Natomas Levee Improvement Program Update, March 20, 2008

Execution of the Natomas Levee Improvement Program

In October 2007, the City of Sacramento and the County of Sacramento asked the U.S. Army Corps of Engineers (Corps) to determine whether the Natomas Basin levees could be certified to the 3 percent annual flood risk level, in support of their application to the Federal Emergency Management Agency (FEMA) for an "AR" flood risk map designation. On January 15, 2008 the U.S. Army Corps of Engineers, Sacramento District, announced that based on a preliminary technical screening analysis the basin does not meet the current Corps 3 percent certification criteria. As a result, when FEMA's preliminary National Flood Insurance Rate Maps (FIRMs) for the Natomas Basin are finalized in December 2008, the basin will be mapped with an "AE" designation, which is the highest risk designation used by FEMA for levee protected basins. In accordance with FEMA regulations, the result will be that flood insurance will be required for all homes with federally insured mortgages, and new construction in the basin will be effectively halted.

These developments have created concern in the community about the level of flood risk, as well as great concern about the economic effects on the region due to a cessation of orderly development within the basin. Only through SAFCA's Natomas Levee Improvement Program (NLIP) can these concerns be resolved. Accordingly, SAFCA's efforts to expedite these improvements in cooperation with the State of California (California Department of Water Resources and the Central Valley Flood Protection Board, collectively referred to as the State) and the Corps have become the focus of attention and concern.

These concerns can be summarized as a series of questions:

1) What is SAFCA's current schedule for execution of the Project, including critical milestones and constraints?
2) What are the risk factors which could cause additional delays, and what actions can be taken to improve the odds of staying on schedule or accelerate it?
3) How big is the flood risk in Natomas, and should the community seek State and Federal declarations of emergency to break through the normal review and permitting processes?

This report provides my responses to these questions.

What is SAFCA's current schedule for execution of the Project, including critical milestones and constraints?

At the July 20, 2006 SAFCA Board meeting staff presented an information

update about NLIP, which included a preliminary cost estimate of $414 million dollars and an execution schedule showing work beginning in the 2007 season, completion of 100-year certification compliance requirements by 2010, and completion of 200-year improvements at the end of 2012.

Despite a major re-design of the program in response to new Corps vegetation guidelines, new Corps requirements to conform to 33 USC 408, as well as unresolved technical and policy considerations, we have worked to stay within that execution timeframe, and continue to believe that it can be achieved.

While the original NLIP proposal was based upon strengthening and raising the levees in place, with the option of constructing a setback levee along the northern part of the basin, the revised plan calls for constructing an adjacent levee, resulting in a single, enlarged levee cross section over most of the reach of the Sacramento River East Levee, requiring a massive earthmoving operation in excess of 5 million cubic yards of soil. The new levee footprint, the need for excavation to obtain the soil, the logistics of transporting the material, the need to address critical habitat impacts and enhancement opportunities, and the concurrent efforts to improve aviation safety has resulted in a superior plan, but one which is quite complex in execution.

With the anticipated remapping of the Natomas Basin with a FIRM map "AE" designation, however, it has become critically important from an economic perspective to rapidly achieve 50 percent completion of the critical elements of the project as soon as possible, in order that the map designation can be updated to "A99". Such a designation would eliminate the most severe flood insurance requirements, and development could once again resume in accordance with local land use plans. Our current analysis of the program execution suggests that the earliest point in time at which the A99 milestone can be reached is at the end of the 2009 construction season, with a potential change in designation by March 2010.

The current program schedule is summarized at three levels of detail in Attachment A. Each level of detail is shown in a different color: General project categories are red, major project elements are blue, and execution tasks are green. As shown in Attachment A, there are eleven general project categories, including:

Project Management
Permits
Real Estate Acquisition and Management Agreements
Funding
Design
Construction
Certifications
Habitat Installation
Habitat Establishment, and

Operations and Maintenance

Under these categories are organized over 60 project elements supported by 1500 execution tasks. The schedule is a working document which is regularly updated as the work evolves, conditions change, and decisions are made. The schedule provides most detail for those tasks which are most urgent and critical to the overall execution of the program.

