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US Environmental Protection Agency,
National Remedy Review Board, and
Contaminated Sediment Technical Advisory Group

Subject: Recommendations for the San Jacinto River Waste Pits Superfund Site

To Whom It May Concern:

The National Remedy Review Board (NRRB) has been asked to review the proposed remedial alternatives for the San Jacinto River Waste Pit (SJRWP) Superfund Site. On behalf of the San Jacinto Citizens Against Pollution (CAP) community group, Environmental Resources Management, Inc. (ERM) appreciates the opportunity to submit these comments for your consideration.

CAP is an informal group of concerned citizens and businesses located in the vicinity of the SJRWP Superfund site that has come together to learn more about the issues associated with the chemicals of concern at this site and to better understand the remediation alternatives available. Living and working in the area makes the selection of an appropriate remedy to this situation of critical importance to the families and businesses that will be most impacted by the U.S. Environmental Protection Agency's (USEPA) final cleanup decision both during the cleanup itself and in the future.

At the outset, it's important for the NRRB to know that CAP shares the goals of USEPA. That is, the implementation of a comprehensive remedy that, first and foremost, provides protection of human health and the environment. While some in the community feel strongly that the best remedy is to remove all of the contamination from the River and move it elsewhere, the community members and businesses in CAP recognize after researching and speaking with experts that this intuitively obvious choice might actually not be the best response. On their behalf, they have asked ERM to provide some of the technical reasons and lessons from prior cleanups that explain why they are supporting a remedy that will permanently encapsulate the contamination in the waste pits. The citizens believe that such a remedy will minimize threats and considerable disruption posed by the actual removal process, avoid the potential for a catastrophic event during construction and provide a better assurance that there will not be adverse consequences from the inevitable residual contamination after a mass removal remedy.

CAP is concerned that the mass removal and off-site disposal alternative exaggerates potential benefits and underestimates potential harm to the environment. The mass removal remedy offers the false hope of completely removing dioxins from the river and ignores the potential for a catastrophic release of dioxins during the potentially long and difficult construction period.

A mass removal remedy will not remove all site contamination, and this project poses unique challenges making a mass removal remedy even more difficult. There is much that can go wrong when trying to remove waste pits incorporated into a large and dynamic river. It is likely that dioxin levels are much higher at the bottom of the waste pits, further increasing constructions risks. In addition, the river is prone to flooding. At a time when very heavy rainfall and associated flooding occur with increasing frequency, exposing high dioxin concentrations in the excavation and staging area(s) poses significant risks to human health and the environment. If a slug of dioxins is released during construction of a mass removal remedy, impacts on the river and bay could be substantial and protracted.

The NRRB should support a commonsense remedy that encapsulates the waste and armors the confined area to protect human health and the environment and avoids potential catastrophic risks associated with trying to remove waste material from the river.

The San Jacinto Citizens Against Pollution Community Group

San Jacinto Citizens Against Pollution is a group of citizens, business owners, and environmentalists advocating for an immediate and permanent solution to the San Jacinto River Waste Pits. The organization understands the emotional impulse to remove the waste, believing that if the waste is removed then there will be no additional risks to the river ecosystem or the communities it supports. However, given that mass removal requires a complicated and protracted construction process and the real possibility of catastrophic failure, the organization supports an in-place remedy.

To date, this organization has submitted over 900 letters from citizens in the impacted areas stating their preference for an in-place remedy. In addition, the group has gathered over 300 followers on social media, with letters of support published in the local media. A recent reader poll conducted by the Baytown Sun showed a significant portion of the respondents in favor of an in-place remedy. There is significant community support for containment of the waste pits.

The San Jacinto River Waste Pits Superfund Site

The San Jacinto River Waste Pits Site is on the western bank of the San Jacinto River located near the Interstate 10 (I-10) bridge over the San Jacinto River. The total size of the site is approximately fourteen acres. The waste pits are contaminated with polychlorinated dibenzo-p-dioxins, commonly called dioxins, and polychlorinated dibenzofurans, commonly called furans. In the 1960s, Champion Paper Company, now International Paper Co., had paper mill sludge that was contaminated with dioxins and furans placed at the site. The sludge was transported by barges from Champion's paper mill in Pasadena and

dumped into open pits that protruded out into the river. The waste pits were unstable, and the walls of the pits were washed away by the river.

