). Evidence presented by Hatchco is preliminary, contradictory, and inadequate to support selection of MNA as the groundwater remedy.*
- *Intermediate decay products are present, but Hatchco has not demonstrated detoxification has occurred.*

- *Aattenuation mechanisms are always included in all MNA evaluations. If Hatchco contends one of the non-destructive mechanisms is more important than biodegradation in mitigating concentrations then the assumption should be supported with field data.*
- *The use of a model as the primary support for selection of MNA is not in keeping with OSWER Directive 9200.4-17P. EPA has previously noted the inadequacy of the input to this model for predictive purposes, especially the representation of site hydrogeology, the basis for biodegradation rates, the source term, and the calibration approach. In particular, the modeling is inadequate for the following reasons:*
  Conceptual Model and Hydrogeologic System Assumptions - The conceptual model used at Hatchco uses a single homogeneous aquifer system with two dimensions having isotropic properties across a 60-ft thick vertical interval. The system used in the model does not resemble the complex hydrogeological system at the site which is comprised of multiple layers of different types of soil types including sand, silt, clay, and gravel. Based on the cross-section, it would be expected that most of the flow is occurring in the sand zone which is 10- to 15-ft thick and starts at about 20 ft below ground surface. Slug testing showed variability of hydraulic conductivity of at least 1.5 orders of magnitude, reflecting to some extent (probably significantly underestimating) the heterogeneity of the different soil types. In the numerical model, a single hydraulic conductivity value based on the geometric mean of the three slug test values was applied to the entire 60-ft thickness across the whole domain. Furthermore, porosity and specific yield were never measured at the site, but were input in the model as single numbers based on the geometric means of literature values for three of the soil types – sand, silt, and clay. Groundwater flow and contaminant transport do not occur uniformly in different hydrostratigraphic units based on some average of the properties in those units. They occur based on the unique, site-specific properties of the units. While a representation such as this might suffice for a high-level screening of what flow and transport might be like at the site, it is wholly inadequate for use in predictive modeling upon which remedy selection can be based.

  Biodegradation Rates Assumptions - The degradation rate is a critical parameter for natural attenuation modeling because of the high degree of sensitivity of the model output to the parameter. Initial estimates of degradation rate for chlorinated ethene constituents were obtained both from literature values and from the Buscheck and Alcantar (1995) method built into the Biochlor model. The initial rates were then used for model calibration and were changed in order to provide the best fit between the model and the field data.

  In general, the approaches used to estimate degradation rate are appropriate for high-level screening, but are inappropriate for predictive modeling and remedy selection due to several shortcomings. Literature values, by definition, are not site-specific. While it is useful to understand the range of degradation rates at other sites for screening, they could be under entirely different conditions than a

site of interest. For example, several aerobic sites exist where little or no evidence of reductive dechlorination exists; it would be completely inappropriate to use literature values for predictive modeling at such a site.

The Buscheck and Alcantar method for estimating degradation rates has significant problems for use in long-term prediction of natural attenuation rates. These issues are discussed in detail in Sorenson et al. (2000), where it is pointed out that the relationship of dispersivity and the biological degradation rate is counterintuitive because of the use of the one-dimensional advection dispersion equation. As dispersivity is increased, the biological degradation rate estimate actually increases for a given data set. In fact, in cases where the effect of sorption is not large, the Buscheck and Alcantar method will actually yield a biological degradation rate that is greater than the gross degradation rate which includes dilution, dispersion, sorption, and degradation obtained directly through graphical extraction (Sorenson et al., 2000). In other words it gives a biological degradation rate that is greater than the actual degradation rate due to all natural attenuation processes combined. Even if the method were appropriate, it relies on the assumption that all wells are on the same flow path, which is a difficult assumption to support for MW-2S at least, because it appears to be completed in a completely different hydrostratigraphic unit than the downgradient wells.

