

AGREEMENT FOR PROFESSIONAL CONSULTING SERVICES

THIS AGREEMENT is entered into between Washoe County, a political subdivision of the State of Nevada ("County") and HDR Engineering, Inc. ("Consultant"), collectively (the "Parties").

WITNESSETH:

WHEREAS, County desires to engage Consultant to render certain consulting services in Support of the "Preparation of Emergency Action Plan (EAP) for Washoe County's High Hazard Dams for 1) North Spanish Springs Sediment Basin & update EAP for Spanish Springs Flood Detention Basin Project; 2) Herman Dam; 3) Sierra Sage Pond at the Sierra Sage Golf Course; and 4) Huffaker Effluent Storage Reservoir" (the "Project"); and

WHEREAS, County requires certain professional services in connection with the Project, as described in **Exhibit "A", Scope of Work** (the "Services"); and

WHEREAS, Consultant represents that it is duly qualified, ready, willing and able to provide the Services by virtue of its education, training and experience; and

NOW, THEREFORE, in consideration of the mutual promises contained herein, the Parties agree as follows:

ARTICLE 1 - EFFECTIVE DATE

The effective date of this Agreement shall be June 20th, 2017.

CONSULTANT shall begin performance of services as provided herein upon notice to proceed and shall complete all Services identified in Exhibit A, Scope of Work in accordance with the Standard of Care as set forth in Article 5 herein no later than June 20th, 2018, unless this Agreement is terminated sooner in accordance with its terms.

ARTICLE 2 - SERVICES TO BE PERFORMED BY CONSULTANT

Consultant agrees to perform and complete all Services identified in Exhibit A, Scope of Work under this Agreement, and any amendment thereto in accordance with the Standard of Care as set forth in Article 5 herein. Consultant shall be responsible for the quality, technical accuracy, completeness and coordination of all reports, information, specifications and other items and services furnished under this Agreement and any amendments hereto. County reserves the right to inspect, comment on, and request revision of, all Services identified in Exhibit A and any amendments thereto performed by Consultant prior to acceptance.

Failure to provide major deliverables, including, but not limited to, Services identified in Exhibit A, Scope of Work, shall constitute a material breach of this Agreement, unless waived in writing by the County.

ARTICLE 3 - COMPENSATION

3.1 Compensation for Services

For Services defined in Section 1 above, Consultant's compensation shall be determined on a time and material basis, in accordance with the **Fee Schedule described in Exhibit "B"**, which is attached hereto and incorporated by reference as part of the Agreement, and shall not exceed the sum of **\$164,447.00**. Consultant shall satisfy its obligations hereunder without additional cost or

expense to County during the term of this Agreement other than the heretofore stated compensation and the fee schedule described in Exhibit B. The Fee Schedule may be renegotiated at the end of one (1) year upon request by either the County or the Consultant. Renegotiated fees are subject to approval by County's Board of County Commissioners. The actual costs charged for the work by Consultant in accordance with this provision shall be full compensation to Consultant for all Services and duties required by the Scope of Work, including, but not limited to: costs of supplies, facilities and equipment; costs of labor and services of employees, consultants and sub-consultants engaged by Consultant; travel expenses, telephone charges, typing, duplicating, costs of insurance, and all items of general overhead. Consultant shall submit billings on a monthly basis.

3.2 Compensation for Additional Services

If County requests Consultant to perform additional services, other than those required to be performed under Services identified in Exhibit A, Scope of Work, the cost of such additional services shall be determined prior to commencing additional work. All additional services and amount of payment must be authorized in writing by County prior to commencing any work for such services.

3.3 Methods and Times of Payment

Consultant shall submit to County monthly progress invoices indicating the number of hours each employee provided services and other allowed direct expenses. Payment to Consultant for work on the Project shall be made within thirty (30) days after receipt and approval of Consultant's invoice, said approval not to be unreasonably withheld. Payment by County of invoices or requests for payment shall not constitute acceptance by County of work performed on the Project by Consultant. No penalty shall be imposed upon the County for payment(s) received by Consultant after forty-five days.

3.4 Dispute of Work

County shall notify Consultant in writing within thirty (30) days of receipt of the work, or portion of work, which is not approved. For work, or portions of the work, which are unapproved, the County and Consultant shall develop a mutually acceptable method to resolve the dispute within thirty (30) days of receipt by the Consultant of notice from the County. If the County and Consultant cannot reasonably agree to remedy the dispute of unapproved work within the thirty-day period, the work shall be terminated or suspended per Article 12.

ARTICLE 4 - TIME SCHEDULE FOR COMPLETION

The Services identified in Exhibit A, Scope of Work on the Project shall be diligently performed and be completed no later than June 20th, 2018. Consultant shall be granted time extensions for items within the phases of the Project in writing by County if the time schedules cannot be met because of delays beyond Consultant's reasonable control, including, but not limited to, County's failure to furnish information, or to approve or disapprove Consultant's work promptly. Consultant will provide to County a monthly report including a schedule identifying progress or work completed, problems or difficulties being encountered, work to be initiated during the following month and other useful information. This report will be submitted on the first day of each month and will be in a format suitable for submittal to other interested agencies.

Consulting Service Agreement – Preparation of Emergency Action Plan for Washoe County's High Hazard Dams

Consultant's failure to submit promptly the monthly progress report may cause delay in payment from the County.

ARTICLE 5 - STANDARD OF CARE

Consultant shall exercise the same degree of care, skill, and diligence in the performance of the Services as is ordinarily provided under similar circumstances and Consultant shall, at no cost to County, re-perform services which fail to satisfy the foregoing standard of care provided that Consultant is notified in writing by County of the deficiency within six (6) months of performance of the deficient Services. Such re-performed Services may include, but not be limited to, correcting errors and omissions, or any other deficiencies in designs, drawings, specifications and reports. County reserves the right to inspect, comment on, and request revision of, all Services performed by Consultant prior to acceptance. Failure to provide Services or re-performed Services in accordance with the foregoing standard of care shall constitute a material breach of this Agreement unless waived by the County. Review and approvals by County do not relieve Consultant of its responsibilities under this Article. Except as is otherwise provided for in this Article, the re-performance of Services is the Consultant's entire responsibility and the County's exclusive remedy for Services rendered or to be rendered hereunder, and no additional warranties, guarantees or obligations are to be implied.

ARTICLE 6 - LIMITATIONS OF RESPONSIBILITY

Consultant shall not be responsible for construction means, methods, techniques, sequences, procedures, or safety precautions and programs in connection with the Project. In addition, Consultant shall not be responsible for the failure of any other consultant, subcontractor, vendor, or other project participant to fulfill contractual or other responsibilities to County or to comply with federal, state, or local laws, ordinances, regulations, rules, codes, orders, criteria, or standards. Consultant shall notify County of any apparent unsafe conditions, methods or procedures that the Consultant may observe at the project site.

ARTICLE 7 - OPINIONS OF COST AND SCHEDULE

Since Consultant has no control over the cost of labor, materials, equipment or services furnished by others, including over any other consultants', subcontractors', or vendors' methods of determining prices, or over competitive bidding or market conditions, Consultant's cost estimates shall be made on the basis of qualification and experience.

Since Consultant has no control over the resources provided by others to meet contract schedules, Consultant's forecast schedules for completion of Services shall be established based on generally acceptable schedules for and performance standards of similarly situated professionals qualified and experienced to perform the Services. Consultant cannot and does not guarantee that proposals, bids or actual project costs will not vary from its cost estimates or that actual schedules will not vary from its forecast schedules.

ARTICLE 8 - INDEPENDENT CONTRACTOR

Consultant undertakes performance of the Services as an independent contractor and shall be wholly responsible for the methods of performance. County shall have no right to supervise the

methods used by Consultant. County shall have the right to observe such performance. Consultant shall work closely with County in performing Services under this Agreement.

ARTICLE 9 - PERMITS AND LICENSES

Consultant shall procure the permits, certificates, and licenses necessary to allow Consultant to perform the Services. Consultant shall not be responsible for procuring permits, certificates, and licenses required for any construction unless such responsibilities are specifically assigned to Consultant in Exhibit A, Scope of Services.

ARTICLE 10 - COUNTY'S RESPONSIBILITY

County shall provide any information authorized by law in its possession that is requested by Consultant and is necessary to complete the Project. County shall assist Consultant in obtaining access to public and private lands so Consultant can perform the Services. County shall examine all studies, reports, sketches, estimates, specifications, drawings, proposals, and other documents presented by Consultant and shall render decisions pertaining thereto within a reasonable time so as not to delay the work of Consultant.

ARTICLE 11 - REUSE OF DOCUMENTS

All documents, including computer files, drawings, specifications, and computer software, prepared by Consultant pursuant to this Agreement are instruments of service in respect to the Project. They are not intended or represented to be suitable for reuse by County or others on extensions of the Project or on any other project. Any reuse without written verification or adaptation by Consultant for the specific purpose intended will be at County's sole risk and without liability or legal exposure to Consultant; and County shall indemnify and hold harmless Consultant against all claims, damages, losses, and expenses including attorneys' fees arising out of or resulting from such reuse. Any such verification or adaptation will entitle Consultant to further compensation at rates to be agreed upon by County and Consultant.

Copies of all documents, including reports, computer files, drawings, specifications, and computer software, prepared by Consultant pursuant to this agreement will be provided to the County in electronic format accompanied by the appropriate documentation necessary to catalog them in the context of this project.

When transferring data in electronic media format, Consultant makes no representation as to long term compatibility, usability, or readability of documents resulting from the use of software application packages, operating systems, or computer hardware differing from those used by Consultant at the beginning of the Project.

Because the data stored in electronic media format can deteriorate or be modified inadvertently or otherwise without authorization of the data's creator, the party receiving electronic files agrees that it will perform acceptance tests or procedures within 60 days, after which the receiving party shall be deemed to have accepted the data thus transferred. Any errors detected within the 60-day acceptance period will be corrected by the party delivering the electronic files. Consultant shall not be responsible to maintain documents stored in electronic media format after acceptance by County.

ARTICLE 12 - TERMINATION OR EXTENSION OF CONTRACT

Either Party may terminate this Agreement by written notice to the other Party if the other Party is in material breach or default of any provision of this Agreement and does not remedy such breach or default, or provide satisfactory evidence that such default will be expeditiously remedied, within thirty (30) days after being given such notice. In the event of such termination, County shall pay Consultant for all Services satisfactorily performed to the date of termination.

County, in its sole discretion, shall have the right to terminate this Agreement or suspend performance thereof for County's convenience upon written notice to Consultant, and Consultant shall terminate or suspend performance of services within thirty (30) days on a schedule acceptable to County. In the event of termination or suspension for County's convenience, County shall pay Consultant for all Services performed in accordance with the terms of this Agreement.

In the event that the County's governing body fails to appropriate or budget funds for the purposes specified in this Agreement, or that the County's governing body has been required, in its sole judgment, to amend previous appropriations or budgeted amounts to eliminate or reduce funding for the purposes of this Agreement, this Agreement shall be terminated without penalty, charge, or sanction.

