

# MCCORMICK & BAXTER CREOSOTING CO.

## Responsiveness Summary for McCormick & Baxter Creosoting Co.

### III. RESPONSIVENESS SUMMARY

#### 1.0 INTRODUCTION

To provide interested parties with an opportunity to comment on the proposed remedial action for the McCormick & Baxter Superfund Site ("M&B Site" or "Site"), EPA initiated a 30-day public comment period for the Proposed Plan on September 15, 1998. On that day, EPA made the Proposed Plan and other documents comprising the Administrative Record for this ROD available at the Stockton Public Library and EPA's San Francisco office. EPA also mailed facts sheets containing the Proposed Plan were mailed to all interested parties. The fact sheet encouraged the public to attend a public meeting held by EPA, to mail written comments to EPA or to contact EPA with comments. EPA granted a request for a 30 day extension, which extended the comment period to November 16, 1998. Notifications of the original public comment period and the extension were published in the Stockton Record newspaper.

During the public comment period, EPA held a public meeting on September 28, 1998 at the Boggs Tract Community Center in Stockton near the Site. At this meeting, EPA representatives described the alternatives that were evaluated, presented EPA's preferred alternative, and answered questions about the evaluation of the M&B Site and the remedial alternatives under consideration. Comments on the proposed remedy were recorded at the meeting.

Pursuant to Section 113(k)(2)(B)(iv) of the Comprehensive Environmental Response, Compensation and Liability Act ("CERCLA"), 42 U.S.C. §9613(k)(2)(B)(iv), this section of the ROD responds to "each of the significant comments, criticisms and new data submitted in written or oral presentation" to EPA regarding the Proposed Plan.

#### 2.0 SUMMARY OF COMMENTS AND AGENCY RESPONSES

##### 2.1 Comments on Proposed Plan Received During Public Meeting

This section addresses the two comments received by EPA during the public meeting on September 28, 1998. One commenter spoke on behalf of California Cedar Products Company, which is located on Washington Street across from the M&B Site. The other commenter was an employee of Newark Sierra Paper Board, a company located on West Church Street in Stockton.

***COMMENT:*** The spokesperson for California Cedar Products stated that the company felt that it was very important to the community to put the Site back into beneficial use and that his company wished "to be involved in some further discussions regarding the future use of this property...[W]e believe this piece of property would be very valuable to California Cedar Products even with its potential limited uses...[W]e've been members of the community for a long time. We believe that we can get it back into the tax base of this community and use it wisely. We've been here since the early 1900s..."

**RESPONSE:** To allow for the possibility of redevelopment, EPA has selected a contingent remedy for soils. The contingency remedy would be triggered if EPA determines that a potentially responsible party or a prospective purchaser has sufficiently agreed in writing to undertake the contingency soils remedy as described in the ROD, including long-term operations and maintenance, and compliance with use restrictions regarding the soils remedy.

**COMMENT:** The employee of Newark Sierra Paper Board stated that there were four monitoring wells located on the Newark Sierra property and that they have not seen any evidence of contamination movement into those wells. He expressed concern with the steam injection technology that will be evaluated as a potential means to clean up contaminated groundwater at the M&B Site. He said, "That probably may not be the best thing. By mobilizing all the DNAPLs, you may not want to do that because if you don't capture it all, then you may move it further along. Right now if you've got it restricted as a zone, you'll probably just want to contain it and cap it."

**RESPONSE:** EPA recognizes the concern of the commenter about the potential for steam injection technology to spread contaminants rather than capturing them. EPA will be conducting a detailed evaluation of in sit thermal technologies, including steam injection, during the remedial design phase. The evaluation may include additional data collection, modelling to predict the movement of contaminants in the subsurface using this technology, and treatability studies. EPA will release fact sheets and conduct informational meetings as needed during the evaluation process to keep the public informed of the results of the evaluation. Whatever technology is proposed by EPA as the final groundwater remedy for the M&B Site, the same process that was held to select the remedy documented in this ROD would be followed: EPA will issue a Proposed Plan, hold a public meeting, and allow a 30-day period to receive comments from the public.

## 2.2 Written Comments on Proposed Plan

This section addresses written comments received by EPA and includes input from the California Department of Toxic Substances Control obtained during the concurrence process. CH2M Hill on behalf of Union Pacific Railroad ("UPRR"), owner of a portion of the Site, submitted the only written comments on the Proposed Plan.

