

AGENDA  
 IRVINE RANCH WATER DISTRICT  
 ENGINEERING AND OPERATIONS COMMITTEE MEETING  
 TUESDAY, JANUARY 21, 2025

This meeting will be held in-person at the District’s headquarters located at 15600 Sand Canyon Avenue, Irvine, California. The meeting will also be broadcasted via Webex for those wanting to observe the meeting virtually.

To observe this meeting virtually, please join online using the link and information below:

Via Web: <https://irwd.webex.com/irwd/j.php?MTID=m2b76d44c0c2a14a171b3103619028038>  
 Meeting Number (Access Code): 2489 679 9047  
 Meeting password: XBcdKM2tm77

PLEASE NOTE: Webex observers of the meeting will be placed into the Webex lobby when the Board enters closed session. Participants who remain in the “lobby” will automatically be returned to the open session of the Board once the closed session has concluded. Observers joining the meeting while the Board is in closed session will receive a notice that the meeting has been locked. They will be able to observe the meeting once the closed session has concluded.

CALL TO ORDER 1:30 p.m.

ATTENDANCE      Committee Chair:    Daniel Ferons            \_\_\_\_\_  
                          Committee Member: John Withers            \_\_\_\_\_

ALSO PRESENT    Paul Cook            \_\_\_\_\_      Kevin Burton            \_\_\_\_\_      Wendy Chambers \_\_\_\_\_  
                          Neveen Adly            \_\_\_\_\_      Paul Weghorst            \_\_\_\_\_      Steve Choi            \_\_\_\_\_  
                          Jim Colston            \_\_\_\_\_      Jason Manning            \_\_\_\_\_      Jose Zepeda            \_\_\_\_\_  
                          Eric Akiyoshi            \_\_\_\_\_      Malcolm Cortez            \_\_\_\_\_      Jacob Moeder            \_\_\_\_\_  
                          Harry Cho            \_\_\_\_\_      Alex Murphy            \_\_\_\_\_      \_\_\_\_\_  
                          \_\_\_\_\_            \_\_\_\_\_      \_\_\_\_\_            \_\_\_\_\_      \_\_\_\_\_  
                          \_\_\_\_\_            \_\_\_\_\_      \_\_\_\_\_            \_\_\_\_\_      \_\_\_\_\_

PUBLIC COMMENT NOTICE

If you wish to address the Committee on any item, please submit a request to speak via the “chat” feature available when joining the meeting virtually. Remarks are limited to three minutes per speaker on each subject. Public comments are limited to three minutes per speaker on each subject. You may also submit a public comment in advance of the meeting by emailing [comments@irwd.com](mailto:comments@irwd.com) before 8:00 a.m. on Tuesday, January 21, 2025.

---

**COMMUNICATIONS**

---

1. Notes: Burton
2. Public Comments
3. Determine the need to discuss and/or take action on item(s) introduced that came to the attention of the District subsequent to the agenda being posted and determine which items may be approved without discussion.

---

**ACTION**

---

4. TECHNICAL SERVICES AGREEMENT WITH USGS FOR SEISMIC MONITORING – MOEDER / BURTON

Recommendation: That the Board authorize the General Manager to execute a Technical Services Agreement with United States Geological Survey in the not-to-exceed amount of \$238,911 for a five-year term for the development, maintenance, and hosting of Irvine Ranch Water District’s ShakeCast network.

---

**OTHER BUSINESS**

---


5. Directors’ Comments
6. Adjournment

\*\*\*\*\*  
Availability of agenda materials: Agenda exhibits and other writings that are disclosable public records distributed to all or a majority of the members of the above-named Committee in connection with a matter subject to discussion or consideration at an open meeting of the Committee are available for public inspection in the District’s office, 15600 Sand Canyon Avenue, Irvine, California (“District Office”). If such writings are distributed to members of the Committee less than 72 hours prior to the meeting, they will be available from the District Secretary of the District Office at the same time as they are distributed to Committee Members, except that if such writings are distributed one hour prior to, or during, the meeting, they will be available electronically via the Webex meeting noted. Upon request, the District will provide for written agenda materials in appropriate alternative formats, and reasonable disability-related modification or accommodation to enable individuals with disabilities to participate in and provide comments at public meetings. Please submit a request, including your name, phone number and/or email address, and a description of the modification, accommodation, or alternative format requested at least two days before the meeting. Requests should be emailed to [comments@irwd.com](mailto:comments@irwd.com). Requests made by mail must be received at least two days before the meeting. Requests will be granted whenever possible and resolved in favor of accessibility.