ARTICLE 13 - NONDISCLOSURE OF PROPRIETARY INFORMATION

Consultant shall consider all information provided by County to be proprietary unless such information is available from public sources, was known to Consultant prior to the execution of this Agreement, was received by Consultant from a third-party source not under any obligation of confidentiality to the County, or is required by law or ordered to be disclosed in a regulatory or judicial proceeding. Consultant shall not publish or disclose proprietary information for any purpose other than the performance of the Services without the prior written authorization of County or in response to legal process or as required by the regulations of public entities.

ARTICLE 14 - NOTICE

Any notice, demand, or request required by or made pursuant to this Agreement shall be deemed properly made if personally delivered in writing or deposited in the United States mail, postage prepaid, to the address specified below:

To County:

David Solaro, Director
Washoe County Community Services
1001 East 9th Street
Reno, NV 89512

To Consultant:

Noel C. Laughlin
HDR Engineering, Inc.
9805 Double R. Boulevard, Suite 101
Reno NV 89521

Nothing contained in this Article shall be construed to restrict the transmission of routine communications between representatives of Consultant and County.

ARTICLE 15 - UNCONTROLLABLE FORCES

Neither County nor Consultant shall be considered to be in default of this Agreement if delays in or failure of performance shall be due to uncontrollable forces the effect of which, by the exercise of reasonable diligence, the non-performing party could not avoid and is not reasonably foreseeable at the time of entering into this Agreement. The term "uncontrollable forces" shall mean any event which results in the prevention or delay of performance by a party of its obligations under this Agreement and which is beyond the control of the non-performing party. It includes, but is not limited to, fire, flood, earthquakes, storms, lightning, epidemic, war, riot, civil disturbance, sabotage, inability to procure permits, licenses, or authorizations from any state, local, or federal agency or person for any of the supplies, materials, accesses, or services required to be provided by either County or Consultant under this Agreement, strikes, work slowdowns or other labor disturbances, and judicial restraint. Consultant shall be paid for services performed prior to the delay plus related costs incurred attributable to the delay.

Neither Party shall, however, be excused from performance if nonperformance is due to uncontrollable forces which are removable or remediable nor which the non-performing Party could have, with reasonable dispatch removed or remedied. The provisions of this Article shall not be interpreted or construed to require Consultant or County to prevent, settle, or otherwise avoid a strike, work slowdown, or other labor action. The non-performing Party shall upon being prevented or delayed from performance by an uncontrollable force, immediately give written notice to the other Party describing the circumstances and uncontrollable forces preventing continued performance of the obligations of this Agreement.

ARTICLE 16 - GOVERNING LAW-VENUE

Nevada law governs this Agreement and all adversarial proceedings arising out of this Agreement or arising out of planning or constructing the Project outlined in Article 2 – Services to be Performed by Consultant. Venue for all adversarial proceedings arising out of this Agreement or arising out of planning or constructing the Project outlined in Article 2 – Services to be Performed by Consultant shall be in state district court in Washoe County, Nevada.

ARTICLE 17 - MISCELLANEOUS

17.1 Nonwaiver

A waiver by either County or Consultant of any breach of this Agreement shall not be binding upon the waiving Party unless such waiver is in writing. In the event of a written waiver, such a waiver shall not affect the waiving party's rights with respect to any other or further breach.

17.2 Severability

If any provision of this Agreement is held to be unenforceable, then that provision is to be construed either by modifying it to the minimum extent necessary to make it enforceable or disregarding it. If an unenforceable provision is modified or disregarded in accordance with this Article 17, the rest of the Agreement is to remain in effect as written, and the unenforceable provision is to remain as written in any circumstances other than those in which the provision is held to be unenforceable.

17.3 Attorney Fees

The prevailing party in any dispute arising out this Agreement or Consultant's work described in Exhibit A – Scope of Work, is entitled to reasonable costs and attorneys' fees.

ARTICLE 18 - INTEGRATION AND MODIFICATION

This Agreement represents the entire and integrated agreement between the Parties and supersedes all prior negotiations, representations, or agreements, either written or oral. This Agreement may be amended only by a written instrument signed by each of the Parties. Unless otherwise specified in writing, if there is any inconsistency between the terms of this Agreement and any other agreement between the Parties, the terms of this Agreement shall control.

ARTICLE 19 - SUCCESSORS AND ASSIGNS

County and Consultant each binds itself and its directors, officers, partners, successors, executors, administrators, assigns and legal representatives to the other party to this Agreement and to the partners, successors, executors, administrators, assigns, and legal representatives of such other party, in respect to all covenants, agreements, and obligations of this Agreement.

ARTICLE 20 - ASSIGNMENT

Neither County nor Consultant shall assign, sublet, or transfer any rights under or interest in (including, but without limitation, monies that may become due or monies that are due) this Agreement without the written consent of the other, except to the extent that the effect of this limitation may be restricted by law. Unless specifically stated to the contrary in any written consent to an assignment, no assignment will release or discharge the assignor from any duty or responsibility under this Agreement. Nothing contained in this paragraph shall prevent Consultant from employing such independent consultants, associates, and subcontractors, as he may deem appropriate to assist him in the performance of the Services hereunder.

ARTICLE 21 - THIRD PARTY RIGHTS

Nothing herein shall be construed to give any rights or benefits to anyone other than County and Consultant.

ARTICLE 22 – INDEMNIFICATION AND INSURANCE

Washoe County has established specific indemnification and insurance requirements for agreements/contracts with consultants, engineers, and architects to help assure that reasonable insurance coverage is maintained. Indemnification and hold harmless clauses are intended to assure that consultants accept and are able to pay for the loss or liability related to their activities. **Exhibit "C" Insurance Specifications** is included by reference. All conditions and requirements identified in this exhibit shall be completed prior to the commencement of any work under this Agreement.

ARTICLE 23 – LIMITED LIABILITY

County will not waive and intends to assert available defenses and limitations contained in Chapter 41 of the Nevada Revised Statutes. Contract liability of both parties shall not be subject to

Consulting Service Agreement – Preparation of Emergency Action Plan for Washoe County's High Hazard Dams

punitive damages. Actual damages for the County's breach of this Agreement shall never exceed the amount of funds that have been appropriated for payment under this Agreement, but not yet paid, for the fiscal year budget in existence at the time of the breach.

Consultant agrees to indemnify, hold harmless and defend County and the employees, officers and agents of County from any liabilities, damages, losses, claims, actions or proceedings, including, without limitation, reasonable attorneys' fees and costs, to the extent that such liabilities, damages, losses, claims, actions or proceedings are caused by the negligence, errors, omissions, recklessness or intentional misconduct of Consultant or the employees or agents of the Consultant (1) in the performance of the contract, or (2) which are, or are not, based upon or arising out of the professional services of Consultant, to the full extent allowed by law.

More specifically and without limitation to the foregoing, in recognition of the limitations provided in NRS 338.155, Consultant is not required to defend County and the employees, officers and agents of the County with respect to the liabilities, damages, losses, claims, actions or proceedings caused by the negligence, errors, omissions, recklessness or intentional misconduct of Consultant or the employees or agents of Consultant which are based upon or arising out of the professional services of Consultant. However, if Consultant is adjudicated to be liable by a trier of fact, the trier of fact shall award reasonable attorney's fees and costs to be paid to the County, as reimbursement for the attorney's fees and costs incurred by County in defending the action, by Consultant in an amount which is proportionate to the liability of Consultant.

ARTICLE 24 - ORGANIZATION'S CERTIFICATION

Consultant, its principals and agents, to the best of its knowledge and belief:

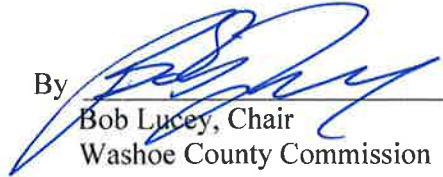
- a) Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal or state department or agency;
- b) Have not within a three year period preceding this Agreement been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State, or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;
- c) Are not presently indicted for or otherwise criminally or civilly charged by a government entity (Federal, State, or local) with commission of any of the offenses enumerated in (ii) above;
- d) Have not within a three-year period preceding this Agreement had one or more public transactions (Federal, State, or local) terminated for cause or default; and
- e) Understand that a false statement on this certification may be grounds for rejection or termination of this Agreement. In addition, under 18 USC Sec. 1001, a false statement may result in a fine of up to \$10,000 or imprisonment for up to 5 years, or both.

IN WITNESS WHEREOF, the parties have executed this Agreement.

WASHOE COUNTY:

Dated this 25th day of July, 2017

By


Bob Lucey, Chair
Washoe County Commission

CONSULTANT:

Dated this 21 day of June, 2017

By

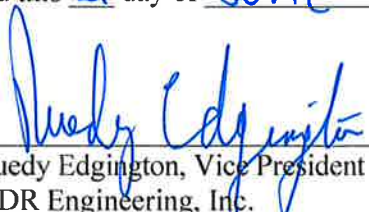

Ruedy Edgington, Vice President
HDR Engineering, Inc.

EXHIBIT A

Scope of Services

This scope of services is intended to provide a description of the tasks anticipated with preparing an Emergency Action Plan (EAP) for the North Spanish Springs Sediment Basin (sediment basin) and updating the EAP for the Spanish Springs Flood Detention Basin (detention basin) based on a cascading type of breach or overtopping failure of both dams. EAPs are needed to provide early warning and notification of a dam breach or overtopping to reduce loss of life and property damage downstream of a dam. Included in an EAP are evacuation and inundation maps, and contact information for local emergency managers.

The North Spanish Springs Sediment Basin is located immediately south of Calle De La Plata and approximately 825 feet east of Pyramid Highway in the Spanish Springs Valley. The sediment basin lies approximately 2,950 feet upstream of the North Spanish Springs Flood Detention Basin. The sediment basin is intended to capture flood borne sediments and reduce the amount of sediment conveyed to the North Spanish Springs Flood Detention Basin.

The sediment basin and the detention basin are both considered to be "high hazard" by the State of Nevada Division of Water Resources (DWR), and therefore EAPs are required. The EAPs will be prepared using guidance from *FEMA Federal Guidelines for Dam Safety, Emergency Action Planning for Dams (FEMA 64)*, dated July 2013, as well as input from the DWR.

The following tasks are anticipated for the preparation of an EAP for the North Spanish Springs Sediment Basin:

1. Project Management, Coordination, Meetings

This task includes administrative and project management tasks, invoicing, monthly coordination meetings. Any proposed changes in or departures from this scope proposed by the County or initiated by HDR will be provided to the County in writing.

2. Data Collection and Field Review

HDR personnel will collect digital and paper data relevant to hydrologic and hydraulic analyses for the dam and surrounding areas, hazard mapping for the project area, inspection reports, design drawings, as-built drawings, available topographic and survey data, and etc. The data collected will be used for the analysis, model construction, and GIS mapping.

Hydrologic Information: The County will provide HDR with pertinent drainage reports, design reports, and etc. for the sediment basin and for the detention basin. HDR staff will review the hydrologic analyses prepared for the sediment basin to ensure that the hydrologic analyses were performed in keeping with proper hydrologic criteria and modeling methods. This scope assumes that no changes will need to be made to the hydrologic analyses. If updates to the hydrologic modeling are required additional fee will be required.