**COMMENT 1:** "The proposed interim remedial action for groundwater has not been demonstrated to be necessary to protect municipal drinking water use of the aquifer and has the potential to be harmful for the site by causing downward migration of contaminants. Therefore, groundwater extraction should not be implemented."

In explanation of this comment, the commenter states that "the groundwater plume does not appear to be moving. For the contaminants of concern, the concentrations at the downgradient edge of the plume have either decreased or remained stable." The commenter also states that the plume does not adversely affect the drinking water supply, and points out that California Water Service Co. abandoned their Well #30-01 in March 1998 because of the brackish quality of the groundwater. As a result, the nearest drinking water well is located 3 miles east of the site. Based on this, the commenter believes that the need for the proposed interim remedy has not been demonstrated.

**RESPONSE TO COMMENT 1:** Data in the Remedial Investigation ("RI") report prepared by EPA indicates that the groundwater contamination plume is moving slowly; however, the report does not draw the conclusion that movement of the plume has stopped. The RI report shows that contaminants in groundwater have moved from the known source areas in the northernmost part of the Site to wells at the fenceline and beyond. EPA expects the groundwater contamination plume to continue moving, albeit at a low rate, in the future. DNAPL, which is considered a principal

threat waste and is the major source to groundwater contamination, has been found in two perimeter wells so far. It was measured in perimeter well DSW-4B and observed in perimeter well DSW-4C (although a quantitative measurement could not be taken at this well).

Naphthalene, one of the most mobile contaminants at the Site, has been detected in downgradient wells OFS-4D and OFS-4E, which are located beyond the Site fenceline. While naphthalene does not have an MCL value, it has been detected at concentrations above the EPA Region 9 Preliminary Remediation Goal (PRG) in these wells. Naphthalene is currently of more concern than at the time the RI report was completed because its PRG has since been calculated downward from 240 ug/L to 6.2 ug/L. Naphthalene in these wells is of additional concern because of naphthalene's tendency at high concentrations to mask the presence of other, more toxic, contaminants. In addition, more recent groundwater monitoring, not included in the RI report, indicates that dioxin concentrations are increasing in some wells. EPA considers these factors a sufficient basis to warrant active remediation in order to prevent any further movement of contaminated groundwater under adjoining property.

Based upon EPA's groundwater policy and as stated in the preamble to the NCP, EPA defers to aquifer designations made by the states. In response to the commenter's statement that the plume does not adversely affect the drinking water supply, DTSC has provided the following response:

"The Water Quality Control Plan (Basin Plan) for the Sacramento and San Joaquin River Basins" promulgated by the Central Valley Regional Water Quality Control Board (CVRWQCB) consider all groundwater in the Region to be of beneficial use unless specifically exempted by the CVRWQCB in accordance with the criteria of State Water Board Resolution No. 88-63. The groundwater in question is subject to no such exemption and therefore must be considered suitable for a beneficial use designation."

EPA's response to the comment that the proposed pumping "runs a substantial risk of making the problem worse by causing downward migration of contaminants" is that groundwater gradients, contaminant transport and NAPL migration can be controlled by properly located extraction wells. EPA will conduct extensive groundwater modelling to design the most effective groundwater extraction regime for site conditions. In addition, regular monitoring of the groundwater extraction system will be conducted and will detect if any downward migration of contaminants is occurring. The stated purpose of the interim system is to provide containment only, not cleanup; thus, a relatively low rate of pumping will be used. The preliminary groundwater pumping rate proposed in the FS report for Alternative GW/N-4 was 235 gallons per minute (gpm). In contrast, the high pumping rate evaluated in the FS report was 700 gpm. Pumping of the E-Zone wells was included in the FS as a design contingency. If modelling results indicate that pumping from the E-Zone is necessary to achieve containment, it will be incorporated into the design. DTSC has indicated that "with a properly designed monitoring program and appropriate modelling, DTSC agrees that a system can be designed to limit the potential for downward migration of contaminants."

**COMMENT 2:** "There are sufficient data to conclude that groundwater restoration is technically impracticable because of the nature of the geology and groundwater contamination at the site. EPA should issue a Technical Impracticability waiver for the site. This recommendation is consistent with EPA guidelines, and with the rules, regulations, and policies of the State of California including its Containment Zone Policy."

