

## Delta Flood Management Investment Strategy

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**Requested Action:** The staff requests that the Council approve an additional Delta Flood Management Investment Strategy principle addressing the burden of proof borne by reclamation districts that seek State investments for non-project levees. The proposed principle, held over for further consideration when the Council approved other Delta Flood Management Investment Strategy principles in July, provides that these districts must demonstrate their project's contribution to the protection of people and/or property and the achievement of the coequal goals.

This item also includes an informational update on other activities leading to the development of the Delta Levees Investment Strategy (DLIS). Most notable of these updates is a summary of the independent science review panel's report entitled "Methodology and Scientific Basis to Support the Delta Levee Investment Strategy". The science panel was charged with reviewing the approach and methodology associated with the DLIS. Staff will provide an overview of the panel's comments and suggestions and discuss next steps for addressing these.

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### **Recommendation**

The staff requests that the Council approve an additional Delta Flood Management Investment Strategy principle addressing the burden of proof borne by reclamation districts that seek State investments in non-project levees (levees not part of the State Plan of Flood Control).

If approved, the principle would be added to the Delta Flood Management Investment Strategy Principles that the Council approved in July. Together with implementation considerations, they will guide further work by staff and consultants on the Delta Flood Management Investment Strategy.

### **Background**

At its July meeting, the Council approved a statement of 12 principles and eight implementation considerations to guide next steps in development of the Delta levee investment strategy being developed to implement the Delta Plan's recommendation RR R4 (Actions for the Prioritization of State Investments in Delta Levees). The approved statement of principles and implementation considerations are appended as Attachment 1.

At the time, the Council held over consideration of a single recommended principle addressing the burden of proof borne by landowners whose reclamation districts seek State investments in non-project Delta levees. Non-project levees are not part of State-federal flood protection facilities and are typically privately owned, whereas project

levees are those that are part of the State Plan of Flood Control. The Council directed staff to revise the draft principle, after considering the testimony received and the Council discussion, and return with the revised draft at the August meeting.

**A Revised Delta Flood Management Investment Strategy Principle Addressing the Burden of Proof Borne by Landowners Whose Reclamation Districts Seek State Investments in Delta Levees**

The Delta Flood Management Investment Strategy principle held over at the July meeting provided:

*Owners of non-project levees seeking State funding have the burden to prove that they protect many people and/or assets or help achieve the coequal goals.*

The other principles adopted by the Council at the July meeting identify (a) state interests that should be emphasized in developing levee investment priorities, (b) a comprehensive approach to flood management that complements levee investments with constraints on urbanization of floodprone areas and assessment of nonstructural flood management measures, (c) consideration of post-disaster recovery, and (d) the allocation of levee improvement costs to beneficiaries. The guidance the remaining principle adds to those already adopted addresses who bears the burden of proof to demonstrate that an investment will further the levee investment goals, as articulated in the principles. The remaining principle would assign to landowners, presumably acting through their reclamation districts, the duty of demonstrating how a particular investment aligns with the goals of the Delta Flood Management Investment Strategy.

The Council's discussion about the principle sought further definition of certain terms used in the principle, asking for clarification about how many people and/or assets a levee investment might need to protect. Council member Piepho asked whether the principles or some portion of them should be deferred until the next step of the investment strategy's development when ARCADIS, our consultant, has completed its analysis of data about the lives and assets at stake in alternative levee investments. Judge Damrell urged that the principles should provide general direction rather than adding more specificity now about the principles' application. Council member Tatayon suggested that rather than seeking further definition of the term "many", the Council should focus on the consequences of flooding, which would include the magnitude of damage to lives and property.