January 21, 2025

Prepared by: J. Moeder

Submitted by: K. Burton

Approved by: Paul A. Cook 

ENGINEERING AND OPERATIONS COMMITTEE

TECHNICAL SERVICES AGREEMENT WITH  
UNITED STATES GEOLOGICAL SURVEY FOR SEISMIC MONITORING

SUMMARY:

IRWD's Dam Safety Program includes monitoring seismic activity in the region to inform the District's response post seismic events. Staff collaborated with United States Geological Survey (USGS) on an agreement where USGS will develop, maintain, and host a ShakeCast network to enhance IRWD's seismic monitoring capabilities for a not-to-exceed amount of \$238,911 over a five-year term. Staff recommends that the Board authorize the General Manager to execute a Technical Services Agreement with USGS for the development, maintenance, and hosting of IRWD's ShakeCast network.

BACKGROUND:

IRWD's Dam Safety Program currently uses ShakeMap to monitor seismic activity in the region of IRWD's dams. ShakeMap is a tool developed by USGS that utilizes a network of seismic recording instruments to ground-truth the accelerations in the area of the seismic event to then project the perceived ground motion intensity and estimate the potential damage. While this publicly available network has worked well for IRWD, ShakeCast, which is also a USGS developed tool, is the next level of monitoring that allows for the user to create specific notification thresholds, automatic notifications to user defined recipients, and post-earthquake situational awareness. One specific area of enhancement from IRWD's existing seismic monitoring process is that it eliminates the need for engineering staff to review and interpret ShakeMap data immediately after triggering seismic events and instead relies on the ShakeCast system to process the seismic data, determine if it meets user defined thresholds, and automatically notify recipients on the distribution list. Owners of critical infrastructure, such as California Department of Transportation and the Port of Long Beach, use ShakeCast for seismic monitoring of their critical facilities.

In January 2024, staff started exploratory discussions with USGS regarding using their services to develop, cloud-host, and maintain a ShakeCast network for IRWD. The ShakeCast network will initially focus on IRWD's six dams and may be expanded to include other critical facilities at IRWD such as infrastructure at Michelson Water Recycling Plant and other IRWD facilities that may pose a perceived seismic risk. Staff and IRWD's legal counsel have reviewed the Technical Services Agreement, which is included as Exhibit "A".

FISCAL IMPACTS:

The term of the agreement is for five years and requires IRWD to pay USGS a not-to-exceed amount of \$45,000 per year with a 3% per year escalation. The expenditures for this agreement

will be charged to the operating budget. The total expenditures at the end of the five-year term is in the not-to-exceed amount of \$238,911.

ENVIRONMENTAL COMPLIANCE:

This item is not a project as defined in the California Environmental Quality Act (CEQA) as authorized under the California Code of Regulations, Title 14, Chapter 3, Section 15378.

RECOMMENDATION:

That the Board authorize the General Manager to execute a Technical Services Agreement with United States Geological Survey in the not-to-exceed amount of \$238,911 for a five-year term for the development, maintenance, and hosting of Irvine Ranch Water District's ShakeCast network.

LIST OF EXHIBITS:

Exhibit "A" – Technical Services Agreement between IRWD and USGS

## TECHNICAL ASSISTANCE AGREEMENT

This Technical Assistance Agreement (“**Agreement**”) is entered into by and between U.S. Geological Survey (“**USGS**”), a Bureau of the Department of the Interior, through the offices of its Geologic Hazards Science Center, Golden, Colorado, hereinafter referred to as the “**USGS**” and Irvine Ranch Water District, Irvine, California, hereinafter referred to as “**IRWD**.” USGS and IRWD are sometimes herein referred to as a “**Party**” and collectively as the “**Parties**.”

Whereas the USGS is authorized to perform technical assistance with other Federal agencies, units of State or local government, industrial organizations, private corporations, public and private foundations, and nonprofit organizations (including universities) under the Stevenson-Wydler Act (15 U.S.C. § 3710a(b)(3)(A), as amended).