While this is problematic enough, a further problem exists when using rates calculated in this way for predictive modeling. Because the calculated rate actually (inadvertently) includes dispersion effects, it is a poor predictor of future concentration trends. As shown in Sorenson (2000), the rate at which dispersion contributes to decreasing concentrations over time is a function of concentration gradients. Concentration gradients in a plume whose source is removed decrease over time, thereby causing the rate of contaminant decrease over time to decrease as well. Therefore, degradation rates which include dispersion can overestimate long-term contaminant degradation rates by as much as a factor of 7. Clearly, rates calculated using literature values or the Buscheck and Alcantar method are inappropriate for predictive modeling and remedy selection.

As stated in these responses there are many uncertainties associated with the information presented the RI/FS. EPA cannot accept MNA as a stand-alone remedy for the site. During the remedial design, EPA will conduct additional groundwater analysis to support efficient stimulation of biodegradation at the site and to determine the location of the treatment system. In addition, EPA will collect data to understand the natural attenuation factors that effect the contaminant concentrations in the plume.

No Net Benefit

Given the availability of municipal drinking water and the implementation of institutional controls on groundwater use at the Site, no reduction in the level of protection of human health and the environment would occur if Alternative 2 is

adopted as a stand-alone remedy, particularly in light of EPA's ability to consider other options during the five-year review process. It is also important to note that the acceleration of the natural contaminant degradation process under Alternative 6 is expected to accelerate the production of vinyl chloride, potentially increasing short-term risks. This is discussed further in General Comment No 3.

Response - EPA understands the biodegradation mechanisms associated with enhanced in-situ bioremediation. EPA will assure that no VC accumulates during the implementation of this technology. There are a number of means to mitigate such occurrence. Primary is the understanding that VC is an intermediate and ethene/ethane presence must be demonstrated as part of either an MNA remedy or an EAB remedy. No additional short-term risk will result from EAB implementation.

Not only will adopting Alternative 2 as a stand-alone remedy maintain protectiveness and provide consistency with EPA's policy of collecting adequate data to support remedy decisions, it also is consistent with recent remedy decisions for NPL Sites in the Salt Lake Valley. There are other nearby sites where source removal/treatment was not required, but an MNA remedy was instead selected in spite of the fact that the contaminants are inorganic (arsenic, cadmium, etc.) and do not degrade over any time frame.

Response – MNA as a remedy must be supported by site-specific data, not the fact it was accepted at other locations. Undoubtedly more expensive remediation strategies such as long-term pump-and-treat, have been implemented at other nearby sites, but that does not make them more appropriate for this site either.

3. Alternative 6 will Discourage Productive Re-Use of the Site and May Increase Short-Term Risks

Productive re-use of the Site should be an important consideration. From a redevelopment standpoint, Alternative 2 as a stand-alone remedy is superior to the Proposed Plan. Alternative 2 does not require extensive remedial construction while future Site redevelopment would likely be hampered under Alternative 6. At a minimum, several years would be required to design, implement, and analyze data from the pilot study considered in the Proposed Plan. For similar reasons, other alternatives, such as Alternative 4 (Soil Vapor Extraction), would have a negative impact on future reuse of the Site.

EPA should be aware that future Site use remains uncertain due to the fact that the Utah Transit Authority (UTA) has identified the Site as the preferred location of one of eight new stops (which would also include parking) for its Salt Lake/Weber County Commuter Rail project, a high-profile regional transportation infrastructure project. While UTA has not yet attempted to purchase or condemn the Site, construction of the commuter rail project is currently scheduled to begin in 2005, with the commuter rail segment opening in late 2007. In any event,

Alternative 2, as a stand-alone remedy, will not only be adequately protective of human health and the environment but would be the remedial alternative most consistent with Site redevelopment.

In addition, a potential increase in short-term risks under Alternative 6 may also adversely impact the ability to put the Site into productive reuse. Production of vinyl chloride is accelerated under Alternative 6 as compared with production rates under Alternative 2 alone. This effect has been documented by the HRC® vendor, Regenesis, at many sites (case studies are available on their website www.Regenesis.com). Vinyl chloride is more mobile in soil vapor and has a higher Henry's Law constant than either of the parent compounds (TCE and cis-1, 2 DCE). It is also more than twice as carcinogenic as TCE via the inhalation pathway (inhalation $SF_{TCE} = 0.006$ (mg/kg-day) $^{-1}$; $SF_{VC} = 0.015$ (mg/kg-day) $^{-1}$). These two effects may combine to create short-term risks exceeding current risks. In addition to being one of the nine NCP criteria, this potential short-term risk would further discourage development and productive reuse of the Site.