As noted above, the schedule calls for achievement of the 50 percent completion milestone by the end of the 2009 construction season and an updated map designation by March 2010, completion of 100-year construction by the end of the 2010 construction season and an update map designation by March 2011, and completion of 200-year construction by the end of the 2012 construction season.

What are the risk factors which could cause additional delays, and what actions can be taken to improve the odds of staying on schedule or accelerate it?

Achievement of these goals, particularly the 50 percent completion milestone, in 2009 will be very difficult to achieve.

Based on careful coordination with the Corps, the schedule shows that the review and approval process needed to obtain federal permits for major levee construction will not be completed until after the 2008 construction season is past. Accordingly, SAFCA will focus on completing previously authorized work originally planned for 2007, and completing all right-of-way acquisitions and relocations needed to expedite in 2009 the work originally scheduled for the 2008 construction season. It is critical that these acquisitions and relocations be handled with adequate lead time and due process, respectful of the rights and concerns of affected property owners.

This strategic shift does not necessarily push back the work planned for 2009 and 2010; from a construction standpoint these can be advanced concurrently as planned since these respective project segments are located in different portions of the levee system.

However, the federal permitting process for the 2009 work will be difficult to complete in a timely manner as well, since there will be substantial overlap between the completion of the 2008 permitting documents which are currently underway, and the 2009 permitting documents, which will be initiated shortly. It is anticipated that these overlapping processes will severely tax the capabilities of the Corps given the aggressive timelines.

Given the intense concern about the execution timeline, on January 17, 2008 I invited the City of Sacramento to independently review the program execution schedule as of January 17, to evaluate the potential for speeding up the work. City staff kindly agreed to perform this independent review and

engaged MWH Americas Inc. (MWH) to complete it. MWH carefully reviewed and analyzed the schedule as of January 17, interviewed NLIP program managers and staff, and prepared its final report on March 10 (Attachment B). MWH concluded that the schedule is very aggressive and has been developed based on many assumptions, including:

- Field explorations will not be limited by right of way constraints.
- Design will progress on a fast-track basis, with reaches designed and constructed in parallel sequencing.
- Time required for agency and stakeholder review will be minimal. SAFCA is providing funding to resource agencies to ensure staff availability.
- Temporary and permanent right of way will be acquired quickly and will not delay the work.
- Public and private utility relocations will proceed ahead of flood control activities and not impact the schedule.
- SAFCA is proceeding with levee design prior to Federal certification of hydrology/hydraulics and the design water surface. The NLIP schedule assumes certification will be achieved without modifications/revisions that might change the project being constructed or certified to provide 100-year flood protection.
- Permitting and regulatory compliance will proceed at an accelerated rate.
- Construction black-out periods due to endangered species and flood season constraints will be minimized by constructing an adjacent levee and working closely with the resource agencies.
- Construction production rates for the cut-off walls are partially based on experience from work completed in 2007 along the Natomas Cross Canal (NCC).
- Funding is available and will not control the schedule.
- Any legal actions arising from the NLIP will not cause delays to the schedule.
- There will be no weather-related delays.

MWH identifies key risk factors which could delay completion according to the schedule:

- The Corps may develop water surface profiles that differ from SAFCA profiles, which could mean the NLIP may not receive Federal certification for 100-year flood protection.
- The current evaluation of work needed along the Natomas East Main Drainage Canal could find additional work beyond the scope currently anticipated to achieve 100-year flood protection.
- Federal Aviation Administration approval is required for work around the airport, which could delay execution.
- Legal action from residents and development opposition may occur and could delay completion of environmental documents and permits.
- Projected costs are rising. If local, State and Federal funds are

insufficient to cover these costs, implementation could be delayed.