**COMMENT 2a:** "Site geology and DNAPL characteristics make groundwater restoration technically impracticable."

**RESPONSE TO COMMENT 2a:** Site geology and DNAPL characteristics are only two elements of a Technical Impracticability Waiver evaluation. EPA's "Guidance for Evaluating the Technical Impracticability of Groundwater Restoration" states that such an evaluation also address the following: "A demonstration that no other remedial technologies (conventional or innovative) could reliably, logically, or feasibly attain the cleanup

levels at the site within a reasonable timeframe." As discussed in the response to Comment 2b, EPA determined that evaluation of a promising technology for DNAPL remediation was warranted at the M&B Site. In making this determination, EPA considered information from the State during the concurrence process that supported further evaluation of in-situ thermal technologies based upon preliminary results from the Visalia Pole Yard Superfund Site.

**COMMENT 2b:** "Issuing a Technical Impracticability waiver for DNAPL-contaminated zones is consistent with EPA policy."

**RESPONSE TO COMMENT 2b:** The commenter discusses the method by which EPA can issue a "front end" TI waiver. EPA's "Guidance for Evaluating the Technical Impracticability of Groundwater Restoration" states the following: "Determining the restoration potential of a site may be aided by employing a phased approach to site characterization and remediation...[S]ite remediation activities can be conducted in phases to achieve interim goals at the outset, while developing a more accurate understanding of the restoration potential of the contaminated aquifer." Thus, the approach set forth in this ROD is consistent with the EPA Technical Impracticability guidance.

At the time EPA prepared a draft Technical Impracticability Waiver Evaluation for inclusion in the Draft FS Report, no technology had been effectively demonstrated to have a strong potential to remediate DNAPLs. Shortly after EPA had completed the draft evaluation, EPA received information that the application of steam injection technology at another wood treater site in California appeared successful. Based on these promising results and the technology's potential to provide a long-term solution for the Site, EPA determined that selection of an interim groundwater containment remedy for the Site would allow EPA an opportunity to further evaluate the developing technology before making a final groundwater remedy decision at the Site. Although DTSC has expressed concerns regarding the projected long term O&M and oversight costs associated with containment, which, in the absence of a Responsible Party, will be borne by the State, DTSC agrees with EPA that containment measures should be implemented until such time as in-situ thermal treatment measures are fully evaluated.

**COMMENT 2c:** "Issuing a TI Waiver is Consistent With the State of California's Containment Zone Policy."

**RESPONSE TO COMMENT 2c:** The State's Containment Zone Policy is not an ARAR. DTSC has provided the following response: "With sufficient justification a TI Waiver may indeed be consistent with the State's Containment Zone Policy; the threshold issue is whether the TI Waiver is appropriate at this time. As stated above, the State's position is no."

**COMMENT 3:** "Monitored Natural Attenuation (MNA), which entails assessing the extent to which groundwater contaminants at the site are naturally contained and naturally degrade, is an appropriate remedy for the site, is consistent with EPA policy, and should be considered as an alternative." In explanation, the commenter states that "the DNAPL source is most likely stable and present in residual concentrations."

**RESPONSE TO COMMENT 3:** EPA recognizes that Monitored Natural Attenuation (MNA) may be an appropriate remediation option for contaminated soil and groundwater under certain circumstances. However, EPA does not believe that MNA is an appropriate stand-alone remedy for the M&B Site.

As stated in the EPA guidance document, "Use of Monitored Natural Attenuation at Superfund, RCRA Corrective Action, and Underground Storage Tank Sites" (OSWER Directive 9200.4-17, November 1997), "In the majority of cases where monitored natural attenuation is proposed as a remedy, its use may be appropriate as one component of the total remedy, that is, either in conjunction with active remediation or as a follow-up measure. Monitored natural attenuation should be used very cautiously as the sole remedy at contaminated sites."

Regarding the comment that the DNAPL at the Site is most likely immobile, three monitoring wells at the McCormick & Baxter site have been identified so far as containing DNAPL in thicknesses of up to two feet, which is an indication of the presence of mobile DNAPL saturation. Mobile DNAPL will seep slowly through low-permeability layers whenever the pool is deep enough (i.e., sufficient hydraulic pressure). At the Wyckoff site in Washington, the U.S. Army Corps of Engineers calculated that 10 inches of creosote was enough to penetrate silt. Available data for the McCormick & Baxter Site does not lead to a conclusion that the DNAPL is not moving.