Terrain Data: The County will provide HDR with the most current LiDAR and rectified ortho aerial photo mapping for the project area and water course at no cost to HDR. HDR will provide the County with the

LiDAR tiles needed. The LiDAR data will be used to create a terrain that will be the basis for the hydraulic models.

Supplemental survey data may be required to ensure that key features of the dam are coded into the hydraulic model correctly (i.e. top of embankment elevations, spillway elevations, low level outlet configuration, down stream bridges/culverts, etc.). Any supplemental survey requirements identified by HDR will be provided by HDR by a subconsultant surveyor.

Soil Data: HDR will collect soils data from the Natural Resource Conservation Service's Soil Survey Geographic Database. This data will be used to verify the inputs to the hydrologic model.

Land Use: The County will provide HDR with the most current land use planning data for the project watershed in GIS format.

As-Built Information: HDR will collect as-built/design information for the sediment basin and downstream roadway, culvert, and residential developments from the County and the Nevada Department of Transportation (NDOT) as necessary.

3. Identify Trigger Events

HDR will review reservoir as-builts if available, geotechnical reports, hydrological and hydraulic/drainage reports, permits, dam inspection reports and other pertinent material available to be provided by Washoe County. HDR will visit each site to observe the potential for a failure mechanism. HDR will determine the most likely failure mechanism that would result in the most critical breach for any given area downstream of each referenced facility.

4. Identification of Jurisdictions, Agencies and Individuals Requiring Notification

HDR will work with staff from Washoe County to identify all jurisdictions, agencies and individuals requiring notification in the event of occurrence of a rupture of the dam referenced in this Scope of Work. This task will be incomplete with respect to individuals or residents of properties downstream of and in the pathway of a potential flood resulting from the rupture of the referenced dam. These properties will be identified upon completion of the inundation mapping.

5. Determine the Appropriate Procedures to be Used Prior to an Emergency

HDR will work with Washoe County personnel to document appropriate inspection and surveillance procedures to be followed prior to an emergency. HDR will work with and recommend any alterations to current schedule for site inspections to the reservoir. HDR will document existing operation and maintenance procedures and recommend any necessary alterations.

6. Determine the Appropriate Procedures to be Used During an Emergency

HDR will work with Washoe County personnel to document appropriate communications and procedures to be followed during an emergency with respect to rupture of the referenced dam structure. This includes evacuation and recovery procedures.

7. Terrain Development

It is anticipated that the US Army Corps of Engineers' HEC-RAS V5.0.3 hydraulic model will be used to develop breach hydrographs and for hydraulic routing of those flows. It will therefore be necessary to develop a digital terrain model as the geometric foundation for the hydraulic model.

Digital Terrain development will be conducted using ESRI's ArcMap capabilities using the latest Washoe County LiDAR data. It is assumed that Washoe County will provide the 2013 1-meter resolution "ground" data for the study area which is the Central Truckee Meadows LiDAR tile. These data are assumed to be in NAD83 State Plane Feet projection with a vertical datum of NAVD88. HDR staff will use the ground classified LiDAR points to create a Triangular Irregular Network (TIN) which will then be converted to a raster dataset at a 1-2 ft. resolution for ingestion to HEC-RAS. It is assumed that channel bathymetry and any supplemental topographic data is not required for the level of detail required by the EAP. The terrain dataset will represent the existing conditions in 2013 as captured by the processed Ground Points. Minimal terrain corrections or processing will be conducted. The terrain will be an "as is" condition.

If data is readily available, building footprints will be added to the terrain as elevated features to simulate the behavior of the blocked obstructions in the model.

8. Hydraulic Model Development

Given the urban nature of the consequence area for the North Spanish Springs Sediment Basin Dam area, an unsteady-state two dimensional (2D) model has been chosen for analysis. The US Army Corps of Engineers' HEC-RAS V5.0.3 hydraulic model has the capability to model 2D flow in a structured/unstructured mesh and provide detailed mapping and hydraulic output information. This version of HEC-RAS also has the capability to simulate dam breach progressions and route the resulting breach hydrograph through the model domain, allowing better characterization of unpredictable divided flow.

a. Model development

The modeling domain for the North Spanish Springs Sediment Basin Dam and consequence area will begin at the upstream extent of the respective reservoirs and terminate at the Truckee River. The reservoir volume will be captured by the 2D modeling domain.

It is anticipated that the Breach Models will be full 2D models for ease of run, stability, connectivity and consistency of approach for all 3 areas. The model domain will be developed in GIS as a polygon layer capturing the largest potential consequence area. The model domain will incorporate breakline data as appropriate to capture hydraulically relevant high points in the terrain such as roadway crowns or structure overtopping sections.

After the model domain geometry has been completed, inflow locations will be determined from previous hydrologic modeling efforts and added to the domain. An appropriate downstream boundary condition will be added at the Truckee River.

Currently, HEC-RAS does not have the capability to model bridges in the 2D domain. Major structures that impact hydraulic behavior will be added to the model as culverts. HDR staff will inspect all 3 previous models to determine which structures should be added to the model and incorporate those as culverts. The model will be run to determine hydraulic performance of the structures so that they can be compared to the performance of their counterparts in the 1D models. "Bridge" culverts will then be modified to approximate the hydraulic behavior of the bridges.

Manning's n values will be developed for the modeling area using aerial photos, field photos and GIS capabilities. Areas of homogeneous land use will be digitized as a land use layer for inclusion into the 2D modeling area. Once land use zones have been digitized, the methods described in USGS Water-Supply Paper 2933, HDR developed Manning's roughness (" n ") values for the channel and overbank regions (Arcement & Schneider, 1989) will be used to estimate roughness values.

It is anticipated that the model will be run in Full Momentum computation mode with default options and tolerances. The model will be run for both the "Sunny Day" and "PMF" events. It is anticipated that the Sunny Day event will be run with a piping breach scenario only and the PMF event will be run with both overtopping and piping scenarios to determine worse case impacts.

b. Dam Breach Parameterization

One of the most crucial elements of Dam Breach modeling and hazard identification is the selection of dam breach parameters. There are several different failure models and many different methodologies for estimating physical breach characteristics and breach progression timing. The embankment material, failure location and failure mode all play crucial roles in determining the ultimate breach and resulting hydrograph impacting the consequence area.

The two main failure modes for breach analyses are overtopping and piping failure. Both of these modes will be investigated for this study. Empirical relationships have been developed for a variety of dam types relating dam breach parameters, including timing, with physical characteristics of the embankment and relative water levels. These methods are all described in the US Army Corps of Engineers' guidance document *Using HEC-RAS for Dam Break Studies* (2014). This document will be used for general guidance along with other appropriate dam breach publications from sources like the US Bureau of Reclamation (US BoR), USDA Natural Resource Conservation Service (NRCS), and the Federal Emergency Management Agency (FEMA). HDR will analyze a maximum of 3 breach locations on the dam embankment. The breach analyses will also include a cascading failure with the North Spanish Springs Detention Basin.

It is anticipated that the primary regulatory guidance will be FEMA 64 (July 2013) Federal guidelines for Dam Safety. Breach modeling will also be subject to State of Nevada Divisions of Water Resources guidelines and dam safety regulations outlined in Nevada Revised Statute (NRS) 535.

9. Inundation Mapping

Following breach hydrograph development and associated flood routing, the results of the hydraulic modeling will be processed in HEC-RAS Mapper for incorporation into hazard maps. Inundation mapping shall include the following elements:

- North arrow and bar scale
- Clearly labeled inundation areas
- Qualification stating that the hazard areas may differ during an actual dam failure event
- Roads drainages and other landmarks are clearly displayed
- Critical faculties identified
- Logical downstream limits
- "Cross sections" taken at critical locations (for 2D modeling the use of a flux line will replace traditional cross sections).
- Flood inundation information includes; peak flood stage, flood wave arrival time, maximum water surface elevation, peak discharge, and depth times velocity.

10. EAP Preparation

FEMA 64 has guidelines and suggestions for the development of EAPs. The suggested outline for an EAP includes two parts, Part I "EAP Information and Appendices. Within Part I there are eight subsections recommendations. The EAP will follow this format as summarized below:

Part I: EAP Information

I. Summary of EAP Responsibilities

II. Notification Flowcharts

III. Statement of Purpose

IV. Project Description

V. EAP Response Process

Step 1: Incident Detection, Evaluation, and Emergency Level Determination

Step 2: Notification and Communication

Step 3: Emergency Actions

Step 4: Termination and Follow-up

VI. General Responsibilities

Dam Owner Responsibilities

Notification and Communication Responsibilities

Evacuation Responsibilities

Monitoring, Security, Termination, and Follow-up Responsibilities

EAP Coordinator Responsibilities

VII. Preparedness

Surveillance and Monitoring

Evaluation of Detection and Response Timing

Access to the Site

Response during Periods of Darkness

Response during Weekends and Holidays

Response during Adverse Weather

Alternative Sources of Power

Emergency Supplies and Information

Stockpiling Materials and Equipment
Coordination of Information
Training and Exercise
Alternative Systems of Communication
Public Awareness and Communication

VIII. Inundation Maps

Part II: Appendices

Contents within each of these Sections will follow guidance provided in chapter II of the FEMA 64 guidelines.

Washoe County
North Spanish Springs Sediment Basin Emergency Action Plan

Task No.	Task Description	R. Edgington Project Principal Engineer	L. Kubiak Accountant Sr	N. Laughlin Project Manager General	M. Forest Quality Control Reviewer	K. Weaver Engineer Water Resources	M. Blum Engineer Water Resources Sr	G. Bursl Engineer Water Resources Sr	S. Lewis EIT Water Resources	Total HDR Labor Hours	Total HDR Labor (\$)	Total HDR Expenses (\$)	Subs (\$)	Total Cost (\$)
	Rates	\$ 323.24	\$ 155.90	\$ 265.76	\$ 324.59	\$ 140.05	\$ 182.43	\$ 160.02	\$ 76.12					
Task 3 - Project Management														
1.1	Project Initiation	2	4	2						8	\$1,802	\$0		\$1,802
1.2	Invoicing and Progress Tracking		4	4						8	\$1,687			\$1,687
1.3	Client Coordination			4						4	\$1,063			\$1,063
	Subtotal Task 1	2	8	10	0	0	0	0	0	20	\$4,551	\$0	\$0	\$4,551
Task 2 - Data Collection														
2.1	Data Collection			1		4			8	13	\$1,454	\$0	\$4,200	\$5,654
	Subtotal Task 2	0	0	1	0	4	0	0	8	13	\$1,454	\$0		\$5,654
Task 3 - Identify Triggering Events														
3.1	Identify Triggering Events			2		2	4			8	\$1,543	\$0	\$0	\$1,543
	Subtotal Task 3	0	0	2	0	2	4	0	0	8	\$1,543	\$0	\$0	\$1,543
Task 4 - ID Notification														
4.1	Identify Jurisdictions, Agencies, and Individuals			1		1				2	\$407	\$0		\$407
	Subtotal Task 4	0	0	1	0	1	0	0	0	2	\$407	\$0	\$0	\$407
Task 5 - Determine the Appropriate Procedures to be Used Prior to an Emergency														
5.1	Determine Procedures			2				2	4	6	\$1,164	\$0		\$1,164
	Subtotal Task 5	0	0	2	0	0	0	2	4	8	\$1,164	\$0	\$0	\$1,164
Task 6 - Determine the Appropriate Procedures to be Used During an Emergency														
6.1	Determine Procedures			2				2	4	8	\$1,164	\$0		\$1,164
	Subtotal Task 6	0	0	2	0	0	0	2	4	8	\$1,164	\$0	\$0	\$1,164
Task 7 - Terrain Development														
7.1	Terrain Development				4	24	4			32	\$5,409	\$0		\$5,409
	Subtotal Task 7	0	0	0	4	24	4	0	0	32	\$5,409	\$0	\$0	\$5,409
Task 8 - Hydraulic Model Development														
8.1	Model Development			4	4	48	4		8	68	\$10,477	\$0	\$0	\$10,477
8.2	Dam Breach Parameterization			1	1	4	4			10	\$1,863	\$0		\$1,863
	Subtotal Task 8	0	0	5	5	52	8	0	8	78	\$12,361	\$0	\$0	\$12,361
Task 9 - Inundation Mapping														
9.1	Inundation Mapping				2	16	4			22	\$3,633	\$0		\$3,633
	Subtotal Task 9	0	0	0	2	16	4	0	0	22	\$3,633	\$0	\$0	\$3,633
Task 10 - EAP Preparation														
10.1	EAP Preparation			4				24	40	68	\$8,028	\$30		\$8,058
	Subtotal Task 10	0	0	4	0	0	0	24	40	68	\$8,028	\$30	\$0	\$8,058
COLUMN TOTALS											98,713	\$30.00	\$4,200	\$43,943

