# The SHIBATANI GROUP, INC.

*Climate Change Hydrology, Water Supply Strategic Planning, New Reservoir Development*
*And CVP/SWP Operational Compliance for California's Water Industry*


August 14, 2013


**Robert Shibatani**
[redacted]


**DELIVERED VIA U.S. MAIL**

The Hon. Joseph Byrne, Chairman
California Water Commission
State of California, Resources Building
1416 Ninth Street, Room 1131
Sacramento, California 95814

**Re: Public Benefits – New Regulations and Guidelines**
**Applicant Modeling Consistency**

Dear Chairman Byrne:

Please accept this letter as a follow-up to my previous letters dated October 22, 2012 and February 12, 2013 and the most recent Case Study presentation on the North-of-the Delta Offstream Storage Project (NODOS). I thought the presentation was well done and the informational handouts from the Power Point quite useful. The two "methods" slides provided a good overview of the various tools used and the sequential linkages between various modeling platforms. I would support their use and recommend that you, the Commission institutionalize this somehow.

I am not sure, however, that I agree with the statement made that hydrology and operations are *constants* (e.g., the stated rationale as to why historical hydrology and operations were used). While the results were illustrative, the fact that they were generated based on historical hydrology and current operations and not *future* hydrology and *future* assumed operations detracts somewhat from their legitimacy.

All applicants should remember that the Commission and public will want to see the future benefits of the projects. Sites Reservoir alone identified a 12-year construction period. Future benefits can only be illustrated by the use of future-based analyses, not historic analyses. There is no point in claiming benefits 20 years ahead without using future data and assumptions that reflect that period 20 years into the future. The only way either the Commission or public can confirm that the modeling supports those benefit claims is to match the time periods of both.

Moving forward and I think Commissioner Saracino alluded to this at the meeting; there is still a need to define in more specific terms the various modeling simulations that would be used by all of the applicants that are claiming public benefits in CVP/SWP waterways. How each applicant intends to demonstrate benefits in their own waterbodies over which they have control is one thing (e.g., they can apply their own discretion and methodologies). An example would be SMUD's operation of Union Valley Reservoir. However, where you have common waterways, controlled by a uniform set of established operating rules (e.g., CVP/SWP reservoir release schedules), one has to use a consistent modeling platform and one that is based on changing future hydrology not past hydrology.

I have set out some examples to illustrate these points. Hopefully, these may be able to assist Ajay and his staff best consider how to incorporate such issues into the Guidelines for Public Benefits, perhaps as a useful Appendix.

**1. Standardized CALSIM Run Operational Assumptions**

Using a very simple example, **Table 1** below shows 3 possible new storage projects, each making claims of Ecosystem Benefits over varying time periods in the lower American River.

**Table 1**
**Hypothetical Three Projects**
**Showing Possible Varied Assumptions**

| | Project Online | Claimed Ecosystem Benefit in LAR | Folsom Flood Curve | Assumed Unimpaired Inflow | Water Forum "Wedge" | LAR FMS | Demands from LAR | Temperature Control |
|---|---|---|---|---|---|---|---|---|
| **Project A** | 2018 | $10M by 2030 | 400-600 TAF | 2.4 MAF | Yes | Yes | OCAP 5a | TCD and CPMM and Shutter Reconfigurations |
| **Project B** | 2022 | $50M by 2060 | 400 TAF | 3.2 MAF | No | No | SRWRS | TCD and CPMM |
| **Project C** | 2025 | $25M by 2050 | 400-670 TAF | 2.8 MAF | Partial | Yes | Independent | None |

