Peer Review Summary Document

(03/26/2020)

Peer Review Plan

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Title and Authorship of Information Product Disseminated

Geophysical surveys, hydrogeologic characterization, and groundwater flow model for the Truxton Basin and Hualapai Plateau, northwestern Arizona, By Jon Mason, Jacob Knight, Lyndsay Ball, Jeffrey Kennedy, Donald Bills, and Jamie Macy.

Peer Reviewers Expertise and Credentials

Reviewer #1 holds an M.S. and Ph.D. in geosciences and has 30 years of experience in geologic mapping of fluvial and lacustrine systems in the deserts of Arizona, Nevada, California, and Oregon. The reviewer's focus has been on issues relating to long-term evolution of surficial geologic systems in those regions, involving field observation, mapping, characterization, and research of regional stratigraphy, sedimentology, and geomorphology.

Reviewer #2 holds an M.S. in hydrology and B.S. in geology and has an extensive background in groundwater hydrologic characterization and numerical modeling of surface-water and groundwater flow. The reviewer's focus has been on developing integrated hydrologic models of geological basins in the southwestern United States to inform water-resource management.

Reviewer #3 holds a Ph.D. in geophysics, with a focus on geologic interpretation of potential field (gravity and magnetic) data. The reviewer has extensive experience in 3D gravity modeling of basin geometry, geologic interpretation in areas of extreme topographic relief, interpretation in areas where the rocks of interest are completely concealed, and design of airborne magnetic and gravity gradient surveys.

Reviewer #4 holds an M.S. in atmospheric science and has wide ranging experience in groundwater and geophysical techniques including conducting and evaluating gravity surveys as a means to determine aquifer storage change. The reviewer has also worked in and around the Truxton Basin study area and elsewhere on the Colorado Plateau, conducting hydrologic studies and applying geophysical techniques.

Reviewer #5 holds an M.S. in geology and is an expert on Colorado Plateau and Basin and Range geology. The reviewer is coauthor of a publication on the hydrogeologic framework and groundwater estimates for basins downstream from Truxton Valley and the senior author of the accompanying geologic map publication.

Reviewer #6 holds M.S. and Ph.D. degrees in applied geophysics. The reviewer has 25 years' experience working as a research geophysicist specializing in interpretation and inversion of airborne electromagnetic surveys, particularly in areas of groundwater resources and subsurface contaminant transport.

Reviewer #7 holds an M.S. in hydrology and has a background in groundwater and integrated hydrologic modeling.

Reviewer #8 holds a B.S. in civil engineering and is a part-time groundwater specialist for a USGS water science center. The reviewer has over three decades experience conducting numerous

investigations from site-specific issues to regional-scale assessments in complex hydrogeologic settings in the temperate northeast and the arid southwestern United States.

Charge Submitted to Peer Reviewers

The reviewers were asked to objectively evaluate the study methods, results, and interpretive conclusions described in the manuscript.

Summary of Peer Reviewers Comments and USGS Response to Peer Reviewers Comments

Each reviewer provided specific comments to help improve presentation and readability of the manuscript, as well as a variety of editorial suggestions. The authors incorporated a vast majority of these comments and editorially related suggestions into the revised manuscript. Below are summaries of comments and suggestions from the reviewers and the responses to them.

Reviewer #1 made several suggestions regarding the visual appearance of the figures and how to improve their effectiveness. The reviewer also provided numerous editorial comments to improve clarity and readability of the manuscript, particularly for the section of the manuscript describing the geology of the Grand Canyon region.

> ***Response to Comments:*** *Text was revised for clarity to reduce possible confusion about the study area and geology of the Hualapai Indian Reservation. All editorial comments and suggestions were accepted.*

Reviewer #2 recommended using consistent terminology and naming conventions; cross checked for inconsistencies between the citations in the text and the References list; made suggestions to improve the figures; and provided numerous editorial comments.

> ***Response to Comments:*** *The authors revised text for clarification as recommended and accepted all the reviewer's editorial comments and suggestions.*

Peer Reviewer #3 suggested using a different geophysical software for processing the data and suggested applying the minimum curvature method, rather than the kriging method. The reviewer recommended using a simpler approach instead of a more precise, but otherwise less standard approach, for geophysical gravity reduction. Numerous editorial comments were also suggested by the reviewer, including a request to provide more geologic context.

> ***Response to Comments:*** *In response to the reviewer's suggestion to display the analysis using a different geophysical software package, the authors consulted with the software developers and learned that the software package proposed by the reviewer is unpublished, difficult to obtain, and not used outside a select group of researchers. Therefore, the original commercially available inversion software was retained. In response to the reviewer's recommendation that more geologic context be provided to improve the reader's understanding, the authors strengthened and clarified the geologic background content throughout the manuscript. The minimum curvature method replaced the kriging method for spatial interpolation as suggested by the reviewer. The choice of gravity reduction formulas has little impact on the relatively small study area; therefore, the original, more precise formulas were retained for consistency with previous reports by the authors. Most of the reviewer's editorial comments and suggestions were accepted.*

Peer Reviewer #4 provided numerous editorially related suggestions to improve the manuscript.

> ***Response to Comments:*** *The authors accepted most reviewer's editorial suggestions as they deemed appropriate for clarification.*

Peer Reviewer #5 provided numerous recommendations on how to better communicate the geologic interpretations, particularly in context to the existing literature and geologic maps of the study area. The reviewer also provided various editorial suggestions.

> ***Response to Comments:*** *More direct discussion of the geophysical results and interpretation, in the context of the existing literature and maps, was added as recommended by the reviewer. Most of the reviewer's editorial comments and suggestions were accepted.*

Peer Reviewer #6 commented that the geophysical processing and modeling approach was technically sound and provided numerous editorial comments and suggestions related to effectively communicating the geophysical results.

> ***Response to Comments:*** *The authors accepted most of the reviewer's editorial comments and suggestions.*

Peer Reviewer #7 recommended the creation of an abstract for the modeling portion of the manuscript and commented that better use of references to explain the conceptual model of the hydrogeologic framework of the study area would benefit the reader.

> ***Response to Comments:*** *A new abstract was created, and additional reference citations were included in the manuscript in response to the reviewer's comments. Most of the reviewer's editorial comments and suggestions were accepted.*

Peer Reviewer #8: suggested adding all the geographic features mentioned in the text to the appropriate figures; offered improvements to the text describing the specifics of the uncertainty analysis; and suggested that the addition of particle tracking to the groundwater model would benefit some readers. Numerous editorial comments and suggestions to improve the manuscript were also suggested.

> ***Response to Comments:*** *The authors added appropriate geographic features discussed in the text to the related figures and clarified the language describing the uncertainty analysis. No change was made in response to the reviewer's suggestion to add particle tracking to the groundwater model. The authors pointed out that the objective of the groundwater model was to assess water-level impacts from possible future pumping scenarios and while particle tracking might be useful in showing travel times or possible water-quality issues, neither of these objective were pertinent nor relevant to the study as scoped in the current manuscript. The authors accepted most editorial comments and suggestions as they deemed appropriate for improving manuscript clarity.*

The Dissemination

The published information product will be released as a USGS Scientific Investigations Report series publication and will be available at https://pubs.usgs.gov/.