6/2/2017

HDR Engineering, Inc.

EXHIBIT A

Scope of Services

This scope of services is intended to provide a description of the tasks anticipated with preparing an Emergency Action Plan (EAP) for the Herman Dam. EAPs are needed to provide early warning and notification of a dam breach or overtopping to reduce loss of life and property damage downstream of a dam. Included in an EAP are evacuation and inundation maps, and contact information for local emergency managers.

The Herman Dam is located in the southwest quadrant of north McCarran Boulevard and North Virginia Street in the Rancho San Rafael Park. The Herman Dam is located in Section 3, Township 19, Range 19.

The Herman Dam is considered to be "high hazard" by the State of Nevada Division of Water Resources (DWR), and therefore EAPs are required. The EAPs will be prepared using guidance from *FEMA Federal Guidelines for Dam Safety, Emergency Action Planning for Dams (FEMA 64)*, dated July 2013, as well as input from the DWR.

The following tasks are anticipated for the preparation of an EAP for the Herman Dam:

1. Project Management, Coordination, Meetings

This task includes administrative and project management tasks, invoicing, monthly coordination meetings. Any proposed changes in or departures from this scope proposed by the County or initiated by HDR will be provided to the County in writing.

2. Data Collection and Field Review

HDR personnel will collect digital and paper data relevant to hydrologic and hydraulic analyses for the dam and surrounding areas, hazard mapping for the project area, inspection reports, design drawings, as-built drawings, available topographic and survey data, and etc. The data collected will be used for the analysis, model construction, and GIS mapping.

Hydrologic Information: The County will provide HDR with pertinent drainage reports, design reports, and etc. for the sediment basin and for the detention basin. HDR staff will review the hydrologic analyses prepared for the sediment basin to ensure that the hydrologic analyses were performed in keeping with proper hydrologic criteria and modeling methods. This scope assumes that no changes will need to be made to the hydrologic analyses. If updates to the hydrologic modeling are required additional fee will be required.

Terrain Data: The County will provide HDR with the most current LiDAR and rectified ortho aerial photo mapping for the project area and water course at no cost to HDR. HDR will provide the County with the LiDAR tiles needed. The LiDAR data will be used to create a terrain that will be the basis for the hydraulic models.

Supplemental survey data may be required to ensure that key features of the dam are coded into the hydraulic model correctly (i.e. top of embankment elevations, spillway elevations, low level outlet

configuration, down stream bridges/culverts, etc.). Any supplemental survey requirements identified by HDR will be provided by HDR by a subconsultant surveyor.

Soil Data: HDR will collect soils data from the Natural Resource Conservation Service's Soil Survey Geographic Database. This data will be used to verify the inputs to the hydrologic model.

Land Use: The County will provide HDR with the most current land use planning data for the project watershed in GIS format.

As-Built Information: HDR will collect as-built/design information for the dam and downstream roadway, culvert, UNR, and residential developments from the County, the City of Reno and the Nevada Department of Transportation (NDOT) as necessary.

3. Identify Trigger Events

HDR will review dam as-builts if available, geotechnical reports, hydrological and hydraulic/drainage reports, permits, dam inspection reports and other pertinent material available to be provided by Washoe County. HDR will visit each site to observe the potential for a failure mechanism. HDR will determine the most likely failure mechanism that would result in the most critical breach for any given area downstream of each referenced facility.

4. Identification of Jurisdictions, Agencies and Individuals Requiring Notification

HDR will work with staff from Washoe County to identify all jurisdictions, agencies and individuals requiring notification in the event of occurrence of a rupture of the dam referenced in this Scope of Work. This task will be incomplete with respect to individuals or residents of properties downstream of and in the pathway of a potential flood resulting from the rupture of the referenced dam. These properties will be identified upon completion of the inundation mapping.

5. Determine the Appropriate Procedures to be Used Prior to an Emergency

HDR will work with Washoe County personnel to document appropriate inspection and surveillance procedures to be followed prior to an emergency. HDR will work with and recommend any alterations to current schedule for site inspections to the reservoir. HDR will document existing operation and maintenance procedures and recommend any necessary alterations.

6. Determine the Appropriate Procedures to be Used During an Emergency

HDR will work with Washoe County personnel to document appropriate communications and procedures to be followed during an emergency with respect to rupture of the referenced dam structure. This includes evacuation and recovery procedures.

7. Terrain Development

It is anticipated that the US Army Corps of Engineers' HEC-RAS V5.0.3 hydraulic model will be used to develop breach hydrographs and for hydraulic routing of those flows. It will therefore be necessary to develop a digital terrain model as the geometric foundation for the hydraulic model.

Digital Terrain development will be conducted using ESRI's ArcMap capabilities using the latest Washoe County LiDAR data. It is assumed that Washoe County will provide the 2013 1 meter resolution "ground" data for the study area which is the Central Truckee Meadows LiDAR tile. These data are assumed to be in NAD83 State Plane Feet projection with a vertical datum of NAVD88. HDR staff will use the ground classified LiDAR points to create a Triangular Irregular Network (TIN) which will then be converted to a raster dataset at a 1-2 ft. resolution for ingestion to HEC-RAS. It is assumed that channel bathymetry and any supplemental topographic data is not required for the level of detail required by the EAP. The terrain dataset will represent the existing conditions in 2013 as captured by the processed Ground Points. Minimal terrain corrections or processing will be conducted. The terrain will be an "as is" condition.

If data is readily available, building footprints will be added to the terrain as elevated features to simulate the behavior of the blocked obstructions in the model.

8. Hydraulic Model Development

Given the urban nature of the consequence area for the Herman Dam area, an unsteady-state two dimensional (2D) model has been chosen for analysis. The US Army Corps of Engineers' HEC-RAS V5.0.3 hydraulic model has the capability to model 2D flow in a structured/unstructured mesh and provide detailed mapping and hydraulic output information. This version of HEC-RAS also has the capability to simulate dam breach progressions and route the resulting breach hydrograph through the model domain, allowing better characterization of unpredictable divided flow.

a. Model development

The modeling domain for both the Herman Dam and consequence area will begin at the upstream extent of the respective reservoirs and terminate at the Truckee River or at a logical downstream limit agreed upon with the County. The reservoir volume will be captured by the 2D modeling domain.

It is anticipated that the Breach Models will be full 2D models for ease of run, stability, connectivity and consistency of approach for all 3 areas. The model domain will be developed in GIS as a polygon layer capturing the largest potential consequence area. The model domain will incorporate breakline data as appropriate to capture hydraulically relevant high points in the terrain such as roadway crowns or structure overtopping sections.

After the model domain geometry has been completed, inflow locations will be determined from previous hydrologic modeling efforts and added to the domain. An appropriate downstream boundary condition will be added at the Truckee River.

Currently, HEC-RAS does not have the capability to model bridges in the 2D domain. Major structures that impact hydraulic behavior will be added to the model as culverts. HDR staff will inspect all 3 previous models to determine which structures should be added to the model and incorporate those as culverts. The model will be run to determine hydraulic performance of the structures so that they can be compared to the performance of their counterparts in the 1D models. "Bridge" culverts will then be modified to approximate the hydraulic behavior of the bridges.

Manning's n values will be developed for the modeling area using aerial photos, field photos and GIS capabilities. Areas of homogeneous land use will be digitized as a land use layer for inclusion into the 2D modeling area. Once land use zones have been digitized, the methods described in USGS Water-Supply Paper 2933, HDR developed Manning's roughness ("n") values for the channel and overbank regions (Arcement & Schneider, 1989) will be used to estimate roughness values.

It is anticipated that the model will be run in Full Momentum computation mode with default options and tolerances. The model will be run for both the "Sunny Day", "1/2 PMF", and "PMF" events. It is anticipated that the Sunny Day event will be run with a piping breach scenario only and the 1/2 PMF and PMF event will be run with both overtopping and piping scenarios to determine worse case impacts. HDR will perform an incremental damage assessment as outlined in NAC 535.

b. Dam Breach Parameterization

One of the most crucial elements of Dam Breach modeling and hazard identification is the selection of dam breach parameters. There are several different failure models and many different methodologies for estimating physical breach characteristics and breach progression timing. The embankment material, failure location and failure mode all play crucial roles in determining the ultimate breach and resulting hydrograph impacting the consequence area.

The two main failure modes for breach analyses are overtopping and piping failure. Both of these modes will be investigated for this study. Empirical relationships have been developed for a variety of dam types relating dam breach parameters, including timing, with physical characteristics of the embankment and relative water levels. These methods are all described in the US Army Corps of Engineers' guidance document *Using HEC-RAS for Dam Break Studies* (2014). This document will be used for general guidance along with other appropriate dam breach publications from sources like the US Bureau of Reclamation (US BoR), USDA Natural Resource Conservation Service (NRCS), and the Federal Emergency Management Agency (FEMA).

It is anticipated that the primary regulatory guidance will be FEMA 64 (July 2013) Federal guidelines for Dam Safety. Breach modeling will also be subject to State of Nevada Divisions of Water Resources guidelines and dam safety regulations outlined in Nevada Revised Statute (NRS) 535.

9. Inundation Mapping

Following breach hydrograph development and associated flood routing, the results of the hydraulic modeling will be processed in HEC-RAS Mapper for incorporation into hazard maps. Inundation mapping shall include the following elements:

- North arrow and bar scale
- Clearly labeled inundation areas
- Qualification stating that the hazard areas may differ during an actual dam failure event
- Roads drainages and other landmarks are clearly displayed
- Critical facilities identified

- Logical downstream limits
- “Cross sections” taken at critical locations (for 2D modeling the use of a flux line will replace traditional cross sections).
- Flood inundation information includes; peak flood stage, flood wave arrival time, maximum water surface elevation, peak discharge, and depth times velocity.