- Environmental constraints in the permitting process could reduce the construction windows.
- Adequate construction resources may not be available. The volume of work SAFCA is planning to complete each year could put too many construction crews on the ground to be efficient.
- Mobilization and set up for construction could impact actual construction duration by up to two to three weeks.
- Levee construction duration could be reduced by borrow pit development and haul road construction.
- Weather impacts could further reduce the available construction windows.
- Property acquisition could be delayed by property owners not wishing to sell their property or grant easements.

MWH concludes that the current schedule already assumes many acceleration measures and if any of SAFCA's assumptions prove to be invalid or something unforeseen comes up, the work will take longer than anticipated. SAFCA's schedule includes no room for error.

Given the complexity and magnitude of the program, as well as the importance of executing it as quickly as possible, SAFCA and the City have agreed that continued independent review of the program schedule and execution by MWH would be a wise and welcome addition. Accordingly, MWH will participate henceforth in the regular schedule review and adjustment process and independently make its recommendations to SAFCA and the City.

SAFCA is committed to assuring that resource constraints on our NLIP program team do not affect the execution schedule. The team is composed of SAFCA staff supported by consultants, with the capability of quickly adding resources as needed to keep the work on track. The organization of the current NLIP team, and a listing of all of the SAFCA agency and consultant participants are listed in Attachment C.

While many factors are beyond SAFCA's direct control, the agency has a history of working cooperatively and successfully with partner and regulatory agencies to concurrently achieve flood protection and ecosystem restoration goals. In addition, where feasible, SAFCA is augmenting the resources of permitting agencies to expedite the work. The intensive supportive effort and cooperation afforded by staffs of these agencies are critical to the timely completion of the program. I am pleased to acknowledge the extraordinary level of support provided to the program by these staffs.

How big is the flood risk in Natomas, and should the community seek State and Federal declarations of emergency to break through the normal review and permitting processes?

The flood risk in Natomas is unacceptably high for an urban area, which is why SAFCA, with the support of the State and the Corps is expediting the structural improvements to the levee system. However, in comparison to the risks people take in normal daily life, the flood risk in the Natomas Basin is neither imminent nor extreme. Furthermore, as SAFCA has frequently noted, the risk of flooding will be reduced, but never eliminated with SAFCA's proposed levee improvements, so this is a fact of life that must be acknowledged and dealt with on an ongoing basis. It must also be recognized that no amount of data collection and analysis can fully inform us of, or protect us from, hidden perils or unforeseen circumstances which will always be part of life in a deep floodplain protected by levees.

The theoretical calculation of risk recently completed by the Corps includes assumptions about the future probability of storm events, calculations of flow routings through the reservoirs, channels, and bypasses of the Sacramento River Flood Control Project, and modeling of embankment and foundation performance based on extrapolations of geotechnical levee characteristics from drill logs taken at intervals along and adjacent to the levee system. While competently executed and thoroughly reviewed before release, the Corps conclusion that it can not certify the levee system at the 3 percent level does not necessarily alter our historic characterization of the Natomas Basin as high, but not imminent nor extreme.

The following concepts will help frame the flood risk assessment:

a) Flood risk is seasonal and episodic. It is correlated with the magnitude and duration of flood events, which the historic record indicates generally occur from between November and April. Because it takes four to ten days to charge the Sacramento River system to the point where Natomas could be threatened, the flood risk can be anticipated and addressed with adequate lead time and warning, unlike threats such as flash flooding on small streams, tornados, lightning, and other fast-developing events. There will be adequate time to warn the affected community and to evacuate if necessary, prior to the formation of an imminent-risk situation. Unlike New Orleans, Sacramento is not subject to the compounding effects of hurricane winds, and evacuation routes to high ground are comparatively short. Furthermore, both the City of Sacramento and the Counties of Sacramento have prepared extensive emergency response plans for activation in flood emergencies.