Whereas the USGS, and, in particular, its Natural Hazards Mission Area, provides alerts and warnings of geologic hazards, the National Earthquake Information Center, specifically has in its mission to provide actionable earthquake information on shaking and potential impact for critical users.

Whereas, IRWD has critical facilities that are potentially exposed to earthquake shaking and has the need of USGS expertise in rapid shaking assessments.

Whereas the project entitled "**ShakeCast Support for Irvine Ranch Water District**" is intended by the Parties to be mutually beneficial and to benefit the people of the United States.

Now, therefore, the Parties hereto agree as follows:

- 1. Statement of Work.** The statement of work is attached as Exhibit “A”. Under the statement of work, the USGS shall, among other things, create and operate an individual ShakeMap software application, called a ShakeCast “**Production Instance**,” which will be configured and customized for IRWD’s facilities, personnel, and desired notification content and will send IRWD’s users notifications. USGS shall also create a “**Backup Instance**,” which will consist of a mirrored copy of IRWD’s Production Instance such that if there is failure in the Production Instance then the backup can be activated. Together the Production Instance and Backup Instance, hereinafter referred to as the “**Instance**.”
- 2. Principal Investigator.** The USGS principal investigator (“**PI**”) for this project is Dr. David Wald, (303) 273-8441, wald@usgs.gov, 1711 Illinois St, Golden, CO. The PI for IRWD is Kevin Burton, P.E., (949) 453-5594, Burton@irwd.com, 15600 Sand Canyon Avenue, Irvine, California 92618. If a PI is unable to continue in this project, his sponsoring agency will make every effort to substitute a replacement acceptable to the other Party.
- 3. Title to Equipment.** There will be no joint property purchased because of the work outlined in the SOW. Each Party will provide its own equipment necessary to support its participation in the technical assistance. ShakeMap (and thus ShakeCast) utilize openly available seismic stations

maintained by other institutions. If IRWD installs and maintains openly available seismic stations, they too, would be available for ShakeMap.

4. **Term.** The technical assistance contemplated by this Agreement will commence on the effective date of this Agreement. The effective date of this Agreement shall be the date of the last signature by the Parties. The expiration date of this Agreement shall be five years from the last date of signature. The Agreement may be extended by mutual written agreement of the Parties for up to five additional years, in five-year increments, with each increment requiring mutual written agreement of the parties.

5. **Funding.**

(a) IRWD shall pay USGS an amount not to exceed \$45,000 annually, which amount will be increased by three percent each year on the anniversary of the effective date. USGS costs consist of (i) cloud-computing charges, (ii) personnel salaries for ShakeCast configuration, maintenance, and software and IT updates, (iii) personnel time for communications with IRWD concerning system configuration, testing, generating scenarios, and post-earthquake response, and (iv) USGS project management and overhead.

(b) The USGS does not require an advance.

(c) This agreement has been negotiated to be paid based on expenses incurred. The USGS will submit quarterly invoices to IRWD's administrative contact, identified in Article 9. Invoices not paid within 30 days of billing will bear Interest, and other fees required by Federal Law, at the annual rate pursuant the Debt Collection Act of 1982, (codified at 31 U.S.C. § 3717) established by the U.S. Treasury.

6. **Termination.** This Agreement may be terminated by either Party on 30 days written notice to the other. In the event of an early termination, the USGS shall be reimbursed for any completed work or work in progress on the “**Effective Date of Termination**” (i.e., when the Agreement terminates following the receipt of written notice from the other Party). Any unspent advanced funds will be returned to IRWD. The USGS shall also supply a copy of the IRWD ShakeCast Instance completed as of the Effective Date of Termination in the event of an early termination of the project.