Notes:
Project Online – the possible year by which project construction would be completed and operations commenced.
Folsom Flood Curve – authorized encroachment curve in the revised Water Control Manual.
*Assumed Unimpaired Inflow – climate adjusted (or not) annual unimpaired inflow into Folsom Reservoir.*
Water Forum "Wedge" – implementation of the Water Forum Agreement dry-year cut-backs for each of the water purveyors signatory to the Water Forum Agreement, as established in their Purveyor Specific Agreements (PSAs).
LAR FMS – Lower American River Flow Management Standard – new flow standard developed by the Water Forum intended to ultimately replace D-893; currently being reviewed by the SWRCB and would require adoption into U.S. Bureau of Reclamation permits for Folsom Dam and Reservoir.
Demands from LAR – annual/seasonal demand patterns for each of the water providers diverting from Folsom Reservoir or the lower American River; the OCAP 5a is the specific modeling run demands used by the U.S. Bureau of Reclamation in their 2005 OCAP; SRWRS represents the same modeling run demands used in the Sacramento River Water Reliability Study; and Independent represents a completely new set of demand assumptions.
Temperature Control – TCD is the temperature control device on the urban water intake; CPMM is the Coldwater Pool Management Model developed during the FAZIO EIS for Sacramento County; Shutter Reconfigurations are the re-ganging of shutters to the power penstocks at Folsom Dam to improve thermal management.

The columns to the right of the Ecosystem Benefits column show what those projects assumed for a few select operational parameters regarding Folsom Reservoir and the lower American River. Just in this one very simplistic example, the difficulty in assessing which of the three projects provides the most effective and best means of achieving the claimed Ecosystem Benefits is demonstrated. The actual suite of assumptions would be several times larger than what is depicted here. The varied nature of the operational assumptions across the three projects makes simple evaluation of the monetized benefits challenging and subject to several questions.

For example, from this table alone, is it possible to determine:

1) Whether Project B is the best, since it assumed the highest unimpaired inflow and did not cut back local purveyor deliveries in dry or "wedge" years under the Water Forum Agreement?
2) Whether Project A should be ranked the lowest based on claimed Ecosystem Benefits since it relied on the lowest unimpaired inflow and assumed a more stringent instream flow standard by assuming implementation of the LAR FMS?

3) Whether Project C should be given more credit since it adopted the most rigid flood control operation for Folsom Reservoir, included the LAR FMS, assumed none of the temperature modifications at Folsom Dam and yet still managed to generate significant Ecosystem Benefits?

From the examples noted above, this is clearly a complex issue and yet one that has significant implications to the Commission, potential project applicants, general public, and the environment.

The kinds of questions identified above are inevitable at some point in this process. On this point there is (or should be) little argument. The only variable is whether we attempt to provide that clarity now so as to reduce such unavoidable concerns or, choose to address all of this at a later date after all project analyses have been completed. Prudence would seem to suggest that taking a more proactive posture and addressing these matters now, while involving some time, could save orders of magnitude more time and costs (to the applicants) down the road.

Our collective goal is to ensure that the Commission and staff have at their disposal the most resilient and effective tools available. I am confident that with ongoing input, the Commission and its staff will continue to exercise its proper discretion and judgment to assure the public that this process is indeed technically, legally, and institutionally appropriate and efficient.

I look forward to continuing to assist the Commission in this regard.

As always, please do not hesitate to contact me if you have any questions or require further enhancement.

Very sincerely yours,

**The SHIBATANI GROUP, Inc.**

Robert Shibatani
CEO & Principal Hydrologist

RS/sj

cc: Sue Sims, Executive Director, California Water Commission
Anthony Saracino, Commissioner, California Water Commission

# The SHIBATANI GROUP, INC.

*Climate Change Hydrology, Water Supply Strategic Planning, New Reservoir Development*
*And CVP/SWP Operational Compliance for California's Water Industry*


May 17, 2013


**Robert Shibatani**
[redacted]


**DELIVERED VIA U.S. MAIL**

The Hon. Joseph Byrne, Chairman
California Water Commission
State of California, Resources Building
1416 Ninth Street, Room 1131
Sacramento, California 95814

**Re: Public Benefits – New Regulations and Guidelines**
**Clarifying Documentation – As Potential Appendices**

Dear Chairman Byrne:

Please accept this letter as a follow-up to my previous letters dated October 22, 2012 and February 12, 2013 regarding various recommendations related to the documentation requirements necessary to best support applications for proposed funding of claimed public benefits associated with new water storage projects. Given that the Commission has additional time to carefully review and reflect on these matters, I have identified below two issues and their recommendations for your consideration.