While documentation that a groundwater contaminant plume is stable is one consideration for determining whether MNA is an appropriate remedy for a site, it is also necessary to demonstrate whether the contaminants present can be effectively remediated by natural attenuation processes. Natural attenuation processes, particularly biological degradation, are currently best documented for compounds associated with petroleum fuel spill sites, such as benzene, toluene, ethyl benzene and xylene (BTEX), or for chlorinated solvents such as trichloroethylene (TCE). There is currently little documentation to support the selection of MNA for the majority of chemicals, including dioxin, associated with wood treater sites.

The guidance document points out the potential disadvantages of MNA, including the following:

- "Potential exists for continued contamination migration;" and
- "Hydrologic and geochemical conditions amenable to natural attenuation are likely to change over time and could result in renewed mobility of previously stabilized contaminants, adversely impacting remedial effectiveness."

According to the guidance, MNA should be selected as a stand-alone remedy only where it "meets all relevant remedy selection criteria, where it will be fully protective of human health and the environment, and where it will meet site remediation objectives, within a time frame that is reasonable compared to that offered by other methods." The in-situ thermal technologies that EPA is evaluating for selection of a final groundwater remedy have a much greater potential to reduce the Site remediation time frame than that offered by MNA as a stand-alone, final groundwater remedy.

In summary, as stated in the MNA guidance, "In general, monitored natural attenuation is not appropriate as a sole remediation option at sites where non-degradable and nonattenuated contaminants are present at levels that pose an unacceptable risk to human health or the environment." However, EPA recognizes that MNA could be a component of the final groundwater remedy selected for the M&B Site. EPA is evaluating the potential application of MNA for remediation of the dissolved contaminant plume in conjunction with its evaluation of in-situ thermal technologies for source removal.

**COMMENT 4:** "The California Department of Toxic Substance[s] and [sic] Control's (DTSC's) suggestion that dynamic underground stripping (DUS) or other technologies be used to "optimize the reduction of mobility, toxicity and volume of contaminants" is inconsistent with the remedy selection criteria in the National Contingency Plan (NCP). It will not accomplish an important remedial action objective of controlling migration of Dense Non-aqueous Phase Liquids (DNAPL), and it is not cost effective. Sufficient information exists to demonstrate that technologies such as DUS that increase the mobility of the groundwater contaminants at the site will not restore groundwater quality in complex, heterogeneous aquifers like those beneath the M&B site, and the use of such technologies should be screened out. The implementation of these technologies, even on a pilot basis, runs a substantial risk of making the problem worse, thereby increasing the ultimate cost and complexity of the remedy at the site."

**RESPONSE TO COMMENT 4:** EPA's decision to evaluate the use of in-situ steam injection or other in-situ thermal technologies to address DNAPL contamination at the M&B Site was discussed in the EPA response to Comment 2b. EPA has not selected in-situ steam injection as a

groundwater remedy for the Site; EPA has only stated that it will conduct an evaluation of the potential application of this developing technology at the Site. DTSC concurs with this approach.

**COMMENT 5:** "The choice of a remedy for soil contamination should be made in conjunction with site redevelopment plans to support the proposed beneficial reuse of the property." The commenter elaborated on this comment by stating that "it would be appropriate to prescribe a soil remedy that is contingent on redevelopment and which allows 3 years for sale and redevelopment plans to be finalized and presented to EPA for review."

**RESPONSE TO COMMENT 5:** To allow for the possibility of redevelopment, EPA has selected a contingent remedy for soils. The soils contingency remedy would be triggered if EPA determines that a potentially responsible party or a prospective purchaser has sufficiently agreed in writing to undertake the contingency soils remedy as described in the ROD, including long-term operations and maintenance, and compliance with use restrictions regarding the soils remedy. While EPA is willing to work with owners and prospective purchasers to redevelop the property, EPA cannot commit in this Record of Decision to delay remediation of the Site for 3 years. DTSC concurs on this response.

**COMMENT 6:** "The proposed protective cap remedy for contaminated soil at the site should be "performance based," i.e., based on a specified level of protection to be achieved rather than a specified type of cap. A soil cap, rather than the asphalt cap proposed by EPA, may be effective for this site and would be more aesthetically pleasing and beneficial to wildlife." The commenter makes the case that "a soil cap, if properly designed, can be as effective and easy to implement as an asphalt cap and potentially more cost-effective." The commenter also stated, "Should EPA, however, choose to specify an asphalt cap in the ROD, a 1- to 3-foot protection layer of imported clean fill should not be required. The site is flat, and an asphalt cap would be protective without this amount of fill."