7. **Publications/Reports.**

(a) Each Party is free to publish the non-proprietary or non-confidential information and data developed in the performance of this agreement. Before a Party submits the information and data for publication or otherwise intends to publicly release or disclose scientific information and data that is jointly developed, the Party shall have a review period of fifteen (15) business days to ensure that the draft publication or presentation does not contain Confidential or Proprietary Business Information. Upon expiration of the review period with no comments received from the other Party, the first Party will proceed with submission of the publication and presentation. The 15 days review period is provided as a courtesy to review the publications or presentations to ensure confidential or proprietary information is not disclosed and ensure that there is not inadvertent release of such information that could be used for a patent or invention application. All comments provided within the review period will be

forwarded to the contacts identified in Section 9. The Parties acknowledge that USGS is required to provide timely public access to the results of scientific information and data that does not contain sensitive protected information. This may include using machine-readable and open formats, data standards, and [metadata](#) for all new non-protected information created and collected in accordance with USGS Fundamental Science Practice regarding the review, approval and release of information set out in [Survey Manual Chapter 502.4 and 502.8, Fundamental Science Practices: Metadata for USGS Scientific Information Products Including Data](#), 502.7 and OMB M-13-13

- (b) Under the authority of 15 USC § 3710a (c)(7)(B), as amended, the Parties will have the opportunity, as part of the technical assistance, to identify protected research and development information, which is defined as information generated by the research which would have been proprietary information had it been obtained from a non-Federal entity. Each Party may designate as protected research and development information, any information generated by its own employees, and with the Agreement of the other Party, designate any information produced by the other Party's employees. Such protected research and development information shall be exempt from disclosure under 5 USC § 552(b)(4). After the protected research and development information period has expired, the USGS may publish the results of the research as part of open literature (journal and proceeding articles) or as USGS open file reports.
- (c) Generated information and results which have been created and marked as protected research and development information may be protected from release or disclosure for a period of two (2) years, unless an earlier date is agreed upon by the Parties.

#### **8. Proprietary Information/Intellectual Property/Background Intellectual Property.**

- (a) **“Proprietary Information”** means information which embodies trade secrets developed at private expense outside of this Agreement or which is confidential technical, commercial, or financial information under the Freedom of Information Act 5 U.S.C. § 552(b)(4).
- (b) All rights in intellectual property, which are defined as new/improved patents, copyrights, new inventions, patentable discoveries, biological materials, or software, created during the SOW, shall be the property or joint property of the organization employing the respective individual who made the invention or discovery. Any such inventions (**“subject inventions”**) shall be reported to the Principal Investigator within 60 days of creation, who in turn will notify their own management and the other Party's Principal Investigator. If the intellectual property is a joint invention not described in paragraph (b) below, the Parties agree to meet and negotiate a commercialization plan within 60 days of the receipt of a written request from the other Party.
- (c) For purposes of this Agreement, background intellectual property refers to intellectual property, which was in existence prior to or first produced outside of this Agreement and was developed by a Party either alone or with others, using one or more separate funding sources not related to the Agreement. Background intellectual property is not considered a subject invention. In this Agreement, IRWD is providing valuable patented/copyrighted material specified in the SOW which the USGS may/could value. If the joint efforts of the Parties build upon the preexisting background intellectual property of IRWD, IRWD may take ownership of the patent/copyright but must agree to negotiate a Government Purpose license or revenue sharing arrangement with the USGS that reflects USGS's contributions to the joint project.

9. **Notices.** Any notice required to be given or which shall be given under this Agreement shall be in writing and delivered by first-class mail to the Parties as follows:

**USGS:**

**Technical:**

Dr. David Wald  
USGS Denver Federal Center  
P.O. Box 25046 MS 966  
Denver, CO 80225  
wald@usgs.gov  
(303) 273-8441

**Administrative:**

USGS Denver Federal Center  
P.O. Box 25046 MS 966  
Denver, CO 80225

DUNS

[www.usgs.gov](http://www.usgs.gov)

**IRWD:**

**Irvine Ranch Water District Contract  
Representative:**

Kevin Burton, P.E.  
15600 Sand Canyon Avenue  
Irvine, California 92618  
[Burton@irwd.com](mailto:Burton@irwd.com)  
(949) 453-5594

10. **Independent Entity.** For purposes of this Agreement and all research and services to be provided hereunder, each Party shall be, and shall be deemed to be, an independent Party and not an agent or employee of the other Party. Each Party shall have exclusive control over its employees in the performance of the work. While in field locations, a Party's employees shall adhere to the safety and technical requirements imposed by the Party controlling the work site.