**1. Normalizing Hydrologic Modeling**

This issue has immediate relevance since several project environmental documents related to these storage projects will be commencing soon (or have already). Accordingly, guidance and/or direction is being sought from the Commission and staff so that project applicants can be assured that: 1) they are incorporating tools, approaches, and analytical assumptions acceptable to the Commission, and 2) an equitable *playing field* exists between all environmental documents through the setting of a uniform set of baseline environmental conditions. As the Commission can appreciate, the costs of preparing such environmental documentation are not insignificant. Project applicants need to assure themselves that whatever they initiate now in their various EIRs and benefits analyses will be consistent with Commission expectations.

As noted in earlier letters, this issue is centered on the fact that all alleged public benefits (e.g., instream ecosystem benefits, water quality dilution benefits, recreational flow benefits, etc.) and related environmental effects of the proposed new storage projects will involve hydrologic modeling. All derived benefits, therefore, will depend on "how" the system is modeled. The importance of "normalizing" that modeling will be essential to ensuring that all projects are compared without inherent bias.

The primary modeling issues include:

1) Climate modeling (e.g., models, assumptions, approaches)
2) Hydrological baseline (e.g., historical, future, period of record)
3) System operational modeling (e.g., CALSIM II, environmental effects models, post-processing)

**Recommendation:**

DWR staff are well versed in these issues. It is only a matter of deciding which of the several modeling options the Commission wishes to adopt. DWR staff could prepare a Modeling Guidance Document that could contain this information from accepted climate change archives (e.g., CMIP5) and current modeling platforms (e.g., CALSIM II) used in other DWR documents. It could replicate the content contained in the Common Assumptions process of several years ago including all

of the pertinent information required to undertake hydrologic modeling. This document could then be publicly reviewed prior to its inclusion as perhaps an Appendix to the final Guidelines. Without such guidance, the Commission and the public have no means of assuring that the review process can equitably compare the benefits claimed by each of the projects.

**2. Developing Public Benefit Valuation Templates**

This issue relates to the manner in which the public benefits and their analyses would be presented in documentation submitted to the Commission. To date, we have heard discussions and seen documentation on the various methods and approaches to identifying, assessing, and quantifying the various public benefit values. However, there currently exists no specific guidance or direction on how this information should be ultimately presented in the documentation submitted to the Commission and/or its independent technical review panel. Without such guidance, applicants would be left to decide on their own how best to demonstrate these benefits. Accordingly, numerous variations would likely come before the Commission.

For example, six projects could claim ecosystem benefits in the lower American River for temperature moderation. Each document would likely provide this information in different ways and the information that would be highlighted (e.g., river location, time period, mean daily/monthly averages, etc.) would likely vary between documents. How will the Commission first cull the comparable information from the documentation? No small task in and of itself. Second, and more importantly, how will it then "normalize" the differences, if it is assumed for example, that one document may use mean monthly averages at Watt and Howe with climate change and another document uses mean daily averages at Nimbus and the mouth without climate change? Which project under this example would demonstrate the greater public benefit? This is merely a simplistic example; in reality many more variables would exist.

**Recommendation:**

To avoid this inconsistency, a standardized template is recommended that would contain all of the relevant information required by the Commission to evaluate equitably and efficiently, each of the claimed public benefits. For example, from the above illustration it could include river reach locations, time period, temperature metric, targeted species, and specific columns for the "base" condition and even the "with/without" climate change conditions. A consistent template form could be developed by staff. All applicants would be asked to follow these templates and include them in their submittal packages.

The reviewers could then easily place each form side-by-side and see quickly, the comparative differences between projects. Not only would such templates significantly reduce the review time required by Commission staff, but it would also markedly improve consistency and elevate overall transparency of the review process.

Thank you in advance for your consideration of this request.

As always, please do not hesitate to contact me if you have any questions or require further enhancement.