**RESPONSE TO COMMENT 6:** The selected soil remedy is Alternative S-4. This would involve the construction of an asphalt cap for the western end of the Site after the shallow eastern end soils are excavated and consolidated in the western end. The contingency soil remedy is Alternative S-3, which is a site-wide asphalt cap.

In response to the commenter's statement that a soil cap may be more appropriate for the Site than an asphalt cap, EPA believes that an asphalt cap is necessary for the Site for the selected soils remedy for the following reasons:

- 1) Because the western area will be built up with consolidated contaminated soils, an asphalt cap would be necessary to enclose the edges of all of the built-up area to prevent the erosion that could occur at the edges of an elevated soil cap.
- 2) Because of the expected location of the groundwater treatment plant and the majority of the extraction wells in western portion of the site, there will be periodic vehicular traffic in this area for sampling and maintenance of the system. A soil cap would not be practical for this use. Given the expected duration of extraction system operation, an asphalt cap is considered cost-effective.
- 3) Without an asphalt cap over the consolidated contaminated material, the local POTW may require continued on-site collection of stormwater rather than allowing closure of the current system and permitting runoff from the Site to enter the City of Stockton stormdrains. FS cost estimates assumed that the stormwater ponds and collection system would be phased out once an asphalt cap was in place (site-wide under Alternative S-3 or in the western site under Alternative S-4). Continued operation and maintenance of the stormwater collection and discharge system would have a significant impact on future O&M costs.

4) Stockton does not receive year-round rainfall. Thus, an extensive site-wide irrigation system would have to be installed and maintained to sustain a vegetated soil cap.

In response to the commenter's statement that a soil cap would be more aesthetically pleasing to the community, asphalt capping is in keeping with the current industrial land use and zoning in the area. In response to the commenter's suggestion that a soil cap is "beneficial to wildlife," the Ecological Risk Assessment did not identify any significant terrestrial wildlife in the upland portion of the McCormick & Baxter property. The Site is located in an industrial area, which includes the Port of Stockton facilities, and is expected to remain industrial. The Site is also located at the I-5/Highway 4 interchange and is bordered by Washington Street, a major truck traffic corridor, limiting the Site's use as beneficial habitat for terrestrial wildlife.

In response to the comment that a 1- to 3-foot protection layer of imported clean fill should not be required, EPA agrees that a protection layer less than 1- to 3-feet may be appropriate. The amount of base that is necessary under the asphalt cap will be determined based on the expected future use of the Site.

If the contingency soils remedy is triggered as described in the ROD, EPA will require the final capping design to be consistent with the planned future use of the Site in addition to the other requirements set forth in the ROD.

***COMMENT 7:*** "The identified risks that led EPA to choose a remedy for contaminated sediment in Old Mormon Slough are overstated. It has not been demonstrated that contaminated slough sediments pose risks to human health or the environment sufficient to require remedial action. As a result, EPA should reevaluate the risk to determine whether remedial action is needed."

The commenter goes on to state that "dioxin levels in fish from Old Mormon Slough are below the level generally considered acceptable by EPA under CERCLA, as well as the level established by the Food & Drug Administration as acceptable for food supplies." The commenter further states that "EPA's calculations result in unacceptable risk levels only because EPA has made extremely conservative [exposure] assumptions."

Regarding ecological risks at the Site, the commenter states that "the observed mortality rate of benthic organisms in the bioassays exhibited no significant difference between the slough and relevant reference areas, and the degree of effect on survival, growth or reproduction does not correlate with the sediment PAH concentrations (a requisite for indicating causation). In other words, there is no correlation between the level of contamination and its effects on or injuries to any of the tested species. There is no evidence that site-related constituents in the sediments in Old Mormon Slough correlate with adverse effects on aquatic life. The available data simply do not support the proposed remedial action for the sediments in the Old Mormon Slough."

