G. Fred Lee & Associates

27298 E. El Macero Dr.
El Macero, California 95618-1005
Tel. (530) 753-9630 • Fax (530) 753-9956
e-mail: gfredlee@aol.com
web site: http://www.gfredlee.com

Review of the Port of Stockton's Proposed CEQA Negative Declaration for the Port's Proposed Dredging Project

October 9, 2000

William Jennings
DeltaKeeper
Stockton, California

Dear Bill:

In accord with your request, I have reviewed the Port of Stockton's proposed negative declaration from CEQA requirements for the proposed dredging of 1,400 linear feet of dock area at the Port of Stockton West Complex. Attached are my comments on this draft negative declaration.

As discussed, I find that the Port has not provided a reliable basis for concluding that there will be no adverse impacts associated with this proposed dredging project. I have documented that there are significant technical deficiencies in the approach that the Port has used in characterizing the potential impacts of constituents that are or could be present in the sediments that could be adverse to fish and aquatic life and public health.

It is my recommendation that the DeltaKeeper request that a full EIR be developed for this proposed project that adequately and reliably discusses the potential impacts of it on water quality.

If there are questions about my comments, please contact me.

Sincerely yours,

G. Fred Lee PhD, DEE

GFL:ds
Encls.

Comments on Port of Stockton Proposed Mitigated Negative Declaration for Maintenance Dredging of Docks K, J and I

Submitted by
G. Fred Lee, PhD, DEE
G. Fred Lee & Associates, El Macero, California 95618
Tel: (530)753-9630 – Fax: (530)753-9956
Email: gfredlee@aol.com Website: www.gfredlee.com

Background

The Port of Stockton (Port) proposes to hydraulically dredge approximately 1,400 linear feet of dock area in the Port of Stockton West Complex (formerly Rough and Ready Island). The dredged material will be placed on Roberts Island #1. The Port has proposed that this dredging project be reviewed under a CEQA "Mitigated Negative Declaration." On the cover page in the paragraph headed "Finding/Determination," the statement is made that, *"... it has been determined that the project will not have a significant effect on the environment. Therefore, approval of a Mitigated Negative Declaration is recommended for this project."* These comments present a discussion of the inadequacy of the information submitted in providing the necessary documentation needed to support the Port's proposed mitigated negative declaration.

Overall Evaluation/Conclusions

The information provided by the Port in this proposed mitigated negative declaration does not provide the technical base of information needed to justify this declaration. As stated on page 1, such a declaration is based on the conclusion that, in this case, the dredging project would not have an adverse impact on the environment. The area of the Deep Water Ship Channel/Port where the dredging is proposed to take place is an area that is part of the critical habitat/migration route for several endangered species. Further, this area of the Deep Water Ship Channel has severe water quality problems with dissolved oxygen concentrations, at times, occurring below the water quality objective.

Also, the area is listed by the Central Valley Regional Water Quality Control Board as a 303(d)-listed "impaired waterbody," because of PCBs and organochlorine pesticides, as well as the organophosphate pesticides. Further, the area where the dredging is proposed to take place, at times, contains ammonia at concentrations that are toxic to some forms of aquatic life. Overall, the water quality in the area of the proposed dredging project is, at times, already severely degraded. Dredging projects of this type can cause increased concentrations of constituents in the water column that would violate water quality objectives for the 303(d)-listed constituents. This situation virtually rules out any possibility of conducting this dredging project under a CEQA negative declaration.

The data and their interpretation provided by the Port in support of the proposed negative declaration has little relevance to addressing many of the issues pertinent to the primary known water quality problems associated with this area. Basically, the Port has approached the characterization of the sediments that are to be dredged by conducting several tests of sediments using procedures that are designed to determine whether the sediments should be placed in a municipal landfill or a hazardous waste landfill, in accord with the Department of Health Services Title 22 regulations for

hazardous waste classification. The Port did not use the standard dredged sediment evaluation procedures that are routinely used in evaluating potential impacts of dredging projects on water quality. The testing of the sediments that has been done cannot be used as a basis to support a mitigated negative declaration. In fact, because of the potential sensitivity of the area to increases in pollutants and increased violations of water quality objectives associated with the dredging project, the types and amount of evaluation to support a negative declaration would require far more comprehensive evaluation than is typically done for most dredging projects.

The issues that need to be addressed in evaluating this dredging project include whether there will be sufficient oxygen demand stirred into the water column associated with the dredging project to cause the dissolved oxygen to be depressed further below the water quality objective in the area where dredging takes place. Such a depression would be considered a significant adverse impact to water quality.