Very sincerely yours,

**The SHIBATANI GROUP, Inc.**

Robert Shibatani
CEO & Principal Hydrologist

RS/sj

cc: Sue Sims, Executive Director, California Water Commission

# The SHIBATANI GROUP, INC.

*Climate Change Hydrology, Water Supply Strategic Planning, New Reservoir Development*
*And CVP/SWP Operational Compliance for California's Water Industry*


February 12, 2013


**Robert Shibatani**
**Direct:** [redacted]


**DELIVERED VIA U.S. MAIL**

The Hon. Joseph Byrne, Chairman
California Water Commission
State of California, Resources Building
1416 Ninth Street, Room 1131
Sacramento, California 95814

**Re: Public Benefits – New Regulations and Guidelines Workshops**
**Environmental Document Requirements**

Dear Chairman Byrne:

Please accept this letter as a formal request to appear before your Commission. It is being submitted as a follow-up to my previous letter dated October 22, 2012 (see attached) to then Chairman Saracino regarding various issues and questions related to the environmental documentation requirements necessary to support applications for proposed funding of claimed public benefits associated with new water storage projects.

This matter has immediate relevance since several project environmental documents related to these storage projects will be commencing soon (or have already). Accordingly, guidance and/or direction is being sought from the Commission and staff so that project applicants can be assured that: 1) they are incorporating tools, approaches, and analytical assumptions acceptable to the Commission, and 2) an equitable *playing field* exists between all environmental documents through the setting of a uniform set of baseline environmental conditions. As the Commission can appreciate, the costs of preparing such environmental documentation are not insignificant. Project applicants need to assure themselves that whatever they initiate now in their various EIRs and benefits analyses will be consistent with Commission expectations.

As noted in my earlier letter, this issue is centered on a fundamental reality. And that is, all public benefits (e.g., instream ecosystem benefits, water quality dilution benefits, recreational flow benefits, etc.) and related environmental effects of the proposed new storage projects will involve the modeling/simulation of water resources or the system's hydrology. All derived benefits will depend on "how" the system is modeled. The importance of "normalizing" the many intricate processes, analyses, and assumptions of those anticipated modeling/simulations will be essential to ensuring that all projects are compared without inherent bias.

Without repeating the details of my October 22, 2012 letter, the primary issues include:

1) Climate modeling (e.g., models, assumptions, approaches)
2) Hydrological baseline (e.g., historical, future, period of record)
3) System operational modeling (e.g., CALSIM II, environmental effects models, post-processing)
4) CEQA-related issues (e.g., inclusion of future no-action?)

It is my thinking that such dialogue would perhaps best be facilitated at the upcoming Public Workshops, but I defer completely to the Commission and staff's preference in this regard. If granted permission to appear, the presentation would be informational only. It would not offer or recommend any specific approaches (unless requested by the Commission) but rather simply raise these issues in the hopes that it would engender wider dialogue during the Workshops. Any such presentation would be approximately 15 minutes in length.

Thank you in advance for your consideration of this request.

As always, please do not hesitate to contact me if you have any questions or require further enhancement.

Very sincerely yours,

**The SHIBATANI GROUP, Inc.**

Robert Shibatani
CEO & Principal Hydrologist

RS/sj
Attach. Letter from Robert Shibatani to Anthony Saracino, Chairman, dated October 22, 2012

cc: Sue Sims, Executive Director, California Water Commission

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# The SHIBATANI GROUP, INC.

*Climate Change Hydrology, Water Supply Strategic Planning, New Reservoir Development*
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October 22, 2012


**Robert Shibatani**
**Direct:** [redacted]


**DELIVERED VIA U.S. MAIL**

The Hon. Anthony Saracino, Chairman
California Water Commission
State of California, Resources Building
1416 Ninth Street, Room 1131
Sacramento, California 95814

**Re: California Water Commission**
**Public Benefits – New Regulations and Guidelines**
**Comments on Environmental Document Requirements**

Dear Chairman Saracino:

Please find below select comments submitted to the California Water Commission (the "Commission") related to the pending new Regulations and associated Guidelines regarding public benefits for new water storage projects contemplated under the Delta Reform Act of 2009. These comments, existing as both observations and queries, do not require any formal response but are provided merely for consideration by the Commission and staff. These comments focus on the environmental documents that are required for submission as part of a complete application package (as noted in the Draft Guidelines). It is assumed that the Commission will consider the findings of each environmental document as part of the overall project applicant's proposal. Acknowledging that, as part of the screening criteria for public benefits, a consistent evaluation method is both desirable (offering the best means for comparison between projects) and defensible, the structure, assumptions, and findings of each environmental document will become very important -- for they will form the basis upon which the public benefits will be derived (e.g., instream ecosystem benefits, water quality dilution benefits, recreational flow benefits, etc.).

Climate change or more specifically, its effects on existing State hydrology is now widely accepted. The manner with which it is addressed in environmental documentation reviews will be very important to the Commission. As the Commission has heard on several occasions, climate change *hydrology* can (and likely will) be used to support the objectives of various projects. How climate change is incorporated into those project documents will affect the hydrology that, as noted previously, will serve as the basis for any and all claimed public benefits. A consistent, reasonable, and highly transparent analytical process for the hydrological component, therefore, will help ensure the legitimacy of those claimed benefits. More importantly, it can assure both the Commission and indeed the project applicants, that a level playing field is being implemented in the review of each project.

Climate change or, climate-sensitized hydrology is such a new field of endeavor that the Commission may wish to establish clear parameters and guidelines for those environmental documents that will be prepared in support of individual projects.
If the Commission were simply testing the reasonableness of a *single* project based on new climate-adjusted hydrological analyses (as any other CEQA lead agency), the reasonable threshold would be all that would be necessary. However, the Commission is charged with comparing numerous projects as part of a larger weighting and ranking process. This higher level of responsibility implicitly requires that the Commission take steps to ensure an equitable evaluation process. If one is not possible (since the Commission has no control over what individual agencies will prepare insofar as their environmental documents are concerned), then it would appear that the Commission should at least consider developing counter weighting factors to apply as part of its review process to *balance out* that variability. Otherwise, the process runs the risk of inequitable comparisons.

Recall that most CEQA documents, where tailored, are primarily intended to avoid or offset potential environmental effects. CEQA documents are not however, by design, intended to bolster or *enhance* hydrological response. Without long-

established precedents in predictive future hydrology, potential future scenarios may (and likely will) vary widely between project EIRs. How will the Commission establish or notate which of those project findings are based on low confidence levels, relative to those with a higher degree of confidence, and how will appropriate weighting factors be ascribed to null out inter-project disparity? Climate change, whether it is applied or not, can significantly influence the resulting hydrology in an EIR analysis and, therefore, the claim to public benefits.

Important questions typically arise in the preparation of environmental review documents involving system-wide modeling within relevant CEQA, NEPA, or ESA contexts. To prepare the environmental review documents for which the Commission will ultimately consider, verify, and weigh claimed hydrological (public) benefits, a number of questions are germane to this discussion. From a climate modeling perspective:

- Which of the future based GCM/RCM ensembles will be acceptable to the Commission? Which would not?
- Which of the various bias corrected and spatially downscaled methods will the Commission support?
- Would the Commission accept spatially downscaled climate data *without* bias correction? And if so, under what circumstances?

From a historical hydrology perspective:

- Will the Commission accept analyses that rely on, reference, or apply historical hydrology as a basis for the hydrological evaluation?
- If the Commission accepts historical hydrology as acceptable, what provisos, if any, would it request the project applicants demonstrate? For example, would it accept simple *severity surrogates* based on the historical record as used in the 2010 UWMP Drought Reliability Analyses or, would it require that the temporal pattern of the annual hydrographs be skewed?
- How will the Commission offset the weighting of public benefits claimed by project applicants using historic hydrology (unadjusted for climate change) against those applicants who choose to rely solely on climate-adjusted data?