**RESPONSE TO COMMENT 7 RE HUMAN HEALTH RISKS:**

The judgement that consumption of fish from Old Mormon Slough represents a potentially significant health threat is not EPA's alone; two other public health agencies, at the state and federal levels, have reviewed the data on fish contamination in Old Mormon Slough and came to the same conclusion about the risk they pose to public health. The California Department of Health Services has issued a fish advisory for Old Mormon Slough, which recommends that people fishing in the slough "do not eat the fish you catch", noting that contamination in fish therein came from the McCormick & Baxter wood processing plant. In January 1997, the Department published a Health Consultation, which was reviewed and concurred on by the Agency for Toxic Substances and Disease Registry (ATSDR). This Health Consultation concluded there is an increased risk

of cancer in the range of  $1 \times 10^{-5}$  to  $1 \times 10^{-3}$  for "the low-end recreational fisher, high end recreational fisher (defined as six 8 oz fish meals per month), and the subsistence fisher (defined as nineteen 8 oz. fish meals per month)" for consumption of fish from Old Mormon Slough; the mid-to-high end portions of this risk range exceed EPA's acceptable risk range for Superfund and therefore constitute a potentially significant risk justifying remedial action.

Regarding EPA's procedure for determining acceptable dioxin fish tissue levels under CERCLA and the FDA dioxin action level: U.S. EPA policy on fish consumption risk assessment and the use of the FDA 25 ppt "action level" for dioxin in fish is summarized in a memo accompanying the 1990 release of a dioxin risk assessment for pulp and paper mills (Habicht, Sept. 12, 1990):

#### "RELEVANCE OF FDA ADVISORY LEVELS:

Some states base the decision to issue a fish consumption advisory or ban on FDA's chemical action levels. FDA exposure assumptions, in accordance with its legislative mandate, reflect expected consumption by buyers of fish in interstate commerce. FDA generally assumes, for example, that contaminated fish would not constitute a high proportion of such a consumer's diet. Fish sold in interstate commerce comes from many waterbodies, reducing the likelihood that a consumer will be steadily exposed to fish taken from a waterbody with high dioxin levels. In contrast, EPA is concerned about ... the individual who *frequently* fishes at the site or who *regularly eats* fish from the area. Thus, the FDA advisory number of 25 parts-per-trillion (ppt) for dioxin in fish would *not* be sufficiently protective where individuals are consuming more than a few meals per year. The EPA-FDA Standing Committee on Contaminants in Fish and Shellfish has encouraged the use of toxicology and *risk assessment* in establishing local sport fish advisories."

Regarding the "conservative" nature of EPA's risk assessment for McCormick & Baxter:

1. For the McCormick & Baxter risk assessment, EPA followed procedures outlined in national risk assessment guidance developed for the Superfund program and which therefore represents the standard-of-practice for risk assessment at Superfund sites.

Agency guidance on evaluation of chemical exposures for risk assessment (U.S. EPA, 1989a and Browner, 1995), directs that risk management decision-making will focus on a High End exposure scenario - defined as an assessment of realistic exposure for the upper 90th to 99th percentile of actual exposures in the potentially exposed population(s). For Superfund projects, the High End exposure scenario has been determined to be a Reasonable Maximum Exposure (RME) scenario as defined by RAGS, Part A (U.S. EPA, 1989a). Section 6.1.2 of RAGS, Part A notes "[t]he intent of the RME is to estimate a *conservative* exposure case (i.e., well above the average case) that is still within the range of possible exposures". Specific guidance on exposure factors to be used to estimate the RME is presented in supplemental guidance to RAGS on standard default exposure factors (U.S. EPA 1991) and the Exposure Factors Handbook (U.S. EPA, 1997).

2. The fish consumption risk assessment followed national EPA guidance for assessing risks from consumption of contaminated fish (U.S. EPA, 1989b and U.S. EPA, 1994). In addition, the fish consumption rates for a subsistence fisher, to which the commenter specifically objects, are supported by two fish consumption studies recently performed in California (S. Calif. Coastal Water Res Proj., 1994 and APEN, 1998).

In the first study, subsistence fishers consuming fish caught in Santa Monica Bay reported consuming nineteen 8-ounce fish meals per month. This fish consumption rate averages out over the entire month to 142 grams of fish per day, which corresponds to the 150 grams per day fish intake rate used in the McCormick & Baxter risk assessment for subsistence fishing. In the second study, subsistence fishers from West Contra

Costa County reported consuming up to 182.3 grams per day of fish (averaged over the entire month), with a 95<sup>th</sup> percentile value at 85.1 grams per day. Thus the 150 grams per day fish consumption rate used in the McCormick & Baxter risk assessment meets EPA's RME Superfund goal of assessing risks for exposures occurring between the 90<sup>th</sup> and 99<sup>th</sup> percentiles of actual exposures.