Another issue that needs to be addressed is whether the constituents in the sediments are toxic to aquatic life. Sediment toxicity from known constituents cannot be reliably predicted based on concentrations of constituents in sediments. Further, toxicity could readily be caused by constituents in sediments that were not measured in the testing done. As an example, ammonia was not tested for, yet it is one of the most common constituents causing sediment toxicity in dredging projects. While a silt curtain if properly deployed and maintained can minimize the amount of sediment suspended in the water column during the dredging process, it will not eliminate it. Any suspension of sediments of this type could readily be detrimental to water quality, especially in a situation such as occurs in the Deep Water Ship Channel, where the dredging is proposed.

Another significant area for which information is lacking is the potential for constituents in the sediments to bioaccumulate to excessive levels within aquatic organisms. Of particular concern is whether the dredging project would increase the bioaccumulation of constituents present in the sediments. There could readily be PCBs and other constituents in the sediments, which are now reported as less than detection limits by the methods used, that as a result of the dredging project would be present at sufficient concentrations and locations to lead to additional excessive bioaccumulation in fish and other aquatic life.

Another potentially adverse aspect of this project is the possibility of odors released from this project, such as those caused by hydrogen sulfide, that could be adverse to those in the vicinity of the Deep Water Ship Channel.

A key component of any project of this type for dredging waters of this type will be a detailed, comprehensive monitoring program plan, to evaluate, during the time of dredging and following dredging, whether the dredging operations, as well as the dredged sediment disposal operations, cause or contribute to violations of water quality objectives.

Another issue that needs to be addressed is, what information/data has been obtained in previous dredging projects from this area. Since these areas have previously been dredged, a

discussion should be presented on the work that was done to characterize the dredged sediments and the monitoring results from the dredging and disposal operations.

Qualifications to Undertake this Review

My academic background includes an bachelors degree in environmental health sciences in 1955 from San Jose State College, a Master of Science in Public Health from University of North Carolina in 1957 and a PhD in Environmental Engineering and Environmental Sciences from Harvard University in 1960. For 30 years I taught graduate level environmental engineering/science and conducted research in these areas at several major US universities. I conducted over $5 million in research and published over 500 papers and reports on this work. One of the major areas of research emphasis was evaluations of the impact of contaminated sediments on water quality.

During the 1970s, under sponsorship of the US Army Corps of Engineers Waterways Experiment Station, I conducted over a million dollars in research devoted to developing dredged sediment disposal criteria. This research included evaluating samples taken from over 100 sites throughout the U.S. for the release of constituents from dredged sediments and several detailed field studies, where approximately 1,000 samples were taken around a dredging and disposal operation. I have published extensively on my dredged sediment research, including a chapter in the Handbook of Dredging Engineering, published by McGraw-Hill in 1992. An updated version of this chapter which will appear in the second edition of this handbook is currently in press and is available from http://www.gfredlee.com.. Many of my papers and reports on dredging and dredged sediment management are also available from my website.

I also have extensive experience in hazardous chemical ("Superfund" site) investigation and remediation. I have been active in these areas for about 20 years. Information on my activities, including my papers and reports on hazardous chemical site investigation and remediation, are available from my website. In summary, I have extensive expertise and experience in evaluating the potential water quality impacts of the proposed Port of Stockton dredging project.

Specific Comments

Page 2, first paragraph states that the dredging will occur over 1,400 linear feet of dock space shown in Figure 1. Figure 1 does not delineate where the dredging is going to take place. Also, this map needs to show the location of the areas on Rough and Ready Island where the state "Superfund" cleanup activities are being conducted. The proximity of areas where there is known hazardous chemical contamination to the areas that are being dredged should be delineated.

On page 2, under the first bulleted item, the statement is made that, "*The dredge removal areas ...*" this phrase should be replaced with, "The dredged sediment removal areas." The proposed project would remove approximately 65,000 cubic yards of sediment using a hydraulic dredging approach. The dredged sediment disposal area on Roberts Island #1 is said to have sufficient capacity so that there will be no runoff of dredged sediment-associated water from the dredged sediment disposal area.

On the bottom of page 2, the fourth bulleted item states that there is no dredged sediment-associated water runoff from the area of dredged sediment disposal. A significant deficiency with

this draft report is a failure to provide information on the hydrology of the region where the dredged sediment disposal is to take place. What happens to precipitation that occurs in this area? Does it run off and eventually be pumped into the channel? Does it infiltrate into the underlying groundwater system? This issue needs to be addressed. While the statement is made in this paragraph that there is a "*favorable sub-surface geology/stratigraphy,*" if there is no runoff from the area, then there must be recharge to groundwater.