From a system operational modeling perspective:

- Acknowledging that CALSIM III may be available and in use by the time the Water Bond could come before the voters in 2014, several project documents that would be nearing completion may have already initiated modeling using the current CALSIM II modeling platform – how will the Commission balance that variability between project documents using differing modeling tools, if at all?
- If one accepts that climate change (e.g., increased air temperatures) will affect the upper snow dominated basins, what verifications will the Commission want to see that upper basin runoff and inflow into the CVP/SWP terminal reservoirs have been properly "adjusted" within the system-modeling context? In other words, unimpaired runoff is shifting beyond what long standing modeling assumptions and current modeling code provide – how will the Commission ensure that this base yield is appropriately accounted for and, therefore, the claimed public benefits duly justified?
- Acknowledging that some project applicants may choose a shorter time-step of certain environmental modeling elements (e.g., reservoir coldwater pool) in order to fully capture the total benefit accrued that would otherwise be lost under a monthly time-step – how will the Commission "adjust", if at all, claims made by project applicants for certain public benefits derived under differing time-step analyses?

From a CEQA perspective:

- Will the Commission establish that all project applicants use a consistent and identical CVP/SWP hydrological baseline under the Current Condition? If so, which one will that be?
- Will the Commission request that CEQA documents assume a NEPA posture for the future No-Action compared against the Future Cumulative Condition so that the incremental benefit (or adverse effect) of the project be identified? Under CEQA, no such de-coupling of the proposed project in the future scenario is required. If this de-coupling is not done, however, there would be no way of determining the project's increment benefit in the out years.
- How will the Commission balance uncertainty factors between project environmental documents? What metrics will the Commission request to see in the documents that will allow them to verify confidence levels of the modeled simulations?

- How will the Commission "balance" the true effects of projects where future assumptions for operations differ between projects? For example, two different project EIRs may make separate assumptions for how Folsom Reservoir will ultimately accede to a permanent flood encroachment curve. An American River Basin project that assumes a relaxed curve may claim more instream hydrological benefit than another project elsewhere in the CVP/SWP that takes on a more conservative assumption.
- If the monitoring and reporting requirements currently being considered for the Guidelines have temporal targets (e.g., 5-year) for claimed public benefits, will the Commission require modeled determinations at regular intervals out to the planning horizon? At present, under CEQA, there is no requirement for a sliding scale of incremental temporal impacts from the Base (Current) Condition to the Future Cumulative Condition. In other words, CEQA documents provide for a current and future cumulative condition analysis; it does not require that one consider shorter time intervals to show step-wise increases between those two temporal boundaries. Such *bookending* may be appropriate for CEQA analysis, but may not provide the detail necessary for targeted monitoring of environmental changes as contemplated under the Draft Guidelines.

While many of these questions may appear technical, the authenticity of the environmental review documents will depend on how these questions are ultimately answered. Ensuring an equitable inter-comparison between projects will largely depend on this decisive element. System hydrology is the fundamental basis upon which all public benefits for any proposed project will be derived. It would be valuable for the Commission to both recognize their significance as well as implement the means by which all project applicants will know beforehand, what the Commission will expect to see in the environmental documents.

Two final prescient questions can be identified at this time based on the above discussion. First, whether the Commission will be including in its Guidelines these or similar clarifications to help project applicants structure their environmental review documentation and, at the same time, provide assurances for the applicant that all hydrology-based environmental review will be consistently evaluated. Second, the Commission's anticipated timeline for completing these Guidelines, given that most project-level EIRs on complex water projects take several years to complete.

It is expected that, at least in part, the pending scientific or technical review panel will be able to provide recommendations to the Commission on many of these points. The Commission, however, should be careful not to invest too much reliance on the panel's recommendations. In the end, the overall process and the details that constitute its makeup must be the Commission's and not merely an extension of the panel's viewpoints.

Thank you for the opportunity to provide these comments. I am confident that collectively, the Commission, its staff, resource agency experts, and the public can continue to work closely together to develop a highly effective, equitable, and transparent Guideline document and associated procedure.

As always, please do not hesitate to contact me if you have any questions or require further enhancement.

Very sincerely yours,

**The SHIBATANI GROUP, Inc.**

Robert Shibatani
CEO & Principal Hydrologist

RS/sj

cc: Sue Sims, Executive Director, California Water Commission

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# The SHIBATANI GROUP, INC.