3. The other exposure assumptions specifically questioned by the commenter, those relating to exposure frequency (350 days per year) and duration (30 years per lifetime), are standard default values used by EPA for any Superfund RME risk assessment where site-specific data are not available (U.S. EPA, 1991).

Thus, the assessment of risks from consumption of fish from Old Mormon Slough as performed for the McCormick & Baxter site is consistent with standard EPA risk assessment guidance and with studies on consumption rates by subsistence fishers in California.

#### **References:**

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- U.S. EPA, 1997. Exposure Factors Handbook (Vols. I, II, III). Office of Research and Development. EPA/600/P-95/002F(a, b, c), August 1997.

#### **RESPONSE TO COMMENT 7 RE ECOLOGICAL RISKS:**

In support of the ecological risk assessment methods used by EPA, there are several methods to assess the potential for unacceptable toxicity of contaminants of concern to sensitive invertebrates: 1) the results of bioassay testing and subsequent statistical interpretation of data; 2) comparison of test results to bulk sediment concentrations or bioavailable fractions of contaminants using equilibrium partitioning; 3) comparison of dry weight sediment concentrations of contaminants to established action limits; and 4) the use of biomodels (such as Swartz et al. 1995) to predict potential toxicity given sediment concentrations. All of these approaches were used in the Ecological Risk Assessment (ERA) (U.S. EPA 1997). In some cases, the results agreed; in other cases, conflicting information was present. This is not unusual, nor indicative of poor test design or incorrect interpretation of data. Rather, it is indicative of the variable nature of the results of sediment investigations, and the need to observe the results of data using a "weight of evidence" approach. Specific comments relative to the external review are presented below and reflect EPA's view is that causal effects can be interpreted from a variety of analyses methods.

First, the review comment suggests that EPA incorrectly identified sediment samples from Old Mormon Slough as acutely toxic relative to reference using appropriate statistical analyses. Summary results presented in the ERA in Tables 5.12 and 5.13 are consistent with the

commenter's Table 1. These tables correctly identify statistically significant mortality in two Old Mormon Slough stations (OMS-CPA, OMS-MTH) for *C. tentans* relative to the SCR reference; and two locations in Old Mormon Slough (OMS-END, OMS-CPA) for *H. azteca* relative to the SJR reference. The suggestion by the commenter that mortality was not consistently higher is true; however, statistically significant mortality was present and must be considered when developing ecological risk assessments. The commenter's suggestion that acute toxicity was not present in any of the samples is not true, given the summary results in the ERA and the comments. In addition, it is generally not a good idea to base statistical data on the averages of individual samples comprising an area of interest, since this tends to numerically dilute the observed effect, as evidenced by the lack of statistical significance in OMS-Average relative to SCR in the *C. tentans* test. A more meaningful comparison would have been available if a composite sample of all OMS stations had been actually tested.

Second, although correlations between bulk sediment contaminant levels and observed mortality were poor, there were trends associated with the bioavailable portion of total PAHs and low molecular weight PAHs relative to test *C. tentans* (ERA Figure 6.1). This suggests that comparisons of bulk sediment contaminants to effects may not be a sensitive measurement, since bioavailability (and other factors) must be taken into account to better understand observed effects. It must be noted, however, that even if correlation exists, it does not imply causation, and that this kind of analysis alone is not a reasonable way to interpret the effects of contaminants of concern on benthic communities. Additional evidence relative to sediment contamination and its effect on benthic communities is associated with the absence of benthic organisms actually living in sediments collected from the site, and the high incidence of bioaccumulation of contaminants in the tissues of *L. variegatus* exposed to Old Mormon Slough sediments (ERA Section 6.1.1.4).

Third, comparison of sediment concentrations to established action levels or biomodels are another appropriate method for determining the potential for unacceptable toxicity. Individual PAH concentrations in surficial sediment from OMS-CPA, OMS-OWP and OMS-MTH exceeded federal sediment quality criteria, suggesting adverse environmental risk to benthic communities. The commenter stated that the Swartz biomodel was used to suggest "potential" damage in lieu of observed effects. The Swartz biomodel was not used for this purpose in the ERA. Rather, the model was used to provide another perspective on how to interpret biological effects relative to sediment contaminants of concern. The results of the model were similar to the toxicological test results, further adding to the weight of evidence that adverse biological effects were suspected relative to the sediments associated with the McCormick & Baxter site.