The statement is made in the last line of page 2 and continuing on page 3,

> *"As an effective mitigation measure, these soils structures provide an excellent barrier and attenuation matrix for the slightly above maximum concentration limit (MCL) concentration of two metals (lead and barium) that were found in the dredge* [sic] *samples (C1, C2, and C3)."*

On page 2 in the last bulleted item, the statement is made that the silty clay and peat formation soils underlying the area where the dredged sediments will be deposited will be effective mitigation measures to prevent groundwater pollution by constituents in the dredged sediments. As discussed in a subsequent section of these comments, there is inadequate information presented to support this statement.

Page 3, the first bulleted item states that, "*The ground water on Roberts Island #1 is not used for potable and /or drinking purposes.*" That may be the current situation. Are these groundwaters suitable for domestic water supply purposes? If they are, they have to be protected from pollution independent of their current use. Data should be provided on the characteristics of the groundwater in this region, as well as the groundwater hydrology in the area.

Page 3 states, in the third bulleted item, "*All composite samples (C1, C2, and C3) were subjected to Citrate Buffer STLC analysis (worst case conditions for extracting leachable metals) and all results were non-detect.*" Just because the metals were not leached in the tests used does not mean that they are not leachable or extractable by organisms.

On page 3, the first paragraph mentions that the concentrations of lead and barium found in the dredged sediment samples C1, C2 and C3 were above MCL concentrations. It is indicated that this will not result in public health or environmental problems. Again, the technical base for this assessment is lacking.

At the bottom of page 4, the last paragraph discusses that the area was formerly owned and used by the Department of Navy, and that, as part of the US Navy use, there was contamination of land by hazardous chemicals. Apparently, part of the Rough and Ready Island area is a State of California "Superfund" site based on the fact that the clean-up of the site is being conducted under the supervision of the CA DTSC.

This draft report is significantly deficient in providing the information that is needed for its reviewers to reliably assess whether the hazardous chemical contamination that occurs on the island is an issue that needs to be considered in evaluating the appropriateness of the negative declaration

for the proposed dredging project. The fact that hazardous chemical contamination of the land exists near where the dredging is proposed makes it difficult to justify a CEQA negative declaration. Even if the known contamination on Rough and Ready Island is located at a considerable distance from where the proposed dredging is to take place, there could be hazardous and deleterious chemicals present in the dredged sediments associated with the Navy's former operations as well as the operations of other previous users of this property that have not been adequately evaluated by the studies that have been conducted by the Port in support of this negative declaration.

Page 5, the section entitled "Dredge Sediment Sampling and Analysis" indicates that three cored sampling points were used by the Port. No information is provided, however, on the specific locations of where these samples were obtained. It is indicated that the core samples were composited and a composite of each sample was submitted for analysis. However, no information is provided on the depth of sediment sampled, how the Port composited the samples, and other pertinent information needed to properly evaluate how the samples were collected and handled as part of data interpretation. This is a significant deficiency in this draft report. A report of this type should provide sufficient details on sample collection and handling so that someone else could duplicate the work done from the information provided.

The bottom of page 5 and pages 6 through 13 present the characteristics of the analytical methods and the results of the analysis conducted on these sediment samples. Apparently, in accord with CVRWQCB guidance for land disposal of dredged sediments and the information presented in Table 1 on the bottom of page 5, a suite of heavy metals was analyzed on samples extracted from the sediments using de-ionized water and the California Code of Regulations, Title 22 STLC leaching procedure, involving a citric acid buffer leaching. Also, chemical analyses of selected constituents in the sediment solid samples were conducted. Table 1 presents the detection limits for these analyses. Table 1 also contains information for the organics that were analyzed in the sediment samples. As discussed in a subsequent section, this approach does not provide an adequate information base upon which to reliably determine that either the dredging or the disposal operations that are proposed will not have an adverse impact to public health or the environment.

The top of page 7 shows that the various PCB congeners were present at less than the analytical detection limit of 3.3 µg/kg sediment. Pages 7, 8 and 9 present the results of the analyses for the organochlorine pesticides and the semi-volatile organics by GCMS. All of these constituents and many other measured organic constituents were found to be present in the sediments at less than the detection limits for the methods used. It is inappropriate to assume, as has been done by the Port, that finding selected constituents in sediments that are proposed to be dredged at concentrations less than the detection limits of the methods used is an adequate and reliable evaluation of the potential public health and environmental impacts of the proposed dredging project.