Neither Party shall have authority to make any statements, representations, or commitments of any kind, or take any action, which shall be binding on the other Party, except as may be explicitly provided for herein or authorized in writing. Neither Party may use the name of the other in advertising or other forms of publicity without the written permission of the other.

11. **Governing Law/Liability.**

(a) This Agreement is subject to interpretation under applicable State and Federal laws. Where there is inconsistency between the laws, Federal law is controlling. Each Party agrees to be responsible for the activities, including the negligence, of their employees. The USGS's responsibility for the payment of claims for loss of property, personal injury, or death caused by the negligence or wrongful act or omission of a USGS employee, while acting within the scope of their employment, is limited to provisions of the Federal Tort Claims Act, 28 USC §§ 2671-80.

(b) The USGS and IRWD make no express or implied warranty as to the conditions of the research, merchantability, or fitness for a particular purpose of the research, data, or resulting



product incorporating data developed and exchanged under the SOW. These provisions shall survive the termination of the Agreement.

- (c) The USGS shall not indemnify IRWD or any third party against any liabilities, costs, attorney's fees, expenses, damages, and losses (including any direct, indirect or consequential losses, loss of profit, loss of reputation and all interest, penalties, and legal costs and all other professional costs and expenses suffered or incurred by Collaborator or any third party arising from the work conducted under this technical assistance agreement.

12. **Force Majeure.** Neither Party shall be liable for any unforeseeable event beyond its control, not caused by the fault or negligence of such Party, which causes such Party to be unable to perform its obligations under this Agreement, and which it is unable to overcome by the exercise of due diligence including, but not limited to, flood, drought, earthquake, storm, fire, pestilence, lightning, and other natural catastrophes; epidemic, war, riot, civil disturbance, or disobedience; strikes, labor disputes, or failure, threat of failure, or sabotage; or any order or injunction made by a court or public agency. In the event of the occurrence of such a force majeure event, the Party unable to perform shall promptly notify the other Party. It shall further use its best efforts to resume performance as quickly as possible and shall suspend performance only for such period as is necessary as a result of the force majeure event.

13. **Entire Agreement.** This Agreement contains all the terms of the Parties and supersedes all prior Agreements and understandings related thereto. This Agreement can be changed or amended only by a written instrument signed by the Parties. Due to the specialized nature of the work, this Agreement is non-assignable by both Parties.

14. **Disputes.** The signatories to this Agreement shall expend their best efforts to amicably resolve any dispute that may arise under this Agreement. Any dispute that the signatories are unable to resolve shall be submitted to the Director of the USGS or his/her designee and the General Manager of IRWD or his/her designee for resolution. If no resolution is reached, the parties agree that the courts of the United States shall have jurisdiction over any claims arising out of work under this agreement.

15. **Miscellaneous Provisions.**

(a) **Anti-Deficiency Act.** Pursuant to the Anti-Deficiency Act, 31 U.S.C. §§ 1341 (a)(1)(A) and (B) and 31 USC § 1517(a), nothing herein contained shall be construed as binding the USGS to expend in any one fiscal year any sum in excess of its appropriations or funding in excess or what it has received for the collaborative work outlined in the SOW or involving the Federal government in any obligation to pay money before funds have been appropriated for that purpose unless otherwise allowed by law.

(b) **Import/Export.** The use and dissemination of information and materials exchanged under this Agreement will be in accordance with all U.S. laws and regulations, including those pertaining to national security and export control. Nothing in this Agreement shall be construed as a license to export information or to permit any disclosure in violation of law, regulation, or Department of Interior policy. The exporting Collaborator is responsible for obtaining any export licenses that may be required by U.S. Federal law.