After considering the Council's discussion and the testimony received, staff recommends the Council consider a revised principle that provides:

*Reclamation districts seeking State funds for non-project levees have the burden to prove their contribution to the protection of people and/or property and the achievement of the coequal goals.*

In response to the Council member Piepho's concerns and Judge Damrell's advice, the redrafted principle avoids reference to the term "many" or to other descriptions of the magnitude of benefits that must be provided. The principle would provide useful guidance for updating guidelines for programs that provide State funds for Delta levees, explaining the responsibility of reclamation districts to demonstrate how projects proposed for funding further the levee investment priorities that the Council has endorsed. It reinforces practices already used in the review of requests for State funds through the Department of Water Resources' (DWR's) Urban Flood Risk Reduction and Delta Levees Special Projects programs, which require local levee agencies to explain how their projects meet the purposes of those programs' guidelines. Such justifications are, however, not required now for maintenance or rehabilitation of non-project levees through DWR's Delta Levees Subventions Program, for which this would be a new requirement. In the staff's view, applying this principle to only non-project levees may be justified because of the State's mandated responsibilities for maintenance and repair of project levees in the State Plan of Flood Control. This responsibility does not extend to the Delta's non-project levees.

### **Independent Science Review Panel Report Summary**

The Council recently received and posted the report of the independent Scientific Review Panel convened by the Council's Delta Science Program to review ARCADIS' proposed methodology for the DLIS. Attachment 2 is the Panel's report. The charge to the Panel was to review the scientific basis for the methodology developed to date and to provide advice to ensure that the approach taken was transparent, robust, and sufficiently sensitive to quantify and prioritize the assets and risks to State interests associated with each leveed island and tract in the Delta. The Panel met publicly May 19-20 and submitted its report to the Delta Lead Scientist in July.

Currently, Council staff and the ARCADIS team, along with key partner agencies such as DWR, are reviewing the Panel's recommendations and will decide how best to address these using available information and within the time and scope of the project. Any changes to the methodology will be incorporated in the decision-support tool as appropriate. Although no formal response to the Panel report is required, Council staff and the ARCADIS team will document responses to the recommendations so the public can understand what was addressed and why, along with what was not addressed and why.

Overall the Panel considered the "proposed methodology and Planning Tool to have worthwhile potential in assisting the decision-making of investment priorities for levees." "Much effort and work has been done to date, and the development of the methodology and Planning Tool appears to be on a good path going forward." The Panel recognized the advantages of this mid-term review in that it allowed for comments and issues to be recognized and addressed before finalization of the methodology and decision-support tool. This mid-term review occurred without the panel being able to see a demonstration of the decision-support tool. In hindsight, such a demonstration might have more clearly shown how the methodology would be used and provided additional material for the

review. A demonstration also may have answered some of the more basic or fundamental questions the Panel had.

The Panel provided recommendations to be addressed to ensure the methodology is “scientifically sound and ready for application.” The Panel cautioned in the report that addressing these immediate recommendations was necessary to prevent credibility issues in the future use of this methodology.

In their report, the Panel identified seven overarching issues to be addressed as this project moves forward. These issues include the following:

1. Definitions – The Panel suggested better documentation of terms and concepts used in the project and how these terms and concepts would be measured and interpreted. Examples include water supply reliability, tolerable risk, indicators (versus metrics), beneficiaries, and levee rehabilitation. This was suggested to improve the transparency and credibility of the project.
2. Data – The Panel made three suggestions related to data used in development of the methodology:
  - a. Provide evidence that the datasets employed are the most current and best available.
  - b. Identify clear quality assurance/quality control procedures and apply them to all datasets used in the methodology.
  - c. Further develop metadata documenting the datasets. This will build credibility in the methodology and proper interpretation of the results as well as making future updates to the information easier.
3. Uncertainty – The Panel said the methodology should include a clear definition of the types of uncertainty that will be addressed in the analysis, how these uncertainties will be identified and evaluated, and how they will be propagated through the DLIS analysis to assess how they impact the levee prioritization. This clarification will help strengthen the technical basis for the rankings/prioritization and investment strategy recommendations.
4. Aggregation and Scale – The Panel made three suggestions related to the scale of the DLIS methodology:
  - a. Interactions (responses and consequences) among islands, such as simultaneous and concurrent failures of groups of islands, should be considered as part of the methodology.
  - b. The analysis should be expanded to include consideration of regional and national benefits and consequences
  - c. It would be better to devote effort to getting the best estimates for the present situation before expanding the effort to also predict rankings for 2030 and 2050.