In summary, the approach used by EPA for the M&B ERA is consistent with EPA guidance for ecological risk assessment. The weight-of-evidence approach in the ERA used a variety of techniques to determine the potential for adverse ecological risk. In some cases, various techniques produced conflicting results; in others, the predictions agreed fairly well. In total, the conclusions in the ERA relative to the presence of contaminated sediments are probably not overstated, as suggested by the commenter. Rather, they reflect the logical conclusion of a weight-of-evidence approach designed to be protective of the environment.

#### **References:**

- Swartz, R.C., D.W. Schults, R.J. Oztretich, J.O. Lamberson, F.A. Cole, T.H. DeWitt, M.S. Redmond and S.P. Ferraro, 1995. "PAH: A Model to Predict the Toxicity of Polynuclear Aromatic Hydrocarbons Mixtures in Field-Collected Sediments." *Environmental Toxicology and Chemistry* 14:1977-1987.
- U.S. EPA, 1997. Ecological Risk Assessment of the Surface Water Operable Unit, McCormick & Baxter Superfund Site. Pacific Northwest National Laboratory. October 1997.

**COMMENT 8:** "The currently proposed remedy for sediment contamination in Old Mormon Slough should be further evaluated. The remedy relies on the inaccurate assumption that clean sediment is being naturally deposited in the slough from the Stockton Channel. However, the Stockton

Channel sediments are contaminated (by sources unrelated to the M&B site) at levels that exceed the proposed cleanup standards for the slough. In other words, natural sediment deposits in the slough will, over time, "undo" EPA's proposed remedy."

**RESPONSE TO COMMENT 8:** The existing data indicates that site-specific cleanup levels are not exceeded in sediments in the Stockton Channel immediately outside Old Mormon Slough, or at any other location that represents a potential source of direct sediment movement into Old Mormon Slough. The 10 mg/kg total PAH sediment concentration at the Stockton Channel Reference (SCR) sample location is not a potential sediment source to OMS. The SCR reference site is located at the dead end of the Stockton Channel near Weber Point. It is nearly a mile upchannel of OMS, and located in a similarly depositional environment (i.e., dead-end waterway) to OMS. Stockton Deepwater Channel sample stations (SDC-37, -38, and -39) are the stations closest to Old Mormon Slough. Data show that the COC concentrations at these stations are very similar to those found at the mouth of OMS.

The area of the Stockton Deepwater Channel near the M&B Site (at the Port of Stockton Turning Basin) is dredged regularly for navigational purposes. This in itself would tend to limit the accumulation of contaminated sediments outside of the mouth of the slough.

Because Old Mormon Slough will still be in connection with other surface water bodies in the Stockton area, there are other potential sources of sediment contamination present. However, EPA believes that there is no current evidence to support the commenter's presumption that a sediment cap placed in Old Mormon Slough would inevitably become contaminated. EPA does not believe that such an unsupported presumption should preclude active remediation of areas of principal threat wastes.

**COMMENT 9:** "EPA should not issue a Record of Decision (ROD) for the site that does not finally address all aspects of the Soils and Groundwater Operable Unit. The proposed soil remedy would require the movement and consolidation of surface soils, as well as the installation of a cap. Should EPA subsequently adopt of groundwater remedy that includes the removal of subsurface soils, the surface soil remedy would be disrupted and destroyed, resulting in unnecessary cost."

**RESPONSE TO COMMENT 9:** EPA is issuing a final ROD for soil and sediment, but an interim remedy for groundwater. Although the final groundwater remedy is unknown at this time, EPA believes that action to prevent further migration of the groundwater plume is warranted at this time, and so has selected an interim groundwater remedy. As stated in the ROD, EPA believes that the selected soil and sediment remedies are consistent with the interim groundwater remedy of containment. If EPA later identifies and selects as the final groundwater remedy a different groundwater technology that can restore the aquifer to drinking water standards, EPA will reevaluate the soil and sediment remedies to determine whether or not those remedies are consistent with any later selected groundwater remedy. EPA expects that the selected remedy will be implemented in phases. EPA considers implementation of the sediment cap for Old Mormon Slough the priority remedial action for the Site because of the risks to human health and the environment from the contaminated sediment. Implementation of the soil remedy for the Site is expected to occur at a later date than the sediment remedy to allow coordination with the proposed Site redevelopment. The two actions will be coordinated to the extent feasible. EPA does not believe that uncertainties about the final groundwater remedy for the Site should delay addressing current risks to human health and the environment.