(c) **Third Parties.** The Parties acknowledge and agree to allow disclosure of Proprietary Information or Background Intellectual property to third parties (such as, students, contractors, subcontractors and or consultants) or external collaborators for the purposes of carrying out this Agreement. If a Party engages a new third party to perform any portion of the SOW after the Effective Date of this Agreement, such Party will notify the other Party and provide information about the third-Party involvement within 7 days of engagement. However, these participants are not Parties to the Agreement. The Parties agree that they will comply with and advise any third parties they have engaged to conduct the Agreement activities to comply with, all applicable Executive Orders, statutes, and regulations. The Parties agree that they will ensure that third party participants are under written obligation not to disclose Proprietary Information or Background Intellectual Property, except as required by law or court order, before the third parties have access to any Proprietary Information or Background Intellectual Property. No foreign personnel shall be engaged by IRWD as a contractor, consultant, grantee or third-party collaborator for the performance of any work under this TAA without first identifying the individual, his country of origin, and the work to be performed to USGS so that USGS may determine whether the agency requires advanced approval by an authorized agency official before working with the foreign contractor, consultant, grantee or third-party collaborator, and whether any data, technology or products shared with or used by a foreign contractor, consultant, grantee or third-party collaborator as part of the technical assistance under this agreement are in accordance with all U.S. laws and regulations, including national security export controls and U.S. Department of State regulations and policies.

(d) The Exhibits, Forms, or Special Terms requested by IRWD are accepted to the extent that such terms do not conflict with applicable Federal laws and regulations.

16. **Survivability.** The following provisions shall survive the termination of this Agreement: 7. Publications/Reports, 8. Intellectual Property and Background Intellectual Property and 14. Disputes.

IN WITNESS WHEREOF, the Parties have caused this Agreement to be executed on the last date listed below.

U.S. GEOLOGICAL SURVEY

Irvine Ranch Water District

By: \_\_\_\_\_

By: \_\_\_\_\_

Name: Dr. Ryan D. Gold

Name: \_\_\_\_\_

Title: Geologic Hazards Cost Center Director

Title: \_\_\_\_\_

Date: \_\_\_\_\_

Date: \_\_\_\_\_

## Exhibit A: Statement of Work

### I. Background

The U.S. Geological Survey (“USGS”), under the auspices of the Advanced National Seismic System (“ANSS”), provides a variety of post-earthquake information products. ShakeCast is one such product. ShakeCast is software developed and managed by the USGS to facilitate automatic use of ShakeMap for critical facilities and utilities for their post-earthquake situational awareness and decision making. ShakeCast is nonproprietary and exists in the public domain. When a potentially damaging earthquake occurs, utility and other lifeline managers, emergency responders, and other critical users have an urgent need for information about the impact on their facilities, so they can make appropriate decisions and take quick actions to ensure safety and restore system functionality. Building off the ShakeMap system, ShakeCast is a fully automated system for retrieving specific information from ShakeMap products and sending it to critical users and triggering established post-earthquake response protocols. ShakeCast allows utilities, transportation agencies, and other large organizations to automatically determine the shaking value at their facilities, set thresholds for notification of inspection priorities (or damage levels; typically damage unlikely, moderate, or serious) for each facility, and then automatically notify (via cell phone or email) staff within their organizations who are responsible for those facilities so they can prioritize their response.

Since the shaking pattern is complex and the vulnerability of infrastructure varies greatly, ShakeCast can greatly increase the accuracy of post-earthquake inspection prioritization over simplified approaches. Irvine Ranch Water District (“IRWD”) is a prime candidate for deploying ShakeCast for quick evaluation of the seismic intensity at their facilities. IRWD has a total of six dams, five of which are large earth embankment dams and considered extremely high hazard by the California Department of Water Resources, Division of Safety of Dams. IRWD will initially utilize the existing ShakeMap instrumentation, combined with IRWD ShakeCast to estimate seismic shaking levels at each of its six dams. In the future, IRWD intends to expand the use of the IRWD ShakeCast instance to also monitor other critical IRWD facilities which may include water, sewage, and recycled water treatment facilities.

Recent advances in cloud-hosting and ShakeCast software improvements have made implementation and operation of ShakeCast less onerous. Yet, for a robust 24x7 operation of such a critical notification system, some significant technical in-house expertise is required by the user, and staff must be always available and aware of technical problems that typically come with operating any such system. As such, several critical users, including the U.S. Nuclear Regulatory Commission (“USNRC,” for NPPs) and the Veteran’s Administration (“VA,” for hospitals) both outsourced operations of their ShakeCast instance by funding USGS directly to operate (“host”) their respective ShakeCast systems in the USGS internal cloud computing environment. USGS provides alerts to interested NRC and VA personnel and provides interactions on the use of the system for real earthquakes, planning scenarios and overall system configuration.