The site was placed on the National Priorities List (Superfund) in March of 2008. In 2010, the USEPA directed the Potentially Responsible Parties (PRPs) to address the release of dioxins and furans into the San Jacinto River through the implementation of a temporary cap until the USEPA selected a permanent remedy. The cap consists of a geotextile membrane that secures the sediment in place, followed by a waterproof liner that prevents any surfacing liquids from entering the waste pits. An additional layer of geotextile membrane and rip rap isolates the waste from the river, holds the membranes in place, and armors the enclosure against currents, debris, and river traffic. The temporary cap was installed in 2011. The temporary cap was renovated in 2015, and the USEPA instituted a maintenance and monitoring plan to ensure there is no leakage from the temporary cap and the waste pit area is properly secured.

The PRPs for the site are International Paper Co. and McGinnes Industrial Maintenance Corporation, now a subsidiary of Waste Management Co. These parties are collaborating with the USEPA and other stakeholders on the investigation and restoration of the site and paying costs incurred during the Superfund process. The decision before the USEPA is the selection of the preferred remedy for the SJRWP Superfund Site. The two alternatives under consideration are: 1) removal of the waste pits and disposing of the material in an off-site landfill, and 2) securing the waste pits in place.

<u>Problems with the Removal and Disposal Remedial Alternative</u>

Environmental harm caused by sediment mass removal/dredging projects has been well-documented by scientists and engineers working in both the private and public sectors. Potential harms include:

- Fugitive emissions of the contamination during removal, drying, and transportation;
- Generation of diesel exhaust and dust particles during operations and transportation;
- Health and safety risks to the workers and the public associated with operation of heavy equipment and increased truck traffic on the highways between the site and the approved landfill;
- Release and transfer into the food-web of residual contamination brought to the surface during dredging operations;
- Movement of contamination downstream due to ineffective control measures (e.g., silt curtains), especially in large rivers like the San Jacinto;

- Potential for catastrophic loss of contamination at the site due to bank failure during excavation of the waste pits and/or severe storm events and associated flooding;
- Unintended contamination of recreational and commercial fisheries in downstream areas such as Galveston Bay due to residual contamination and/or potential catastrophic loss of contamination during dredging operations; and
- High cost associated with mass removal, transportation, and disposal compared to other more effective and less risky remedial alternatives.

Two reports have assessed the effectiveness of mass removal/dredging as a remedial alternative:

1. U.S. Army Corps of Engineers Dredging Operations and Environment Research Program's "The Four R's of Environmental Dredging: Resuspension, Release, Residual, and Risk", and
2. The National Research Council's "Sediment Dredging at Superfund Megasites: Assessing the Effectiveness."

The U.S. Army Corps of Engineers (USACE) report discusses the inability of dredging to remove all of the contamination:

> "Perhaps the most significant issue associated with dredging's potential effectiveness is the extent of residual contamination following dredging. No dredging operation can remove every particle of contaminated sediment, and field results to date for completed environmental dredging projects suggest that post-dredging residual levels, expressed as contaminant concentration in surface sediments, have often been greater than the cleanup levels."

Given that the San Jacinto River is a large and dynamic river, there is little question that contamination from the site will remain after dredging and that these contaminants will be transported downstream into the Lower San Jacinto River and Upper Galveston Bay, potentially impacting important natural resources and commercial operations (e.g., fishing, tourism).

The level of contamination deeper inside the waste pits is not well understood, but it is likely to be higher than surface results. This is important given the USACE report findings that:

> Given that deep sediment layers are commonly more contaminated than surficial layers, the potential for dredging to result in higher surficial

contaminant concentrations than before dredging is not only possible, but perhaps even likely in some instances."

These statements are not controversial, and summarize results found at every sediment site where water samples were collected during mass removal/ dredging operations that would be conducted in the San Jacinto River.