*Climate Change Hydrology, Water Supply Strategic Planning, New Reservoir Development*
*And CVP/SWP Operational Compliance for California's Water Industry*


October 22, 2012


Robert Shibatani
Direct: [redacted]


DELIVERED VIA U.S. MAIL

The Hon. Anthony Saracino, Chairman
California Water Commission
State of California, Resources Building
1416 Ninth Street, Room 1131
Sacramento, California 95814

Re: California Water Commission
Public Benefits – New Regulations and Guidelines
Comments on Environmental Document Requirements

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Climate change or more specifically, its effects on existing State hydrology is now widely accepted. The manner with which it is addressed in environmental documentation reviews will be very important to the Commission. As the Commission has heard on several occasions, climate change *hydrology* can (and likely will) be used to support the objectives of various projects. How climate change is incorporated into those project documents will affect the hydrology that, as noted previously, will serve as the basis for any and all claimed public benefits. A consistent, reasonable, and highly transparent analytical process for the hydrological component, therefore, will help ensure the legitimacy of those claimed benefits. More importantly, it can assure both the Commission and indeed the project applicants, that a level playing field is being implemented in the review of each project.

Climate change or, climate-sensitized hydrology is such a new field of endeavor that the Commission may wish to establish clear parameters and guidelines for those environmental documents that will be prepared in support of individual projects.
If the Commission were simply testing the reasonableness of a *single* project based on new climate-adjusted hydrological analyses (as any other CEQA lead agency), the reasonable threshold would be all that would be necessary. However, the Commission is charged with comparing numerous projects as part of a larger weighting and ranking process. This higher level of responsibility implicitly requires that the Commission take steps to ensure an equitable evaluation process. If one is not possible (since the Commission has no control over what individual agencies will prepare insofar as their environmental documents are concerned), then it would appear that the Commission should at least consider developing counter weighting factors to apply as part of its review process to *balance out* that variability. Otherwise, the process runs the risk of inequitable comparisons.

Recall that most CEQA documents, where tailored, are primarily intended to avoid or offset potential environmental effects. CEQA documents are not however, by design, intended to bolster or *enhance* hydrological response. Without long-

established precedents in predictive future hydrology, potential future scenarios may (and likely will) vary widely between project EIRs. How will the Commission establish or notate which of those project findings are based on low confidence levels, relative to those with a higher degree of confidence, and how will appropriate weighting factors be ascribed to null out inter-project disparity? Climate change, whether it is applied or not, can significantly influence the resulting hydrology in an EIR analysis and, therefore, the claim to public benefits.

Important questions typically arise in the preparation of environmental review documents involving system-wide modeling within relevant CEQA, NEPA, or ESA contexts. To prepare the environmental review documents for which the Commission will ultimately consider, verify, and weigh claimed hydrological (public) benefits, a number of questions are germane to this discussion. From a climate modeling perspective:

- Which of the future based GCM/RCM ensembles will be acceptable to the Commission? Which would not?
- Which of the various bias corrected and spatially downscaled methods will the Commission support?
- Would the Commission accept spatially downscaled climate data *without* bias correction? And if so, under what circumstances?

From a historical hydrology perspective:

- Will the Commission accept analyses that rely on, reference, or apply historical hydrology as a basis for the hydrological evaluation?
- If the Commission accepts historical hydrology as acceptable, what provisos, if any, would it request the project applicants demonstrate? For example, would it accept simple *severity surrogates* based on the historical record as used in the 2010 UWMP Drought Reliability Analyses or, would it require that the temporal pattern of the annual hydrographs be skewed?
- How will the Commission offset the weighting of public benefits claimed by project applicants using historic hydrology (unadjusted for climate change) against those applicants who choose to rely solely on climate-adjusted data?