In sum, adopting Alternative 2 as a stand-alone remedy at this juncture would facilitate Site redevelopment while avoiding potentially significant short-term risks.

Response - As noted in our detailed review and recommendations, we believe site redevelopment might actually improve the implementation of the preferred alternative, because paving over much of the site will reduce infiltration, thereby reducing the contaminant loading to be mitigated by MNA once active remediation is complete.

Response - No additional risk is anticipated with the application of preferred alternative. The Final Focused Feasibility Study Report states, "No Short-term risks to workers, the community, or the environment are posed under this alternative (Alternative 6). Protection will be achieved upon implementation of the IC restricting groundwater use." The short-term risks as presented in the final FFS report posed no concern at the time risk assessment and the final FFS were released.

Specific Comments:

1. Pg. 3, right column, 2nd para. – EPA describes subsurface soil contamination levels as high. The maximum TCE concentration measured in any soil sample was 91 mg/kg or roughly one-half the soil saturation limit. This does not constitute "high levels of VOC's." As discussed in the Final RI Report, the residual contamination in the vadose zone is not concentrated. The inferred source area consists of a layer of impacted soils between one- and three-feet thick spread over a 0.5 acre area with a low average TCE concentration of 29.78 mg/kg .

   Response - EPA's description of the soil contamination as high is supported not only by the analytical data but also by the boring logs showing petroleum odor throughout the boring from 11 feet down and by the visible free product oozing from the sand/silt layer at 20' bgs. However, it is not clear whether the soil contamination will provide enough contaminant flux to groundwater once the high concentration in the aquifer areas are remediated. It is thought that once high groundwater concentrations are cleaned up, MNA will be sufficient to control any residual flux from the unsaturated zone soils. However, a realistic and rational approach to estimating the input to the groundwater can be developed. Hatchco has not done this estimation to determine whether MNA biodegradation processes (if occurring) can remove the estimated amount entering the groundwater with time.

2. Pg. 4, left column, 1st para. – The text states that the proposed action will be the first remedial action taken at the Site. Since 1995 Hatchco has taken many remedial actions including source removal and active groundwater treatment, including:

   - Removal of an oil/water separator.
   - Excavation and on-site treatment of contaminated gravel and native soils from a french drain.
   - Removal of waste oil UST and remediation of contaminated soils surrounding the UST.
   - Installation (in 1998) and operation of a five-well, low-volume air sparging system to treat contaminated groundwater.

   Hatchco has expended approximately $600,000.00 to date on investigative and remedial measures.

   Response - EPA acknowledges and has taken into consideration that Hatchco has taken several actions to cleanup contaminants at the Site. However, consistent with the NCP Section 300.435, ". . .RD/RA activities shall be in conformance with the remedy selected and set for in the ROD or other decision document for the site. This is the first ROD and therefore the first remedial action taken at the Bountiful Woods/Cross 5th South PCE Plume NPL Site.

3. Pg. 4, left column, 2nd para., 1st sent. – Subsurface soil concentrations are not high (See Specific Comment No. 1).

   Response - See response to Comment 1

4. Pg. 4, left column, 2nd para., last sent. – Treatment of subsurface soils by in-situ biological methods was eliminated during the technology screening step of the FFS (See General Comment No. 1).

   Response – The comment is consistent with the FFS report.

   Also, EPA explains that once contaminants are treated from the subsurface soil, natural processes will cleanse groundwater over time. It is also true that the natural processes will cleanse the groundwater to MCLs even if contaminants in subsurface soils are not actively remediated.

   Response - Alternative 6 will be applied to the aquifer zone area only. It is not clear whether the soil contamination will provide enough contaminant flux to groundwater once the high concentration in the aquifer areas are remediated. It is thought that once high groundwater concentrations are cleaned up, MNA will be sufficient to control any residual flux from the unsaturated zone soils.