b) Due to over $100 million in flood levee improvements expended between 1990 and 1998, the 1997 flood, which can reasonably be characterized as the largest flood event in the last 150 years, caused no significant levee problems for the Natomas Basin. The through-levee seepage which threatened to cause levee failures in the 1986 flood have been effectively controlled with the cut-off walls and seepage berms constructed by the Corps and SAFCA.

c) During the January through April, 2006 high water event, seepage was detected at the Pritchard Lake Pumping Plant and at the junction of the Natomas Cross Canal and the Sacramento River East levee. Both sites have subsequently been remediated to greatly reduce the risk of failure at these sites. In 2007 two critical erosion sites were repaired by the Corps and the State. Although erosion is continuing along the Sacramento River, the Natomas levee system has no identified critical erosion sites at this time.

d) SAFCA's and the Corps analysis indicates that the Natomas levee system would not be overtopped in the event of a 200-year flood event.

e) Although flood patrols and flood fighting can not be considered when making certification decisions, they are certainly an important factor in protecting a levee system. RD 1000 is well prepared for this task, backed up by the State and the Corps.

Taking all these factors into consideration, a reasonable conclusion is that the flood risk in Natomas is unacceptably high, but not imminent or severe, and the risk to human life in the event of a major flood situation can be mitigated in a timely manner through public education, flood warnings, and if necessary, evacuation. The risk to property is lower than it has ever been in the past, and will continue to be reduced, but not eliminated, through SAFCA's proposed levee improvements over the next several year.

Nevertheless, concerned interests have called for a declaration of emergency to cut through the red tape and get equipment rolling. Some have suggested a year of more could be cut from the construction schedule if the normal planning, permitting, design, and construction process were set aside.

Based on currently available information, taking such a drastic course of action would be extremely unwise and likely counterproductive due to a range of potential unintended consequences. I have requested an independent assessment of this issue by Shute, Mihaly and Weinberger, LLP (SMW), which is attached to this report as Attachment D.

As discussed by SMW in its analysis, the condition of the Natomas levees, does not fit the definition of a state emergency, which involves, "conditions of disaster or extreme peril to life, property, and the resources of the State".

The risks involved in invoking governmental authority to cut through the normal project execution process include catalyzing opposition from landowner, taxpayer, civil rights, and environmental advocates. It would likely result in legal challenge, which could further delay the work, rather than speed it up. It would certainly hurt SAFCA's reputation for cooperative and fair execution of its mission, a legacy which has been built over the 19-

year life of the agency.

A State emergency declaration would likely need to be preceded by a local emergency declaration and request for State aid, based on the exhaustion of local resources to deal with the emergency. Such a local declaration of emergency would be inconsistent with the current City decision to continue to issue construction permits until the new FEMA FIRMs become effective in December.

A local and State emergency declaration would be unlikely to significantly speed up execution of the work. While it is difficult to project specifically what tasks will ultimately constrain execution of the program, as has been discussed earlier in this report, the federal permitting process is a major, and perhaps controlling constraint. It is extremely unlikely that a Federal emergency declaration could or would be invoked, so a State declaration would have little or no effect on this process. Nevertheless, to thoroughly explore this issue, MWH has been asked to analyze the specific impacts of a local and State emergency declaration on program execution, assuming none of the unintended consequences materialize.

Conclusion

SAFCA has been expediting the analysis, planning, permitting, design, and construction process for the Natomas Basin since 2004, and will continue to press forward with aggressive execution until it is completed. This work is being completed in parallel with, and in coordination with other projects needed to achieve 200-year level flood protection for the Sacramento Area. With support from the City a great deal of attention is focused on assuring that execution proceeds as quickly as possible and that resources under our control do not hold up the process. While the flood risk will continue to be characterized as high until 100-year level flood protection is achieved, the level of risk is neither imminent nor extreme, and declarations of local and State emergency at this time would be unwarranted, unwise, and unhelpful