From a system operational modeling perspective:

- Acknowledging that CALSIM III may be available and in use by the time the Water Bond could come before the voters in 2014, several project documents that would be nearing completion may have already initiated modeling using the current CALSIM II modeling platform – how will the Commission balance that variability between project documents using differing modeling tools, if at all?
- If one accepts that climate change (e.g., increased air temperatures) will affect the upper snow dominated basins, what verifications will the Commission want to see that upper basin runoff and inflow into the CVP/SWP terminal reservoirs have been properly "adjusted" within the system-modeling context? In other words, unimpaired runoff is shifting beyond what long standing modeling assumptions and current modeling code provide – how will the Commission ensure that this base yield is appropriately accounted for and, therefore, the claimed public benefits duly justified?
- Acknowledging that some project applicants may choose a shorter time-step of certain environmental modeling elements (e.g., reservoir coldwater pool) in order to fully capture the total benefit accrued that would otherwise be lost under a monthly time-step – how will the Commission "adjust", if at all, claims made by project applicants for certain public benefits derived under differing time-step analyses?

From a CEQA perspective:

- Will the Commission establish that all project applicants use a consistent and identical CVP/SWP hydrological baseline under the Current Condition? If so, which one will that be?
- Will the Commission request that CEQA documents assume a NEPA posture for the future No-Action compared against the Future Cumulative Condition so that the incremental benefit (or adverse effect) of the project be identified? Under CEQA, no such de-coupling of the proposed project in the future scenario is required. If this de-coupling is not done, however, there would be no way of determining the project's increment benefit in the out years.
- How will the Commission balance uncertainty factors between project environmental documents? What metrics will the Commission request to see in the documents that will allow them to verify confidence levels of the modeled simulations?

- How will the Commission "balance" the true effects of projects where future assumptions for operations differ between projects? For example, two different project EIRs may make separate assumptions for how Folsom Reservoir will ultimately accede to a permanent flood encroachment curve. An American River Basin project that assumes a relaxed curve may claim more instream hydrological benefit than another project elsewhere in the CVP/SWP that takes on a more conservative assumption.
- If the monitoring and reporting requirements currently being considered for the Guidelines have temporal targets (e.g., 5-year) for claimed public benefits, will the Commission require modeled determinations at regular intervals out to the planning horizon? At present, under CEQA, there is no requirement for a sliding scale of incremental temporal impacts from the Base (Current) Condition to the Future Cumulative Condition. In other words, CEQA documents provide for a current and future cumulative condition analysis; it does not require that one consider shorter time intervals to show step-wise increases between those two temporal boundaries. Such *bookending* may be appropriate for CEQA analysis, but may not provide the detail necessary for targeted monitoring of environmental changes as contemplated under the Draft Guidelines.

While many of these questions may appear technical, the authenticity of the environmental review documents will depend on how these questions are ultimately answered. Ensuring an equitable inter-comparison between projects will largely depend on this decisive element. System hydrology is the fundamental basis upon which all public benefits for any proposed project will be derived. It would be valuable for the Commission to both recognize their significance as well as implement the means by which all project applicants will know beforehand, what the Commission will expect to see in the environmental documents.

Two final prescient questions can be identified at this time based on the above discussion. First, whether the Commission will be including in its Guidelines these or similar clarifications to help project applicants structure their environmental review documentation and, at the same time, provide assurances for the applicant that all hydrology-based environmental review will be consistently evaluated. Second, the Commission's anticipated timeline for completing these Guidelines, given that most project-level EIRs on complex water projects take several years to complete.

It is expected that, at least in part, the pending scientific or technical review panel will be able to provide recommendations to the Commission on many of these points. The Commission, however, should be careful not to invest too much reliance on the panel's recommendations. In the end, the overall process and the details that constitute its makeup must be the Commission's and not merely an extension of the panel's viewpoints.

Thank you for the opportunity to provide these comments. I am confident that collectively, the Commission, its staff, resource agency experts, and the public can continue to work closely together to develop a highly effective, equitable, and transparent Guideline document and associated procedure.

As always, please do not hesitate to contact me if you have any questions or require further enhancement.

Very sincerely yours,

The SHIBATANI GROUP, Inc.

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RS/sj

cc: Sue Sims, Executive Director, California Water Commission