Furthermore, conditions at the SJRWP site present some unique challenges that are expected to make the loss and transfer of residual contamination even more problematic. First, the San Jacinto is a big and fast flowing river. The use of silt/turbidity curtains will likely be ineffective and may increase safety risks to workers trying to install and maintain them. Second, very heavy rain events and flash flooding is a common occurrence in the Houston area. There will be a large staging area to process the large volume of waste material removed from the river and waste pits. It will be difficult to control flooding in the staging areas. The rain events and flooding would likely transport waste materials away from any exposed waste material during mass removal operations. Third, this is a unique situation as the waste pits are submerged in the river and the mass removal remedy will require a contractor to remove an underwater landfill. The risk of failure under these conditions is significant and should be quantified during the NRRB review process.

Some community members may believe that all of the waste will be removed and the contractors will be prepared for any emergency, but the risks of a catastrophic failure cannot be eliminated. The fishery in the Galveston Bay area is highly valuable, which increases the consequences of these risks. There is a real possibility that contamination, perhaps in large amounts, may mobilize and be transported downriver during a mass removal remedy. The risk of catastrophic failure must be considered.

The National Research Council's special report to assess dredging's effectiveness in Superfund remediation confirms that there are serious risks and often few environmental benefits associated with dredging projects; issues include:

- Dredging equipment that disturbs sediment and redistributes some fraction of the contamination into the water in almost all cases;
- Sediment resuspension that can result in chemical releases to the water column;
- Contaminants can move downstream and could contaminate a large portion of the waterway;
- An absence of evidence that dredging projects lead to the achievement of long-term remedial action objectives; and
- That simple mass removal may not reduce risk.

The USEPA asked the USACE to provide a third party review of remediation options at the SJRWP. The USACE evaluated the dredging and in-place containment remedial alternatives. The USACE made the point that the full removal option would result in a significant increase in the exposure to dioxins in the river and bay due to erosion and transport of residual contamination during the dredging operation. This statement reflects a best-case scenario; if there was a catastrophic loss of material during dredging the waste pits or a significant storm and flood event during the actual removal/dredging operation, the likelihood of significant releases of contaminated sediment downstream occurring is very high.

The natural resources of the San Jacinto River and Galveston Bay are very important and highly valued; this exacerbates the risks associated with conducting a large-scale mass removal experiment in a unique situation that offers a small probability of success and a danger of making conditions considerably worse.

The In-place Containment Alternative

An armored, in-place containment remedy involves isolating the waste materials and keeping them in-place to prevent the migration of contamination and exposure of people and biota to contaminants. Further, in-place containment will minimize risks of a catastrophic failure during a large-scale mass removal remedy. In-place containment has been selected by the USEPA as the remedy at many sites across the country, including very recently at Portland Harbor, as a feasible and cost effective alternative to the removal of contaminated sediments.

In the unique situation of the SJRWP site, in-place containment further eliminates the need to remove the temporary cap, geomembranes liners, and the principal threat waste materials likely to be found inside the waste pits. This alternative is more technically feasible and cost-effective, minimizes short- and long-term risks, and is consistent with the shared goals of protecting human health and the environment. In our view it is clearly the preferred remedy, especially when the risks associated with the large-scale, mass removal alternative are objectively quantified. This site presents a unique challenge and should be addressed with a minimally invasive, reliable, durable, and well-understood remedy.

The USACE described the permanent in-place containment remedy as “highly effective in controlling the flux of contaminants and reducing the exposure concentration of contaminants in the water column.”

Concerns have been raised about the ability of the confined disposal area to withstand a barge strike. The USACE is confident in the cap’s ability to minimize impacts associated with barge strikes or other causes:

> The probability of a significant strike or grounding of a barge, which would expose contaminated sediment in up to 1 percent of the capped area or up to 0.2 percent of the contamination, is very low, likely less than 1 in 400 in any given year. A low severity strike would be expected to occur no more often than about once every fifty years on average, but its impact would be limited to several hundred square feet, less than 0.1% of the area, that could be readily repaired with minor losses.