10. EAP Preparation

FEMA 64 has guidelines and suggestions for the development of EAPs. The suggested outline for an EAP includes two parts, Part I “EAP Information and Appendices. Within Part I there are eight subsections recommendations. The EAP will follow this format as summarized below:

Part I: EAP Information

I. Summary of EAP Responsibilities

II. Notification Flowcharts

III. Statement of Purpose

IV. Project Description

V. EAP Response Process

Step 1: Incident Detection, Evaluation, and Emergency Level Determination

Step 2: Notification and Communication

Step 3: Emergency Actions

Step 4: Termination and Follow-up

VI. General Responsibilities

Dam Owner Responsibilities

Notification and Communication Responsibilities

Evacuation Responsibilities

Monitoring, Security, Termination, and Follow-up Responsibilities

EAP Coordinator Responsibilities

VII. Preparedness

Surveillance and Monitoring

Evaluation of Detection and Response Timing

Access to the Site

Response during Periods of Darkness

Response during Weekends and Holidays

Response during Adverse Weather

Alternative Sources of Power

Emergency Supplies and Information

Stockpiling Materials and Equipment

Coordination of Information

Training and Exercise

Alternative Systems of Communication

Public Awareness and Communication

VIII. Inundation Maps

Part II: Appendices

Contents within each of these Sections will follow guidance provided in chapter II of the FEMA 64 guidelines.

Washoe County
Herman Dam Emergency Action Plan

Task No.	Task Description	R. Edgington Project Principal Engineer	L. Kubiak Accountant Sr	N. Laughlin Project Manager General	M. Forest Quality Control Reviewer	K. Weaver Engineer Water Resources	M. Blum Engineer Water Resources Sr	G. Burt Engineer Water Resources Sr	S. Lewis EIT Water Resources	Total HDR Labor Hours	Total HDR Labor (\$)	Total HDR Expenses (\$)	Subs (\$)	Total Cost (\$)
	Rates	\$ 323.24	\$ 155.90	\$ 265.76	\$ 324.59	\$ 140.85	\$ 182.43	\$ 180.02	\$ 78.12					
Task 3 - Project Management														
1.1	Project Initiation	2	4	2						8	\$1,802	\$0		\$1,802
1.2	Invoicing and Progress Tracking		4	4						8	\$1,687			\$1,687
1.3	Client Coordination			4						4	\$1,063			\$1,063
	Subtotal Task 1	2	8	10	0	0	0	0	0	20	\$4,551	\$0	\$0	\$4,551
Task 2 - Data Collection														
2.1	Data Collection					4	4	0	8	12	\$1,188	\$0	\$4,200	\$5,388
	Subtotal Task 2	0	0	0	0	4	4	0	8	12	\$1,188	\$0		\$5,388
Task 3 - Identify Triggering Events														
3.1	Identify Triggering Events			2		2	4			8	\$1,549	\$0	\$0	\$1,549
	Subtotal Task 3	0	0	2	0	2	4	0	0	8	\$1,543	\$0	\$0	\$1,543
Task 4 - ID Notification														
4.1	Identify Jurisdictions, Agencies, and Individuals			1		1				2	\$407	\$0		\$407
	Subtotal Task 4	0	0	1	0	1	0	0	0	2	\$407	\$0	\$0	\$407
Task 5 - Determine the Appropriate Procedures to be Used Prior to an Emergency														
5.1	Determine Procedures			2				8	12	22	\$2,749	\$0		\$2,749
	Subtotal Task 5	0	0	2	0	0	0	8	12	22	\$2,749	\$0	\$0	\$2,749
Task 6 - Determine the Appropriate Procedures to be Used During an Emergency														
6.1	Determine Procedures			2				4	4	10	\$1,484	\$0		\$1,484
	Subtotal Task 6	0	0	2	0	0	0	4	4	10	\$1,484	\$0	\$0	\$1,484
Task 7 - Terrain Development														
7.1	Terrain Development				4	16	4			24	\$4,282	\$0		\$4,282
	Subtotal Task 7	0	0	0	4	16	4	0	0	24	\$4,282	\$0	\$0	\$4,282
Task 8 - Hydraulic Model Development														
8.1	Model Development			2	4	40	12		8	66	\$10,278	\$0	\$0	\$10,278
8.2	Dam Breach Parameterization			1	1	4	4			10	\$1,883	\$0		\$1,883
	Subtotal Task 8	0	0	3	5	44	16	0	8	76	\$12,162	\$0	\$0	\$12,162
Task 9 - Foundation Mapping														
9.1	Foundation Mapping				2	16	4			22	\$3,633	\$0		\$3,633
	Subtotal Task 9	0	0	0	2	16	4	0	0	22	\$3,633	\$0	\$0	\$3,633
Task 10 - EAP Preparation														
10.1	EAP Preparation			4				15	32	52	\$6,123	\$30		\$6,153
	Subtotal Task 10	0	0	4	0	0	0	15	32	52	\$6,123	\$30	\$0	\$6,153
COLUMN TOTALS											38,121	\$50.00	\$4,200	\$42,351

6/2/2017

EXHIBIT A

Scope of Services

This scope of services is intended to provide a description of the tasks anticipated with preparing an Emergency Action Plan (EAP) for the Sierra Sage Pond in the Sierra Sage Golf Course. EAPs are needed to provide early warning and notification of a dam breach or overtopping to reduce loss of life and property damage downstream of a dam. Included in an EAP are evacuation and inundation maps, and contact information for local emergency managers.

The Sierra Sage Pond is located in the northwest quadrant of highway US 395 and Stead Boulevard in the Sierra Sage Golf Course. The pond is located in the northwest quarter of Section 6, Township 20, Range 19.

The Sierra Sage Pond is considered to be "significant hazard" by the State of Nevada Division of Water Resources (DWR), and therefore EAPs are required. The EAPs will be prepared using guidance from *FEMA Federal Guidelines for Dam Safety, Emergency Action Planning for Dams (FEMA 64)*, dated July 2013, as well as input from the DWR.

The following tasks are anticipated for the preparation of an EAP for the Sierra Sage Pond:

1. Project Management, Coordination, Meetings

This task includes administrative and project management tasks, invoicing, monthly coordination meetings. Any proposed changes in or departures from this scope proposed by the County or initiated by HDR will be provided to the County in writing.

2. Data Collection and Field Review

HDR personnel will collect digital and paper data relevant to hydrologic and hydraulic analyses for the dam and surrounding areas, hazard mapping for the project area, inspection reports, design drawings, as-built drawings, available topographic and survey data, and etc. The data collected will be used for the analysis, model construction, and GIS mapping.

Hydrologic Information: The County will provide HDR with pertinent drainage reports, design reports, and etc. for the sediment basin and for the detention basin. HDR staff will review the hydrologic analyses prepared for the sediment basin to ensure that the hydrologic analyses were performed in keeping with proper hydrologic criteria and modeling methods. This scope assumes that no changes will need to be made to the hydrologic analyses. If updates to the hydrologic modeling are required additional fee will be required.

Terrain Data: The County will provide HDR with the most current LiDAR and rectified ortho aerial photo mapping for the project area and water course at no cost to HDR. HDR will provide the County with the LiDAR tiles needed. The LiDAR data will be used to create a terrain that will be the basis for the hydraulic models.

Supplemental survey data may be required to ensure that key features of the dam are coded into the hydraulic model correctly (i.e. top of embankment elevations, spillway elevations, low level outlet

configuration, down stream bridges/culverts, etc.). Any supplemental survey requirements identified by HDR will be provided by HDR by a subconsultant surveyor.

Soil Data: HDR will collect soils data from the Natural Resource Conservation Service's Soil Survey Geographic Database. This data will be used to verify the inputs to the hydrologic model.

Land Use: The County will provide HDR with the most current land use planning data for the project watershed in GIS format.

As-Built Information: HDR will collect as-built/design information for the sediment basin and downstream roadway, culvert, and residential developments from the County as necessary.

3. Identify Trigger Events

HDR will review reservoir as-builts if available, geotechnical reports, hydrological and hydraulic/drainage reports, permits, dam inspection reports and other pertinent material available to be provided by Washoe County. HDR will visit each site to observe the potential for a failure mechanism. HDR will determine the most likely failure mechanism that would result in the most critical breach for any given area downstream of each referenced facility.

4. Identification of Jurisdictions, Agencies and Individuals Requiring Notification

HDR will work with staff from Washoe County to identify all jurisdictions, agencies and individuals requiring notification in the event of occurrence of a rupture of the dam referenced in this Scope of Work. This task will be incomplete with respect to individuals or residents of properties downstream of and in the pathway of a potential flood resulting from the rupture of the referenced dam. These properties will be identified upon completion of the inundation mapping.

5. Determine the Appropriate Procedures to be Used Prior to an Emergency

HDR will work with Washoe County personnel to document appropriate inspection and surveillance procedures to be followed prior to an emergency. HDR will work with and recommend any alterations to current schedule for site inspections to the reservoir. HDR will document existing operation and maintenance procedures and recommend any necessary alterations.

6. Determine the Appropriate Procedures to be Used During an Emergency

HDR will work with Washoe County personnel to document appropriate communications and procedures to be followed during an emergency with respect to rupture of the referenced dam structure. This includes evacuation and recovery procedures.

7. Terrain Development

It is anticipated that the US Army Corps of Engineers' HEC-RAS V5.0.3 hydraulic model will be used to develop breach hydrographs and for hydraulic routing of those flows. It will therefore be necessary to develop a digital terrain model as the geometric foundation for the hydraulic model.

Digital Terrain development will be conducted using ESRI's ArcMap capabilities using the latest Washoe County LiDAR data. It is assumed that Washoe County will provide the 2013 1 meter resolution "ground" data for the study area which is the Central Truckee Meadows LiDAR tile. These data are assumed to be in NAD83 State Plane Feet projection with a vertical datum of NAVD88. HDR staff will use the ground classified LiDAR points to create a Triangular Irregular Network (TIN) which will then be converted to a raster dataset at a 1-2 ft. resolution for ingestion to HEC-RAS. It is assumed that channel bathymetry and any supplemental topographic data is not required for the level of detail required by the EAP. The terrain dataset will represent the existing conditions in 2013 as captured by the processed Ground Points. Minimal terrain corrections or processing will be conducted. The terrain will be an "as is" condition.

If data is readily available, building footprints will be added to the terrain as elevated features to simulate the behavior of the blocked obstructions in the model.

8. Hydraulic Model Development

Given the urban nature of the consequence area for the Sierra Sage Pond, an unsteady-state two dimensional (2D) model has been chosen for analysis. The US Army Corps of Engineers' HEC-RAS V5.0.3 hydraulic model has the capability to model 2D flow in a structured/unstructured mesh and provide detailed mapping and hydraulic output information. This version of HEC-RAS also has the capability to simulate dam breach progressions and route the resulting breach hydrograph through the model domain, allowing better characterization of unpredictable divided flow.

a. Model development

The modeling domain for both the Sierra Sage Pond and consequence area will begin at the upstream extent of the respective pond and terminate at Silver Lake. The reservoir volume will be captured by the 2D modeling domain.