Beginning on page 14, there is discussion of the data obtained in support of this negative declaration. In the first paragraph, mention is made of *"... very low concentrations of dioxins which are below or very close to the unrestricted Residential Levels as set by the EPA's Preliminary Remediation Goals (PRG)."* PRGs are not a reliable approach for evaluating the potential for constituents like dioxins, chlorinated hydrocarbons and heavy metals to be adverse to human health

through bioaccumulation. The US EPA does not include this route of exposure in its PRG values. If they did, the PRG values for some constituents would be much lower than those currently used.

On page 14, the fourth bulleted item under "Polychlorinated Biphenyls (PCB by GC)," the statement is made that, *"All three samples (C1, C2, and C3) showed non-detect, below Method Detection Limit (MDL) for PCBs (see Table 2) as specified by the CVRWQCB."* This same type of statement is made in the next bulleted item for organochloride pesticides . Examination of the detection limits used shows that there could be potential for increased bioaccumulation of hazardous chemicals in fish and other organisms from the area associated with the resuspension of what are now currently buried sediments. Further, a new sediment surface will be created by the dredging project which will make available constituents that were not previously available for bioaccumulation.

Page 15, the third bulleted item (Metals Analysis) claims that, *"... citrate buffer extraction represents an extreme case condition for evaluating leachable metals."* Citrate buffer extraction does not address bio-uptake, which can occur at lower levels than those extracted by the STLC method. Further, this extraction approach does not address the well-known transformation that can occur in dredged sediments associated with upland disposal, where the metal sulfides present in the sediments are oxidized and the associated metals become mobile.

With respect to the organophosphate pesticides data, diazinon is listed on page 11 as having a detection limit of 0.4 mg/kg. There were no measurements made of the leachable fraction of the pesticides from the sediments. There could readily be release of diazinon at concentrations that would be above the California Department of Fish and Game water quality criteria. Further, there could be sufficient diazinon in the sediments that could be released upon dredging that could be toxic to aquatic life.

Page 16, under section 5.2 "Potential Surface Water Impacts, and Proposed and Project Inherent Mitigation Measures," the first bulleted item discusses "Potential Dissolved Oxygen Depletion While Dredging/Total Maximum Daily Loads." The end of that first paragraph states that the TMDL is designed to control oxygen consuming/depleting loads from the entire watershed to the mouth of San Francisco Bay. That is not true. The watershed of concern is upstream of the San Joaquin River Deep Water Ship Channel. There is no concern with respect to that TMDL on dissolved oxygen depletion loads below about Disappointment Slough on the San Joaquin River.

Page 17 states that,

> *"Potential exists for DO to be depressed during the maintenance dredging activities. However, this potential is eliminated due to the following mitigation measures:*
> ***Mitigation Measure No. 1:*** *The analytical data is non-detect and does not show any concentration of oxygen depleting compounds and constituents."*

No measurements were made that would address this issue. The VOCs, SVOCs, PAH, TEPH, TPPH, OC pesticides and OP pesticides are not measures of oxygen depleting substances; in fact, the majority of these materials would be considered refractory and not subject to biological degradation.

Mitigation Measure No. 1 is not a reliable, technically valid basis for estimating whether DO depletion could occur during dredging operations.

Page 17, "Mitigation Measure No. 2" states that, *"The duration of the actual dredging (Cutter head suction method) is short (7 days of actual water work), hence it limits the amount of time that the water column is disturbed."* This statement is also not a valid basis for claiming that there will be no DO depletion. As discussed by Lee and Jones Lee, 2000 in their San Joaquin River DO TMDL Issues report, DO depletion from sediments is frequently controlled by abiotic reactions involving ferrous iron and sulfides. These reactions are extremely fast. Suspending ferrous iron or sulfides into the water column from buried sediments, as can occur in the dredging project, can and usually does result in DO depletion. This could be especially important in the Deep Water Ship Channel if the DO present during the time of dredging is already severely depressed below the saturation value. In fact, the dredging project could cause the DO to be depressed sufficiently so that a water quality objective violation for dissolved oxygen could occur that would not have occurred if there were no dredging taking place.

On page 17, "Mitigation Measure No. 3" mentions the use of a silt curtain to minimize silt and sediments from being suspended throughout the water column. Even with the appropriate use of a silt curtain, there still will be suspension of sediments from the water column that can have an adverse impact on DO.