5. Pg. 5, left column, 1st para. – The text describes injecting a substance into the aquifer to speed up breakdown of VOC's. It is not clear whether EPA is proposing vadose or saturated zone treatment or both (See General Comment No. 1 and Specific Comment No. 4).

   Response – The paragraph states, ". . a substance will be injected into the aquifer to stimulate bacteria activity . . .The overall purpose of this alternative would be to stimulate the breakdown of VOCs at the source, to speed up the breakdown of the plume downgradient from the source, . . ." The reference to the source, is the contaminated source area in the aquifer located directly under the Hatchco property. Alternative 6 does not include treatment of the vadose zone.

6. Pg. 5, right column, last para. - The text states that with the exception of Alternatives 2, 3 and 7c, all groundwater alternatives would eliminate human exposure risks from direct contact with contaminated groundwater through treatment. However, Alternative 7c also involves groundwater treatment at the POTW as stated under the description of Alternative 7c.

   Response – EPA recognizes this difference between the alternatives.

7. Pg. 6, left column, 1st para. - EPA describes the potential effects of a fluctuating water table on groundwater quality only in the discussion of Alternative 3. Because this effect may occur under all alternatives, the justification for

elimination of the capping remedy is premature. Capping, including barriers that may be installed in connection with Site redevelopment, may prove to be an effective remedy if coupled with Alternative 2.

The FFS identified several benefits associated with capping. These include acceleration of groundwater restoration by reducing the amount of infiltrating precipitation and associated leaching of contaminants from the vadose zone to the water table (Pg 8-7, FFS, 2004). Contaminant mass retained in the vadose zone would degrade naturally.

Response – EPA supports this action. If Hatchco wishes, EPA would not oppose a cap to redevelop the Site.

8. Pg. 6, left column, 4th para. - Maintenance problems are identified as a reason why pump and treat technologies may be unreliable. Although pump and treat systems are maintenance intensive, they are effective if hydraulic capture is established. The FFS identified the difficulty in establishing hydraulic capture while not adversely impacting third party contaminant plumes as the primary issue related to effectiveness and implementability.

   The text goes on to state that Alternatives 7a and 7b would have low, long-term risks, but the remedy *would take longer* to achieve cleanup objectives. The Proposed Plan does not compare remediation times for Alternatives 7a and 7b to other alternatives. Therefore, the phrase "would take longer" is meaningless. The FFS explains that with hydraulic capture established, the portion of the contaminant plume downgradient of the hydraulic barrier is expected to attenuate to MCLs by the year 2017. However, continued operation of the remedy beyond 2017 would be required until on-Site groundwater quality reached MCLs.

   Response – Alternatives 7a and 7b are also viable. However, EPA believes Alternative 6 coupled with MNA has a higher probability of success of meeting the site's cleanup objectives and is cost effective when compared to the alternatives presented in the FFS.

9. Pg. 6, left column, last para. - Alternative 6 is described as accelerating the natural destruction of VOCs at the source area and in the shallow aquifer. Direct treatment of the vadose zone was eliminated during the technology screening step of the FFS (See General Comment No. 1 and Specific Comment Nos. 4 and 5).

   Response – Source area refers to the contaminated aquifer under the Hatchco property. As stated in previous responses and the PP Public Meeting, the intent of Alternative 6 is to treat the aquifer. EPA's expectation is to decrease contaminant concentrations in the saturated soils and the groundwater plume.

   The text goes on to state that Alternative 6 would decrease the time needed to achieve cleanup objectives onsite and offsite. The Proposed Plan does not

compare remediation times for Alternatives 6 to other alternatives. Therefore, the phrase "would decrease the time needed" is meaningless. A remedy consisting of a failed attempt to treat the vadose zone coupled with up to 13 biannual treatments of the aquifer will not significantly decrease the time needed to achieve cleanup objectives when compared with any of the other alternatives.

Response – The third paragraph of the introduction of the Proposed Plan encourages the public to review other documents included in the Administrative Record. Remediation times are described in the FFS report. The information on the number of treatments EPA considered for treating the aquifer is presented in the Final FFS report. The statement that it will take up to 13 biannual treatments to treat the aquifer is inconsistent with the information presented in the Final FFS report.