## **II. Purpose**

USGS will host and maintain an operational ShakeCast Production Instance and Backup Instance for IRWD and provide guidance on its usage.

## **III. Objectives or Specific Aims**

The IRWD ShakeCast instance will be operated by USGS. It will provide alerts for all earthquakes relevant to IRWD, as defined by IRWD, and sent as ShakeCast reports via email to a list of IRWD recipients. USGS will also provide general troubleshooting and maintenance for IRWD ShakeCast, provide guidance on the use of ShakeCast, and provide earthquake scenarios for system testing and planning exercises.

## **IV. Term and Proposed Project Schedule/Milestones**

The USGS-hosted IRWD ShakeCast system will be fully operational and tested within 7 days of approval of this agreement.

## **V. IRWD's Expertise and Role**

IRWD's Point of Contact (“**POC**”) will be familiar with IRWD's emergency response needs and facilities. The POC will be aware of the overall benefits and limitations of the ShakeCast system through hands-on use of the product, and through review of USGS-developed documentation for ShakeCast. The collaboration POC will:

- Be the primary POC for USGS/ IRWD ShakeCast communications.
- Provide approval of the USGS-hosted ShakeCast instance after initial set up and when upgrades are performed.
- Provide feedback on draft versions and approval of final versions of USGS-developed system administrator and user guides.
- Provide feedback to the USGS ShakeCast team after significant earthquakes experienced.
- Maintain IRWD facility and fragility data, user information, and notification groups including threshold and geographic polygon settings.

## **VI. USGS' Expertise and Role**

- Implement USGS-hosted IRWD ShakeCast system (“**Instance**”) in the USGS cloud.
- Integrate new free-field seismic monitoring instruments that IRWD adds to its dams or critical infrastructure into the USGS seismic network and thus ShakeMap and IRWDs ShakeCast instance.
- Provide delivery of ShakeCast notifications and products (ShakeCast Reports) to IRWD designated personnel.
- Provide follow-up and guidance concerning timeliness and content of the messages following significant earthquakes.

- Provide maintenance, troubleshooting, upgrading, and configuration of the IRWD ShakeCast instance(s) for IRWD.
- Provide the technology and hosting infrastructure (server hardware, networking, software operating system, etc.) to host the IRWD ShakeCast instance, and keep technology infrastructure patches current.
- Temporarily host and maintain a testing environment for new releases of ShakeCast when new versions of the solution become available for evaluation by IRWD.
- Provide guidance on the use of ShakeCast for IRWD users.
- Help IRWD with ShakeMap/ShakeCast earthquake scenarios, as requested, with scenarios delivered from the existing USGS ShakeMap scenario collections or developed for the State of California.
- Provide a quarterly email report to IRWD POC summarizing events statistics, notifications, and system uptime of the IRWD ShakeCast instance during that quarter.
- Maintain current end-user and system administration documentation for the ShakeCast system, including system administrator and user guides, and provide custom versions of documentation for IRWD ShakeCast users.
- At any time during this agreement, or at its conclusion, facilitate IRWD hosting their own ShakeCast instance. USGS will package up a fully functional ShakeCast software instance in a Docker (or other suitable) container that can be executed as is. Such an instance will replicate the customized setup that USGS was running for IRWD up to that point. USGS will provide IRWD instructions for implementing and running the ShakeCast instance locally.

## **VII. Other Collaborative Activities**

Collaboration between USGS and IRWD may at times include development of enhancements for Shakecast as one-off, project-based requests by IRWD. Such enhancements will require definition of scope and cost separate from the responsibilities outlined above for this Technical Assistance Agreement, and the IRWD Contract Representative must approve any additional costs to IRWD for enhancements in advance of development and delivery. Enhancements will only be considered where it's determined by both parties that these features will benefit IRWD and other organizations using the ShakeCast product. It's not IRWD's intent that a custom instance of ShakeCast be developed for IRWD, so any IRWD-requested enhancements that are agreed upon will be made to the publicly available ShakeCast product. If IRWD begins real-time monitoring of their facilities that are not free-field (that is, structural monitoring seismometers that do not go into ShakeMap) additional discussion and project scoping will be required to incorporate such sensors into the IRWD ShakeCast Instance.

Note: This page is intentionally left blank.