5. Risk Methodology – The Panel’s comments on the risk methodology included direction on documentation along with questions and critiques related to vulnerability assumptions, cost estimates, the use of common graphical representations of frequency and cumulative severity (F-N curves), and the use of the U.S. Corps of Engineers’ tolerable risk criterion for dams. Specifically, the Panel’s suggested:
  - a. A description of the approach that is used to estimate island recovery (levee repair and dewatering costs) is needed.
  - b. Defining the vulnerability/fragility of an island by the weakest levee reach on the island is an unconservative (overly optimistic) measure of island vulnerability.
  - c. That if the methodology is going to address the cost of island recovery as part of the expected damages, then considering non-breach damage repair should be part of that cost.
  - d. A more rigorous case needs to be made for the relevance of adopting the Corps of Engineers’ tolerable risk criterion for dams for the DLIS methodology.
  
6. Metrics and Indicators – The Panel felt that the definitions of terms and metrics, and the calculations that result in the reporting of impacts and rankings, should be more comprehensive and quantitative to provide transparency, adequate understanding of the resources at risk, and the impacts of levee failure or benefits of levee investments. In particular, the Panel recommended that there should be inclusion of social resources and vulnerable populations as metrics and quantitative measures of water supply reliability and disruption impacts. They specifically pointed to a lack of sufficient measures related to “Delta as Place”.
  
7. Decision and Planning Tool – Since the Panel was not able to review the decision support tool, they considered the use of the datasets and methodology and their overall potential for informing Delta levee investments in a transparent manner. Their recommendations related to this evaluation included;
  - a. The clear reporting of metrics in their “natural state” (e.g. acres of land converted to habitat) and in terms of any subsequent normalization of the units.
  - b. The ability for users to “drill down” to access information and methodologies used in calculations and results.
  - c. The capacity of the tool to allow for groupings of islands and tracts to examine rankings and investment portfolios that span multiple islands.
  - d. Testing and documentation of codes used for the decision-support tool.
  - e. Engagement of potential users of the decision-support tool to ensure transparency and usability.

## Other Updates

- Outreach and Coordination – Since the last Council briefing, staff has reached out to several stakeholder groups to exchange thoughts on the development of the Strategy, data accuracy, and the proposed methodology. In addition to regularly scheduled interagency coordination, staff met with representatives from the DWR to discuss comments received on the proposed methodology and to coordinate project-related activities. Staff will continue to meet with key stakeholders and technical experts to solicit input on the information being assembled as the project moves toward the analytical work phase.
- CEQA Update – The DLIS CEQA process was officially initiated in late May with release of the Notice of Preparation (NOP) for the EIR. The public review and comment period extended for 35 days through July 1 and two scoping meetings were held on June 30. Fourteen (14) letters were received in response to the NOP. A frequent comment was the request for more detail about the proposed draft DLIS policy in order to make more specific comments about impact areas of concerns. Commenters are interested in understanding the criteria for identifying State interests and prioritizing areas for levee investment. Environmental impact issues raised included concerns for public health and safety related to potential increased flood risk including related to future sea level rise, and concerns that levee improvement or lack of improvement in one location may result in indirect impacts on neighboring levees/islands; and impacts to biological resources, agricultural lands, cultural and recreation resources, and water quality, as well as questions about potential greenhouse gas emissions. Staff is using input from the Scoping process to refine the detailed EIR impact analysis work plan.
- Project Schedule and Milestones – Attachment 3: *Delta Levees Investment Strategy - Project Schedule* is included as a standing item for the DLIS monthly updates.

## Next Steps

- In the coming months, Council staff will facilitate a workshop with Council members to demonstrate the DLIS decision support tool and how the metrics in the tool can be used to identify areas with higher risks to State interests.
- Council staff will facilitate workshops for stakeholders to demonstrate the DLIS tool and its metrics.

**List of Attachments**

- Attachment 1: Revised draft *Delta Flood Management Investment Strategy Principles*
- Attachment 2: Independent Review Report on the Delta Levee Investment Strategy Methodology
- Attachment 3: Delta Levees Investment Strategy - Project Schedule

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