10. Pg. 6, right column, 2nd para. - Alternative 6 is described as enhancing the natural destruction of VOCs at the source area and in the shallow aquifer. See Specific Comment No. 9.

    Response – Source, as presented in the referenced paragraph, is the portion of the aquifer located under the Hatchco property. Shallow aquifer is the entire TCE groundwater plume. See response to Specific Comment No. 9.

11. Pg. 6, right column, 6th para. - EPA states that Alternative 6 would take the least time to achieve final cleanup levels on and offsite (less than 13 years). Alternative 6 would take the least time to achieve final clean-up levels only if the residual contaminant mass in the vadose zone was destroyed through in-situ treatment. The likelihood of this is considered very low as discussed in the FFS and General Comment No. 1.

    The 13-year remediation time frame predicted by EPA under Alternative 6 is unsubstantiated. Through modeling, the FFS concluded that with complete hydraulic containment established at the property boundary, the down-gradient portion of the plume would attenuate to MCLs within 13 years. This scenario may not be applicable to Alternative 6 for the following reasons:

    - Complete destruction of residual contaminant mass in the vadose zone via in-situ treatment is a very low probability scenario.
    - Complete destruction of the on-Site dissolved phase plume would have to occur in the same time frame as the establishment of hydraulic capture. Hydraulic capture would most likely require a much shorter time frame.

    Response - As noted above, the impact of residual mass in the vadose zone on groundwater concentrations is unknown, but site redevelopment is likely to decrease that impact. If Hatchco would like to consider the use of soil vapor extraction to reduce the soil concentrations below the site, EPA would accept that approach. Significant shortcomings exist in the modeling for anything but

screening purposes, so the 13 years is simply a relative number. If the bioremediation approach incorporates recirculation for hydraulic control, then it would be equivalent to hydraulic containment, while also destroying the contaminants in the source area.

12. Pg. 7, Table 2 - The present value of Alternative 6 assumes five, biannual treatment events where only the saturated zone is treated. The cost of vadose zone treatment and additional treatment of the saturated zone beyond the five, biannual events is not included. Therefore, the actual cost of the preferred remedy described by EPA will be significantly higher (See General Comment No. 1)

    Response – Alternative 6 is not for vadose zone soils

    Treatment of the secondary source is not the responsibility of Hatchco as the secondary source is located 1200 feet from the Site.

    Hatchco has not fully demonstrated to EPA that it is not responsible for the contamination at the alleged secondary source. Results for the remedial investigation for OU2 do not provide any evidence that a secondary source exists in the vicinity of the Jensen Automobile shop. Even if Hatchco can demonstrate to EPA that, indeed, there is a secondary source, we know the contamination emanating from the Hatchco property may be commingled with a potential secondary source. This fact alone makes Hatchco join and several liable for the contamination at the alleged secondary source.

13. Pg. 7, right column, 1st para. - EPA describes the Preferred Alternative as increasing the breakdown rate of VOCs in sub-soils and in groundwater through treatment. See Specific Comment No 9.

    Response – See response to Specific Comment No 9.

14. Pg. 7, right column, 2nd para. - EPA states that source remediation is needed at this Site because the evidence of natural attenuation in the groundwater at the Site is limited. See General Comment No. 2.

    Response/Clarification - Source area (aquifer under the Hatchco property) at the Site. See response to General Comment No 2.

15. Pg. 7, right column, 3rd para. - EPA states that Alternative 6 will achieve substantial risk reduction through treatment/destruction of contaminants in the sub-soil and in groundwater both on and offsite. The accelerated breakdown of VOCs is expected to result in an increase in the production of vinyl chloride which is more mobile in soil vapor and more toxic than the parent chemicals. See General Comment No. 3.

    Response – See response to General Comment No 2 and No 3.

16. Pg. 7, right column, 5th para. - EPA explains that it will conduct five-year reviews until contaminant levels in soil and groundwater do not pose an unacceptable risk to human health and the environment. However, on Pg. 3 EPA states that current soil conditions are protective of human health.