It is anticipated that the Breach Models will be full 2D models for ease of run, stability, connectivity and consistency of approach for all 3 areas. The model domain will be developed in GIS as a polygon layer capturing the largest potential consequence area. The model domain will incorporate breakline data as appropriate to capture hydraulically relevant high points in the terrain such as roadway crowns or structure overtopping sections.

After the model domain geometry has been completed, inflow locations will be determined from previous hydrologic modeling efforts and added to the domain. An appropriate downstream boundary condition will be added at Silver Lake.

Currently, HEC-RAS does not have the capability to model bridges in the 2D domain. Major structures that impact hydraulic behavior will be added to the model as culverts. HDR staff will inspect all 3 previous models to determine which structures should be added to the model and incorporate those as culverts. The model will be run to determine hydraulic performance of the structures so that they can be compared to the performance of their counterparts in the 1D models. "Bridge" culverts will then be modified to approximate the hydraulic behavior of the bridges.

Manning's n values will be developed for the modeling area using aerial photos, field photos and GIS capabilities. Areas of homogeneous land use will be digitized as a land use layer for inclusion into the 2D modeling area. Once land use zones have been digitized, the methods described in USGS Water-Supply Paper 2933, HDR developed Manning's roughness ("n") values for the channel and overbank regions (Arcement & Schneider, 1989) will be used to estimate roughness values.

It is anticipated that the model will be run in Full Momentum computation mode with default options and tolerances. The model will be run for both the "Sunny Day" and "PMF" events. It is anticipated that the Sunny Day event will be run with a piping breach scenario only and the PMF event will be run with both overtopping and piping scenarios to determine worse case impacts.

b. Dam Breach Parameterization

One of the most crucial elements of Dam Breach modeling and hazard identification is the selection of dam breach parameters. There are several different failure models and many different methodologies for estimating physical breach characteristics and breach progression timing. The embankment material, failure location and failure mode all play crucial roles in determining the ultimate breach and resulting hydrograph impacting the consequence area.

The two main failure modes for breach analyses are overtopping and piping failure. Both of these modes will be investigated for this study. Empirical relationships have been developed for a variety of dam types relating dam breach parameters, including timing, with physical characteristics of the embankment and relative water levels. These methods are all described in the US Army Corps of Engineers' guidance document *Using HEC-RAS for Dam Break Studies* (2014). This document will be used for general guidance along with other appropriate dam breach publications from sources like the US Bureau of Reclamation (US BoR), USDA Natural Resource Conservation Service (NRCS), and the Federal Emergency Management Agency (FEMA).

It is anticipated that the primary regulatory guidance will be FEMA 64 (July 2013) Federal guidelines for Dam Safety. Breach modeling will also be subject to State of Nevada Divisions of Water Resources guidelines and dam safety regulations outlined in Nevada Revised Statute (NRS) 535.

9. Inundation Mapping

Following breach hydrograph development and associated flood routing, the results of the hydraulic modeling will be processed in HEC-RAS Mapper for incorporation into hazard maps. Inundation mapping shall include the following elements:

- North arrow and bar scale
- Clearly labeled inundation areas
- Qualification stating that the hazard areas may differ during an actual dam failure event
- Roads drainages and other landmarks are clearly displayed
- Critical facilities identified
- Logical downstream limits

- “Cross sections” taken at critical locations (for 2D modeling the use of a flux line will replace traditional cross sections).
- Flood inundation information includes; peak flood stage, flood wave arrival time, maximum water surface elevation, peak discharge, and depth times velocity.

10. EAP Preparation

FEMA 64 has guidelines and suggestions for the development of EAPs. The suggested outline for an EAP includes two parts, Part I “EAP Information and Appendices. Within Part I there are eight subsections recommendations. The EAP will follow this format as summarized below:

Part I: EAP Information

I. Summary of EAP Responsibilities

II. Notification Flowcharts

III. Statement of Purpose

IV. Project Description

V. EAP Response Process

Step 1: Incident Detection, Evaluation, and Emergency Level Determination

Step 2: Notification and Communication

Step 3: Emergency Actions

Step 4: Termination and Follow-up

VI. General Responsibilities

Dam Owner Responsibilities

Notification and Communication Responsibilities

Evacuation Responsibilities

Monitoring, Security, Termination, and Follow-up Responsibilities

EAP Coordinator Responsibilities

VII. Preparedness

Surveillance and Monitoring

Evaluation of Detection and Response Timing

Access to the Site

Response during Periods of Darkness

Response during Weekends and Holidays

Response during Adverse Weather

Alternative Sources of Power

Emergency Supplies and Information

Stockpiling Materials and Equipment

Coordination of Information

Training and Exercise

Alternative Systems of Communication

Public Awareness and Communication

VIII. Inundation Maps

Part II: Appendices

Contents within each of these Sections will follow guidance provided in chapter II of the FEMA 64 guidelines.

Washoe County
Sierra Sage Pond Emergency Action Plan

Task	Task Description	R. Edgington Project Principal Engineer	L. Kubiak Accountant Sr	N. Laughlin Project Manager General	M. Forest Quality Control Reviewer	K. Weaver Engineer Water Resources	M. Blum Engineer Water Resources	G. Burst Engineer Water Resources	S. Lewis EIT Water Resources	Total HDR Labor Hours	Total HDR Labor (\$)	Total HDR Expenses (\$)	Subs (\$)	Total
	Rates	\$ 323.24	\$ 155.90	\$ 265.76	\$ 324.59	\$ 140.85	\$ 182.43	\$ 160.02	\$ 78.12					
Task 1 - Project Management														
1.1	Project Initiation	2	4	2						8	\$1,802	\$0		\$1,802
1.2	Invoking and Progress Tracking		4	4						8	\$1,687			\$1,687
1.3	Client Coordination			4						4	\$1,063			\$1,063
	Subtotal Task 1	2	8	10	0	0	0	0	0	20	\$4,551	\$0	\$0	\$4,551
Task 2 - Data Collection														
2.1	Data Collection					2			8	10	\$907	\$0	\$4,800	\$5,707
	Subtotal Task 2	0	0	0	0	2	0	0	8	10	\$907	\$0		\$5,707
Task 3 - Identify Triggering Events														
3.1	Identify Triggering Events			2		2	4			8	\$1,543	\$0	\$0	\$1,543
	Subtotal Task 3	0	0	2	0	2	4	0	0	8	\$1,543	\$0	\$0	\$1,543
Task 4 - ID Notification														
4.1	Identify Jurisdictions, Agencies, and Individuals			1		1				2	\$407	\$0		\$407
	Subtotal Task 4	0	0	1	0	1	0	0	0	2	\$407	\$0	\$0	\$407
Task 5 - 5. Determine the Appropriate Procedures to be Used Prior to an Emergency														
5.1	Determine Procedures			2				8	12	22	\$2,749	\$0		\$2,749
	Subtotal Task 5	0	0	2	0	0	0	8	12	22	\$2,749	\$0	\$0	\$2,749
Task 6 - Determine the Appropriate Procedures to be Used During an Emergency														
6.1	Determine Procedures			2				4	4	10	\$1,484			\$1,484
	Subtotal Task 6	0	0	2	0	0	0	4	4	10	\$1,484	\$0	\$0	\$1,484
Task 7 - Terrain Development														
7.1	Terrain Development				2	8	2			12	\$2,141	\$0		\$2,141
	Subtotal Task 7	0	0	0	2	8	2	0	0	12	\$2,141	\$0	\$0	\$2,141
Task 8 - Hydraulic Model Development														
8.1	Model Development			2	2	24	2		8	38	\$5,551		\$0	\$5,551
8.2	Dam Breach Parameterization			1	1	4	4			10	\$1,863	\$0		\$1,863
	Subtotal Task 8	0	0	3	3	28	6	0	8	48	\$7,434	\$0	\$0	\$7,434
Task 9 - Inundation Mapping														
9.1	Inundation Mapping				2	8	4			14	\$2,506	\$0		\$2,506
	Subtotal Task 9	0	0	0	2	8	4	0	0	14	\$2,506	\$0	\$0	\$2,506
Task 10 - EAP Preparation														
10.1	EAP Preparation			4				16	32	52	\$6,123	\$30		\$6,153
	Subtotal Task 10	0	0	4	0	0	0	16	32	52	\$6,123	\$30	\$0	\$6,153
	COLUMN TOTALS	2	8	24	7	49	16	28	64	199	\$29,845	\$30.00	\$4,800	\$34,675

EXHIBIT A

Scope of Services

This scope of services is intended to provide a description of the tasks anticipated with preparing an update to the Emergency Action Plan (EAP) for the Huffaker Effluent Storage Reservoir. EAPs are needed to provide early warning and notification of a dam breach or overtopping to reduce loss of life and property damage downstream of a dam. Included in an EAP are evacuation and inundation maps, and contact information for local emergency managers.

The Huffaker Effluent Storage Reservoir is located south of Alexander Lake Road and east of Double R Boulevard. The Huffaker Effluent Storage Reservoir is located in Section 33, Township 19, Range 20.

The Huffaker Effluent Storage Reservoir is considered to be "high hazard" by the State of Nevada Division of Water Resources (DWR), and therefore EAPs are required. The EAPs will be prepared using guidance from *FEMA Federal Guidelines for Dam Safety, Emergency Action Planning for Dams (FEMA 64)*, dated July 2013, as well as input from the DWR.

The following tasks are anticipated for the preparation of an EAP for the Huffaker Effluent Storage Reservoir:

1. Project Management, Coordination, Meetings

This task includes administrative and project management tasks, invoicing, monthly coordination meetings. Any proposed changes in or departures from this scope proposed by the County or initiated by HDR will be provided to the County in writing.

2. Data Collection and Field Review

HDR personnel will collect digital and paper data relevant to hydrologic and hydraulic analyses for the dam and surrounding areas, hazard mapping for the project area, inspection reports, design drawings, as-built drawings, available topographic and survey data, and etc. The data collected will be used for the analysis, model construction, and GIS mapping.

Hydrologic Information: The County will provide HDR with pertinent drainage reports, design reports, and etc. for the sediment basin and for the detention basin. HDR staff will review the hydrologic analyses prepared for the sediment basin to ensure that the hydrologic analyses were performed in keeping with proper hydrologic criteria and modeling methods. This scope assumes that no changes will need to be made to the hydrologic analyses. If updates to the hydrologic modeling are required additional fee will be required.

Terrain Data: The County will provide HDR with the most current LiDAR and rectified ortho aerial photo mapping for the project area and water course at no cost to HDR. HDR will provide the County with the LiDAR tiles needed. The LiDAR data will be used to create a terrain that will be the basis for the hydraulic models.

Supplemental survey data may be required to ensure that key features of the dam are coded into the hydraulic model correctly (i.e. top of embankment elevations, spillway elevations, low level outlet

configuration, down stream bridges/culverts, etc.). Any supplemental survey requirements identified by HDR will be provided by HDR by a subconsultant surveyor.