On page 17, "Mitigation Measure No. 4" states that the method of dredging will eliminate short-term and long-term BOD exertion to the water column. The approach used does not eliminate oxygen demand associated with the reduced chemical forms of iron and sulfur.

On page 17, "Mitigation Measure No. 5" makes reference to a report by Fred Lee, 2000, concerned with DO depletion in the Deep Water Ship Channel. First, the reference is not listed correctly, and second, the actual report (not the synopsis) discusses the importance of the reduced forms of iron and sulfur in causing oxygen demand.

In summary, the technical basis for the conclusion that there will be no DO depletion associated with the proposed dredging project is not valid.

On page 18, under the bulleted item "Entrapment of Juvenile Fish Species in the Cutter Head Suction Pump," "Mitigation Measure No. 1" states that,

> *"Juvenile resident fish species are primarily niched in the top 10 feet of the water column. For that very express purpose, the dredging contractor will be required to turn the cutter head suction pumps on when the cutter head is completely submerged at the bottom of the river. This eliminates the possibility of juvenile resident fish to become entrapped in the pump."*

As described, this does not prevent the entrapment of juvenile fish that are near the bottom.

On page 18, section 5.3 "Potential Ground Water Impacts,..." states, under "Mitigation Measure No. 1,"

> *"The concentration of the leachable constituents of Concern (COC), such as VOCs, SVOCs, TEPH, TPPH, and PAH are non-detect. Due to their low adsorption value to the sediment phase and their ability to desorb readily into the liquid phase/water column, these COC would be most significant in terms of their threat to the ground water. Due to non-detect concentration of the sediments the potential for these COCs to leach to the ground water is a non-issue."*

Again, there is a problem in data interpretation. Concentrations of constituents measured below the detection limit can be adverse to groundwater quality. Further, there can be other constituents in the sediments that were not measured that can cause adverse impacts to groundwater quality.

On pages 18 to 19, "Mitigation Measure No. 2" states, "*The analytical concentration of all metal under TTLC and STLC extraction procedures are either non-detect or non-hazardous ...*" On page 19, the discussion of lead not being hazardous and discounting the OEHHA goal as being overly stringent and unrealistic is inappropriate.

Page 20, "Supporting Mitigation Measure 2.2," claims that the low hydraulic conductivity of the clay layer provides excellent protection for vertical migration to the groundwater table. Examination of the boring log on the last page shows that the K value for the hydraulic conductivity of clay is 10^{-5} to 10^{-2} gallons per square foot per day. While no information is given on how these measurements were obtained, 10^{-2} is not "low" hydraulic conductivity. That value represents rapid transport.

Page 21, Mitigation Measures 3 and 4 claim that, since the Port owns the property, any pollution of groundwaters will not be a problem since the groundwaters are not used for domestic purposes. Independent of ownership, the Port does not have the right to pollute groundwaters. Further, it is stated that since the Port owns the property, no crops will be developed in the area. While the situation may apply now, it may not necessarily apply for as long as some of the constituents that are present in the sediments deposited on Roberts Island #1 would be a threat.

An area of increasing concern associated with land disposal of wastes, including contaminated dredged sediments is the potential for bioaccumulation of hazardous chemicals in the terrestrial food web. The Port has not addressed the issue of the potential for hazardous chemicals, such as some of those measured in the sediments, that were found at concentrations below the detection limits of the analytical methods used, to accumulate in the surface soils/sediments in the disposal area. These accumulated constituents could then be taken up by terrestrial organisms and accumulate in the terrestrial food web to a sufficient extent to be hazardous to terrestrial organisms (plants and animals), including man. This issue should be addressed by the Port, including the development of an appropriate monitoring program to determine whether this potential problem occurs.

Page 21, under 6, "Conclusions and Recommendations" concludes that the potential impacts of the proposed dredging project will be properly mitigated by the mitigation measures proposed. The

basis for that conclusion, being the information presented in this draft proposed negative declaration, does not support that conclusion. In fact, because of the already well-documented water quality problems that exist in the region of the proposed dredging, there could readily be adverse impacts.

This project, rather than being conducted under a negative declaration, will require a highly comprehensive, biological effects-based monitoring program. This monitoring program should be presented and critically reviewed by the public before the project proceeds. Further, mitigation measures should be presented and discussed in detail on what steps will be taken if it is found that DO depletions, bioaccumulation or other potential adverse impacts occur associated with the project. In addition, considerable additional work needs to be done to insure that there are no potential adverse impacts associated with disposal of the dredged sediments on Roberts Island #1.