    Response – See response to General Comment No 2 & 3

17. Pg. 7, right column, 7th para. - EPA explains that the Preferred Alternative uses alternative treatment technologies to the maximum extent practicable. While Hatchco recognizes EPAs preference for innovative technologies, Hatchco objects to the advancement of a technology that is expected to fail. See Specific Comment No. 9.

    Response - It is difficult to ascertain Hatchco's position on use of an innovative technology when they have used the same technology without enhancement to support the remedy of MNA. Hatchco has offered no evidence or support for its assertions that EPA's alternative will fail. EPA maintains that appropriate application of the preferred alternative has a high probability of success, and might even enjoy synergy with the redevelopment strategy for the site.

Hatchco has expended approximately $600,000.00 to date on independent remedial actions and in meeting the requirements of the Administrative Order on Consent (AOC). Thus, Hatchco is disinclined to enter into an AOC for remedial design and remedial action under the preferred remedy described in the Proposed Plan for the following reasons detailed in our general and specific comments:

- Available data do not support EPAs conclusion that it is necessary to treat vadose zone soils to restore the aquifer in a reasonable time frame.

  Response - Hatchco states vadose zone soils do not require treatment, and therefore MNA alone could be used. Hatchco has not supported this assertion, and furthermore has stated Alternative 6 will fail because it does not treat vadose zone soils. Such a contradiction cannot be supported.

- The treatment method proposed by EPA for vadose zone soils is likely to fail as determined during the FFS and more recently through an independent analyses by Regenesis.

  Response – Alternative 6 does not apply to vadose zone soils. Regenesis products have no relevancy to the technology proposed by EPA.

- The treatment method proposed by EPA for groundwater is impracticable and will interfere with future land use.

Response – As noted above, future land use is not only compatible with the preferred alternative, it may offer synergy.

- Implementation of institutional controls renders active remediation unnecessary for the short- and long-term protection of human health and the environment.

  Response – Institutional controls will not protect the domestic wells from being contaminated.

Conclusion on the Applicability of MNA at the Hatchco Site.

While the field data indicate reductive dechlorination has occurred in the past or may be occurring now, as evidenced by the metabolic products (cis-DCE and VC), the evidence that it will continue to occur is completely lacking in the RI and the FFS. The biogeochemical data presented are not adequately explained or presented in a manner to support the selection of MNA or intrinsic biodegradation of the contaminants as the preferred alternative for this site. The explanation presented by Hatchco of the biological mechanisms occurring in the groundwater are intended to support natural attenuation are inaccurate, misapplied or misunderstood and do not support the conclusion of intrinsic biodegradation of the contaminants leading to a selection of MNA. The four quarters of groundwater monitoring did not show a decrease in concentrations of contaminants nor were any data collected to support biological degradation of the contaminants within the system. Therefore, Hatchco relied solely on the modeling to determine MNA was an appropriate and effective remedial technology for this site. Hatchco claims to have followed the EPA protocol for evaluating natural attenuation in groundwater. However, the EPA protocol directs the proponent of MNA to conduct a full characterization in support of this remedial option if the screening data appear to support any or all of the attenuation mechanisms as a significant factor in contaminant removal. This characterization was not conducted. In fact the preliminary screening data support the conclusion that MNA is not occurring to any significant degree. Hatchco has attempted to accept the negative site screening data as indirect support of reductive dechlorination and move immediately to the use of fate and transport modeling to support an MNA alternative with no basis or an unknown basis for contaminant concentration reduction.

EPA has reviewed the site groundwater data and the data suggest the biological community required for complete dechlorination is likely present or has been present in the past to produce the metabolic products. However, the groundwater system appears to be limited in available electron donor (TOC) to drive the reductive dechlorination processes required to achieve complete reductive dechlorination, i.e., production of ethene. This is supported by the field data presented in the FFS 2004 (low TOC). Therefore, a logical interpretation of the data is that available electron donor is lacking and in-situ biodegradation could be enhanced by adding an organic electron donor into the aquifer near the source zone. MNA is likely an appropriate technology for the downgradient plume if the source area is reduced by an alternative technology.