Soil Data: HDR will collect soils data from the Natural Resource Conservation Service's Soil Survey Geographic Database. This data will be used to verify the inputs to the hydrologic model.

Land Use: The County will provide HDR with the most current land use planning data for the project watershed in GIS format.

As-Built Information: HDR will collect as-built/design information for the reservoir and downstream roadway, culvert, and residential developments from the County as necessary.

3. Identify Trigger Events

HDR will review reservoir as-builts if available, geotechnical reports, hydrological and hydraulic/drainage reports, permits, dam inspection reports and other pertinent material available to be provided by Washoe County. HDR will visit each site to observe the potential for a failure mechanism. HDR will determine the most likely failure mechanism that would result in the most critical breach for any given area downstream of each referenced facility.

4. Identification of Jurisdictions, Agencies and Individuals Requiring Notification

HDR will work with staff from Washoe County to identify all jurisdictions, agencies and individuals requiring notification in the event of occurrence of a rupture of the dam referenced in this Scope of Work. This task will be incomplete with respect to individuals or residents of properties downstream of and in the pathway of a potential flood resulting from the rupture of the referenced dam. These properties will be identified upon completion of the inundation mapping.

5. Determine the Appropriate Procedures to be Used Prior to an Emergency

HDR will work with Washoe County personnel to document appropriate inspection and surveillance procedures to be followed prior to an emergency. HDR will work with and recommend any alterations to current schedule for site inspections to the reservoir. HDR will document existing operation and maintenance procedures and recommend any necessary alterations.

6. Determine the Appropriate Procedures to be Used During an Emergency

HDR will work with Washoe County personnel to document appropriate communications and procedures to be followed during an emergency with respect to rupture of the referenced dam structure. This includes evacuation and recovery procedures.

7. Terrain Development

It is anticipated that the US Army Corps of Engineers' HEC-RAS V5.0.3 hydraulic model will be used to develop breach hydrographs and for hydraulic routing of those flows. It will therefore be necessary to develop a digital terrain model as the geometric foundation for the hydraulic model.

Digital Terrain development will be conducted using ESRI's ArcMap capabilities using the latest Washoe County LiDAR data. It is assumed that Washoe County will provide the 2013 1 meter resolution "ground" data for the study area which is the Central Truckee Meadows LiDAR tile. These data are assumed to be in NAD83 State Plane Feet projection with a vertical datum of NAVD88. HDR staff will use the ground classified LiDAR points to create a Triangular Irregular Network (TIN) which will then be converted to a raster dataset at a 1-2 ft. resolution for ingestion to HEC-RAS. It is assumed that channel bathymetry and any supplemental topographic data is not required for the level of detail required by the EAP. The terrain dataset will represent the existing conditions in 2013 as captured by the processed Ground Points. Minimal terrain corrections or processing will be conducted. The terrain will be an "as is" condition.

If data is readily available, building footprints will be added to the terrain as elevated features to simulate the behavior of the blocked obstructions in the model.

8. Hydraulic Model Development

Given the urban nature of the consequence area for the Huffaker Reservoir, an unsteady-state two dimensional (2D) model has been chosen for analysis. The US Army Corps of Engineers' HEC-RAS V5.0.3 hydraulic model has the capability to model 2D flow in a structured/unstructured mesh and provide detailed mapping and hydraulic output information. This version of HEC-RAS also has the capability to simulate dam breach progressions and route the resulting breach hydrograph through the model domain, allowing better characterization of unpredictable divided flow.

a. Model development

The modeling domain for the Huffaker Effluent Storage Reservoir and consequence area will begin at the upstream extent of the respective reservoir and terminate at the Truckee River or at a logical downstream limit agreeable to the County. The reservoir volume will be captured by the 2D modeling domain.

It is anticipated that the Breach Models will be full 2D models for ease of run, stability, connectivity and consistency of approach. The model domain will be developed in GIS as a polygon layer capturing the largest potential consequence area. The model domain will incorporate breakline data as appropriate to capture hydraulically relevant high points in the terrain such as roadway crowns or structure overtopping sections.

After the model domain geometry has been completed, inflow locations will be determined from previous hydrologic modeling efforts and added to the domain. An appropriate downstream boundary condition will be added at the Truckee River.

Currently, HEC-RAS does not have the capability to model bridges in the 2D domain. Major structures that impact hydraulic behavior will be added to the model as culverts. HDR staff will inspect all 3 previous models to determine which structures should be added to the model and incorporate those as culverts. The model will be run to determine hydraulic performance of the structures so that they can be

compared to the performance of their counterparts in the 1D models. "Bridge" culverts will then be modified to approximate the hydraulic behavior of the bridges.

Manning's n values will be developed for the modeling area using aerial photos, field photos and GIS capabilities. Areas of homogeneous land use will be digitized as a land use layer for inclusion into the 2D modeling area. Once land use zones have been digitized, the methods described in USGS Water-Supply Paper 2933, HDR developed Manning's roughness (" n ") values for the channel and overbank regions (Arcement & Schneider, 1989) will be used to estimate roughness values.

It is anticipated that the model will be run in Full Momentum computation mode with default options and tolerances. The model will be run for the "Sunny Day" event only. It is anticipated that the Sunny Day event will be run with a piping breach scenario only.

b. Dam Breach Parameterization

One of the most crucial elements of Dam Breach modeling and hazard identification is the selection of dam breach parameters. There are several different failure models and many different methodologies for estimating physical breach characteristics and breach progression timing. The embankment material, failure location and failure mode all play crucial roles in determining the ultimate breach and resulting hydrograph impacting the consequence area.

The two main failure modes for breach analyses are overtopping and piping failure. Both of these modes will be investigated for this study. Empirical relationships have been developed for a variety of dam types relating dam breach parameters, including timing, with physical characteristics of the embankment and relative water levels. These methods are all described in the US Army Corps of Engineers' guidance document *Using HEC-RAS for Dam Break Studies* (2014). This document will be used for general guidance along with other appropriate dam breach publications from sources like the US Bureau of Reclamation (US BoR), USDA Natural Resource Conservation Service (NRCS), and the Federal Emergency Management Agency (FEMA).

It is anticipated that the primary regulatory guidance will be FEMA 64 (July 2013) Federal guidelines for Dam Safety. Breach modeling will also be subject to State of Nevada Divisions of Water Resources guidelines and dam safety regulations outlined in Nevada Revised Statute (NRS) 535.

9. Inundation Mapping

Following breach hydrograph development and associated flood routing, the results of the hydraulic modeling will be processed in HEC-RAS Mapper for incorporation into hazard maps. Inundation mapping shall include the following elements:

- North arrow and bar scale
- Clearly labeled inundation areas
- Qualification stating that the hazard areas may differ during an actual dam failure event
- Roads drainages and other landmarks are clearly displayed
- Critical facilities identified

- Logical downstream limits
- “Cross sections” taken at critical locations (for 2D modeling the use of a flux line will replace traditional cross sections).
- Flood inundation information includes; peak flood stage, flood wave arrival time, maximum water surface elevation, peak discharge, and depth times velocity.

10. EAP Preparation

FEMA 64 has guidelines and suggestions for the development of EAPs. The suggested outline for an EAP includes two parts, Part I “EAP Information and Appendices. Within Part I there are eight subsections recommendations. The EAP will follow this format as summarized below:

Part I: EAP Information

I. Summary of EAP Responsibilities

II. Notification Flowcharts

III. Statement of Purpose

IV. Project Description

V. EAP Response Process

Step 1: Incident Detection, Evaluation, and Emergency Level Determination

Step 2: Notification and Communication

Step 3: Emergency Actions

Step 4: Termination and Follow-up

VI. General Responsibilities

Dam Owner Responsibilities

Notification and Communication Responsibilities

Evacuation Responsibilities

Monitoring, Security, Termination, and Follow-up Responsibilities

EAP Coordinator Responsibilities

VII. Preparedness

Surveillance and Monitoring

Evaluation of Detection and Response Timing

Access to the Site

Response during Periods of Darkness

Response during Weekends and Holidays

Response during Adverse Weather

Alternative Sources of Power

Emergency Supplies and Information

Stockpiling Materials and Equipment

Coordination of Information

Training and Exercise

Alternative Systems of Communication

Public Awareness and Communication

VIII. Inundation Maps

Part II: Appendices

Contents within each of these Sections will follow guidance provided in chapter II of the FEMA 64 guidelines.

Washoe County
Huffaker Effluent Reservoir Emergency Action Plan

Task No.	Task Description	R. Edgington Project Principal Engineer	L. Kublak Accountant Sr	N. Laughlin Project Manager General	M. Forest Quality Control Reviewer	K. Weaver Engineer Water Resources	M. Blum Engineer Water Resources Sr	G. Bursi Engineer Water Resources	S. Lewis EIT Water Resources	Total HDR Labor Hours	Total HDR Labor (\$)	Total HDR Expenses (\$)	Subs (\$)	Total Cost (\$)
Rates		\$ 323.24	\$ 155.00	\$ 265.76	\$ 324.59	\$ 140.85	\$ 182.43	\$ 160.02	\$ 76.12					
Task 1 - Project Management														
1.1	Project Initiation	2	4	2						8	\$1,802	\$0		\$1,802
1.2	Invoicing and Progress Tracking		4	4						8	\$1,697			\$1,697
1.3	Client Coordination			4						4	\$1,063			\$1,063
	Subtotal Task 1	2	8	10	0	0	0	0	0	20	\$4,551	\$0	\$0	\$4,551
Task 2 - Data Collection														
2.1	Data Collection					4			8	12	\$1,188	\$0	\$4,200	\$5,388
	Subtotal Task 2	0	0	0	0	4	0	0	8	12	\$1,188	\$0		\$5,388
Task 3 - Identify Triggering Events														
3.1	Identify Triggering Events			2		2	4			8	\$1,543	\$0	\$0	\$1,543
	Subtotal Task 3	0	0	2	0	2	4	0	0	8	\$1,543	\$0	\$0	\$1,543
Task 4 - ID Notification														
4.1	Identify Jurisdictions, Agencies, and Individuals			1		1				2	\$407	\$0		\$407
	Subtotal Task 4	0	0	1	0	1	0	0	0	2	\$407	\$0	\$0	\$407
Task 5 - Determine the Appropriate Procedures to be Used Prior to an Emergency														
5.1	Determine Procedures			2				8	12	22	\$2,749	\$0		\$2,749
	Subtotal Task 5	0	0	2	0	0	0	8	12	22	\$2,749	\$0	\$0	\$2,749
Task 6 - Determine the Appropriate Procedures to be Used During an Emergency														
6.1	Determine Procedures			2				4	4	10	\$1,484	\$0		\$1,484
	Subtotal Task 6	0	0	2	0	0	0	4	4	10	\$1,484	\$0	\$0	\$1,484
Task 7 - Terrain Development														
7.1	Terrain Development				4	24	4			32	\$5,409	\$0		\$5,409
	Subtotal Task 7	0	0	0	4	24	4	0	0	32	\$5,409	\$0	\$0	\$5,409
Task 8 - Hydraulic Model Development														
8.1	Model Development			2	4	40	12		8	66	\$10,278	\$0	\$0	\$10,278
8.2	Dam Breach Parameterization			1	1	4	4			10	\$1,883	\$0		\$1,883
	Subtotal Task 8	0	0	3	5	44	16	0	8	76	\$12,162	\$0	\$0	\$12,162
Task 9 - Inundation Mapping														
9.1	Inundation Mapping				2	16	4			22	\$3,633	\$0		\$3,633
	Subtotal Task 9	0	0	0	2	16	4	0	0	22	\$3,633	\$0	\$0	\$3,633
Task 10 - EAP Preparation														
10.1	EAP Preparation			4				16	32	52	\$5,123	\$30		\$5,153
	Subtotal Task 10	0	0	4	0	0	0	16	32	52	\$5,123	\$30	\$0	\$5,153
COLUMN TOTALS												\$30,000	\$4,200	\$34,278