When it comes to the permanent in-place containment remedy at the SJRWP site, scientific studies overseen and/or performed by government agencies highlight the remedy's expedient timeframe, feasibility, safety for nearby workers, protection of human health and the environment, and cost-effectiveness. The permanent in-place containment alternative improves the existing temporary cap consistent with recommendations from the USACE to withstand tropical storms, hurricanes, and flooding while keeping contaminants safely confined from the San Jacinto River and minimizing potential exposure to humans and wildlife.

A model that considered water currents and wave action was used to evaluate potential erosive forces associated with extreme weather events. These simulations demonstrated the reliability and permanence of the proposed in-place containment remedy. The confined disposal area would be stable and permanent, only requiring maintenance following unusual catastrophic events. The worst-case predicted losses from an extreme event would be relatively minor compared to the losses expected during the implementation of the large-scale, mass removal remedy.

Short-term risks to workers, the community, and wildlife are expected to be minor compared to the large-scale, mass removal remedy. Water quality impacts from turbidity associated with construction of the confined, in-place containment area would be low because the waste material would not be exposed to the open environment and silt/turbidity curtains would be much more effective along the shoreline than in the middle of the river channel. This remedy is more sustainable because the limited duration of construction would reduce fuel consumption, fugitive dust, air emissions from construction equipment, and truck traffic in the community.

The USACE report provided support for the permanent in-place containment remedy for the SJRWP site, especially compared with the large-scale mass removal remedy:

- The in-place containment alternative is expected to be highly effective in controlling the release of contaminants from the waste pits, thereby minimizing exposure to humans and wildlife;

- There is a low probability that barge strikes would impact the containment area;
- If the containment area was impacted, potential losses of contaminated sediment would be smaller than the losses from the mass removal remedy;
- Institutional and engineering controls are readily available to ensure the remedy is permanent and protects human health and the environment;
- The approach has been used at other waterways and has been demonstrated to be reliable and cost-effective; and
- Expected short- and long-term risks are expected to be very small compared to the large-scale, mass-removal remedial alternative.

The in-place containment alternative is, in our view clearly the best solution for the SJRWP Superfund Site. First and foremost, it does not risk catastrophic impacts to the long-term health of the community and environment by digging into and trying to remove the highly contaminated waste pits. It is known that in a mass removal/dredging, remedy residual contamination will remain in the environment and will likely be transported downriver into Galveston Bay. Because of the unique nature of this area (e.g., subjected to sub-tropical storm events and flash flooding) and the fact that the waste pits are submerged in the river, the full-scale mass removal/dredging remedy is simply too risky. A catastrophic event during the dredging remedy could cause significant environmental harm. The NRRB should follow the requirements of the Superfund process and select the in-place containment remedy. This alternative protects human health and the environment, is reliable, understood, cost-effective, and minimizes the short- and long term risks associated with construction operations.

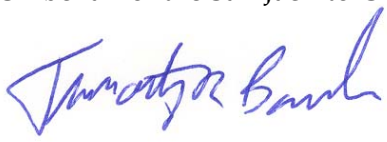
<u>Recommendations</u>

Based on the information presented herein, the in-place containment of the waste pits is recommended as the preferred remedial alternative because, in part:

- The risks to the workers, the public and the environment of a large-scale mass removal remedy are large and consequences could be catastrophic;
- The hypothetical benefit of the mass removal remedy is the purported elimination of all contamination, but this is unlikely to be realized and, in fact, this approach is likely to make conditions in the river worse for a considerable time;
- The armored, confined disposal area alternative has a more consistent track record of success and minimizes the risks associated with construction;

- The armored, confined disposal area approach can be implemented quickly, eliminating the current risk of exposure;
- The armored, confined disposal area alternative is more cost-effective, less disruptive to the community, and is consistent with the goals to protect human health and the environment; and
- For the safety of our community, the armored, confined disposal area alternative should be selected as the preferred remedy.

On behalf of the San Jacinto Citizens Against Pollution,



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