EXHIBIT B



HDR Engineering, Inc. STANDARD RATE SCHEDULE January – December 2017

Washoe County DAM EAPs

Classification	Rate
Drafter I	97.00
Drafter II	108.00
Drafter III	122.00
CADD Technician I	140.00
CADD Technician II	155.00
CAD / GIS Analyst	162.00
EIT Water Resources	76.00
Engineer Water Resources I	137.00
Engineer Water Resources II	155.00
Engineer Water Resources Sr.	177.00
Staff Engineer I	95.00
Staff Engineer II	110.00
Staff Engineer III	120.00
Project Engineer I	141.00
Project Engineer II	167.00
Project Engineer III	195.00
Technical Specialist I	245.00
Technical Specialist II	275.00
Technical Specialist III	290.00
Project Manager General	258.02
Project Principal Engineer	315.00
Quality Control Reviewer	315.00
Project Coordinator I	54.00
Project Coordinator II	80.00
Project Coordinator III	95.00
Accountant	139.00
Accountant Sr.	151.00
EXPENSES:	
Vehicle Mileage (Per Mile)	FTR – Federal
Reproduction	at cost
Subconsultants Markup	5%

Exhibit C

**INSURANCE, HOLD HARMLESS AND INDEMNIFICATION REQUIREMENTS FOR
CONSULTANT PROFESSIONAL SERVICE AGREEMENTS
PREPARATION OF EMERGENCY ACTION PLAN (EAP)
FOR WASHOE COUNTY'S HIGH HAZARD DAMS FOR
(1) NORTH SPANISH SPRINGS SEDIMENT BASIN & UPDATE EAP FOR SPANISH SPRINGS
FLOOD DETENTION BASIN PROJECT; (2) HERMAN DAM; (3) SIERRA SAGE POND AT
THE SIERRA SAGE GOLF COURSE; AND (4) HUFFAKER EFFLUENT STORAGE
RESERVOIR**

INDEMNIFICATION**CONSULTANT Liability**

As respects acts, errors or omissions in the performance of CONSULTANT services, CONSULTANT agrees to indemnify and hold harmless COUNTY, its officers, agents, employees, and volunteers from and against any and all claims, demands, defense costs, or liability to the extent caused by CONSULTANT'S negligent acts, errors or omissions in the performance of its CONSULTANT services under the terms of this agreement.

CONSULTANT further agrees to defend COUNTY and assume all costs, expenses and liabilities of any nature to which COUNTY may be subjected as a result of any claim, demand, action or cause of action to the extent caused by and arising out of the negligent acts, errors or omissions of CONSULTANT or its Sub-consultant in the performance of their CONSULTANT services under the Agreement.

Neither Party to this Agreement shall be liable to the other Party for any special, incidental, indirect, or consequential damages (including but not limited to loss of profits or revenue; loss of use or opportunity; loss of good will; cost of substitute facilities, goods, or services; and/or cost of capital) arising out of, resulting from, or in any way related to the Project or the Agreement from any cause or causes.

General Liability

As respects all acts or omissions which do not arise directly out of the performance of CONSULTANT services, including but not limited to those acts or omissions normally covered by general and automobile liability insurance, CONSULTANT agrees to indemnify, defend (at COUNTY'S option), and hold harmless COUNTY, its officers, agents, employees, and volunteers from and against any and all claims, demands, defense costs, or liability arising out of any acts or omissions of CONSULTANT (or Sub-consultant, if any) while acting under the terms of this agreement; excepting those which arise out of the negligence of COUNTY.

In determining the nature of the claim against COUNTY, the incident underlying the claim shall determine the nature of the claim, notwithstanding the form of the allegations against COUNTY.

GENERAL REQUIREMENTS

COUNTY requires that CONSULTANT purchase Industrial Insurance (Workers' Compensation), General and Auto Liability, and CONSULTANT'S Errors and Omissions Liability Insurance as described below against claims for injuries to persons or damages to property which may arise from or in connection with the performance of the work here under by CONSULTANT, its agents, representatives, employees or Sub-consultants. The cost of all such insurance shall be borne by CONSULTANT.

INDUSTRIAL INSURANCE

It is understood and agreed that there shall be no Industrial Insurance coverage provided for CONSULTANT or any Sub-consultant by COUNTY. CONSULTANT agrees, as a precondition to the performance of any work under this Agreement and as a precondition to any obligation of the COUNTY to make any payment under this Agreement to provide COUNTY with a certificate issued by an insurer in accordance with NRS 616B.627 and NRS 617.210.

If CONSULTANT or Sub-consultant is a sole proprietor, coverage for the sole proprietor must be purchased and evidence of coverage must appear on the Certificate of Insurance. Such requirement may be waived for a sole proprietor who does not use the services of any employees, subcontractors, or independent contractors and completes an Affirmation of Compliance pursuant to NRS 616B627.

Should CONSULTANT be self-funded for Industrial insurance, CONSULTANT shall so notify COUNTY in writing prior to the signing of any agreement. COUNTY reserves the right to approve said retentions and may request additional documentation, financial or otherwise for review prior to the signing of any agreement.

MINIMUM LIMITS OF INSURANCE

CONSULTANT shall maintain coverage and limits no less than:

1. General Liability: \$1,000,000 per claim for bodily injury, personal injury and property damage. If Commercial General Liability Insurance or other form with a general aggregate limit is used, the general aggregate limit shall be increased to equal twice the required occurrence limit or revised to apply separately to this project or location.
2. Automobile Liability: \$1,000,000 combined single limit per claim for bodily injury and property damage. No aggregate limit may apply.
3. CONSULTANT Errors and Omissions Liability: \$1,000,000 per claim and as an annual aggregate. Premium costs incurred to increase CONSULTANT'S insurance levels to meet minimum contract limits shall be borne by the CONSULTANT at no cost to the COUNTY.

CONSULTANT will maintain CONSULTANT liability insurance during the term of this Agreement and for a period of three (3) years from the date of substantial completion of the project. In the event that CONSULTANT goes out of business during the term of this Agreement or the three (3) year period described above, CONSULTANT shall purchase Extended Reporting Coverage for claims arising out of CONSULTANT'S negligent acts, errors and omissions committed during the term of the CONSULTANT Liability Policy.

Should COUNTY and CONSULTANT agree that higher CONSULTANT Coverage limits are needed warranting a project policy, project coverage shall be purchased and the premium for limits exceeding the above amount shall be borne by COUNTY. COUNTY retains the option to purchase project insurance through CONSULTANT'S insurer or its own source.

DEDUCTIBLES AND SELF-INSURED RETENTIONS

Any deductibles or self-insured retentions must be declared to and approved by the COUNTY Risk Management Division prior to the start of work under this Agreement. COUNTY reserves the right to request additional documentation, financial or otherwise prior to giving its approval of the deductibles and self-insured retention and prior to executing the underlying agreement. Any changes to the deductibles or self-insured retentions made during

the term of this Agreement or during the term of any policy must be approved by the COUNTY Risk Manager prior to the change taking effect.

OTHER INSURANCE PROVISIONS

The policies are to contain, or be endorsed to contain, the following provisions:

1. General Liability Coverages

- a. COUNTY, its officers, agents, employees and volunteers are to be covered as additional insureds as respects: liability arising out of activities performed by or on behalf of CONSULTANT, including the insured's general supervision of CONSULTANT; products and completed operations of CONSULTANT; or premises owned, occupied or used by CONSULTANT. The coverage shall contain no special limitations on the scope of protection afforded to the additional insureds, nor shall the rights of the additional insured be affected by the insured's duties after an accident or loss.
- b. CONSULTANT'S insurance coverage shall be primary insurance as respects COUNTY, its officers, agents, employees and volunteers. Any insurance or self-insurance maintained by COUNTY, its officers, agents, employees or volunteers shall be excess of CONSULTANT'S insurance and shall not contribute with it in any way.
- c. Any failure to comply with reporting provisions of the policies shall not affect coverage provided to COUNTY, its officers, agents, employees or volunteers.
- d. CONSULTANT'S insurance shall apply separately to each insured against whom claim is made or suit is brought, except with respect to the limits of the insurer's liability.
- e. CONSULTANT'S insurance coverage shall be endorsed to state that coverage shall not be suspended, voided, canceled or non-renewed by either party, reduced in coverage or in limits except after thirty (30) days' prior written notice by certified mail, return receipt requested, has been given to COUNTY except for nonpayment of premium.

ACCEPTABILITY OF INSURERS

Insurance is to be placed with insurers with a Best's rating of no less than A-: VII. COUNTY with the approval of the Risk Manager may accept coverage with carriers having lower Best's ratings upon review of financial information concerning CONSULTANT and insurance carrier. COUNTY reserves the right to require that the CONSULTANT'S insurer be a licensed and admitted insurer in the State of Nevada, or on the Insurance Commissioner's approved but not admitted list.

VERIFICATION OF COVERAGE

CONSULTANT shall furnish COUNTY with certificates of insurance and with original endorsements affecting coverage required by this exhibit. The certificates and endorsements for each insurance policy are to be signed by a person authorized by that insurer to bind coverage on its behalf. The certificates are to be on forms approved by COUNTY. All certificates and endorsements are to be addressed to the specific COUNTY contracting department and be received and approved by COUNTY before work commences. COUNTY reserves the right to require complete, certified copies of all required insurance policies, at any time.

SUB-CONSULTANTS

CONSULTANT shall include all Sub-consultants as insureds under its policies or furnish separate certificates and endorsements for each Sub-consultant. Sub-consultant shall be subject to all of the requirements stated herein.

MISCELLANEOUS CONDITIONS

1. CONSULTANT shall be responsible for and remedy all damage or loss to any property, including property of COUNTY, caused in whole or in part by CONSULTANT, any Sub-consultant, or anyone employed, directed or supervised by CONSULTANT.
2. Nothing herein contained shall be construed as limiting in any way the extent to which CONSULTANT may be held responsible for payment of damages to persons or property resulting from its operations or the operations of any Sub-consultants under it.
3. In addition to any other remedies COUNTY may have if CONSULTANT fails to provide or maintain any insurance policies or policy endorsements to the extent and within the time herein required, COUNTY may, at its sole option:
 - a. Order CONSULTANT to stop work under this Agreement and/or withhold any payments which become due CONSULTANT here under until CONSULTANT demonstrates compliance with the requirements hereof;
 - b. Terminate the Agreement.