Nevada
Environmental
Restoration
Project

DOE/NV--1312-Rev. 2

National Nuclear Security Administration

Phase II Corrective Action Investigation Plan for Corrective Action Units 101 and 102: Central and Western Pahute Mesa, Nevada Test Site, Nye County, Nevada

Controlled Copy No.: ___
Revision No.: 2

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Approved for public release; further dissemination unlimited.

Environmental Restoration
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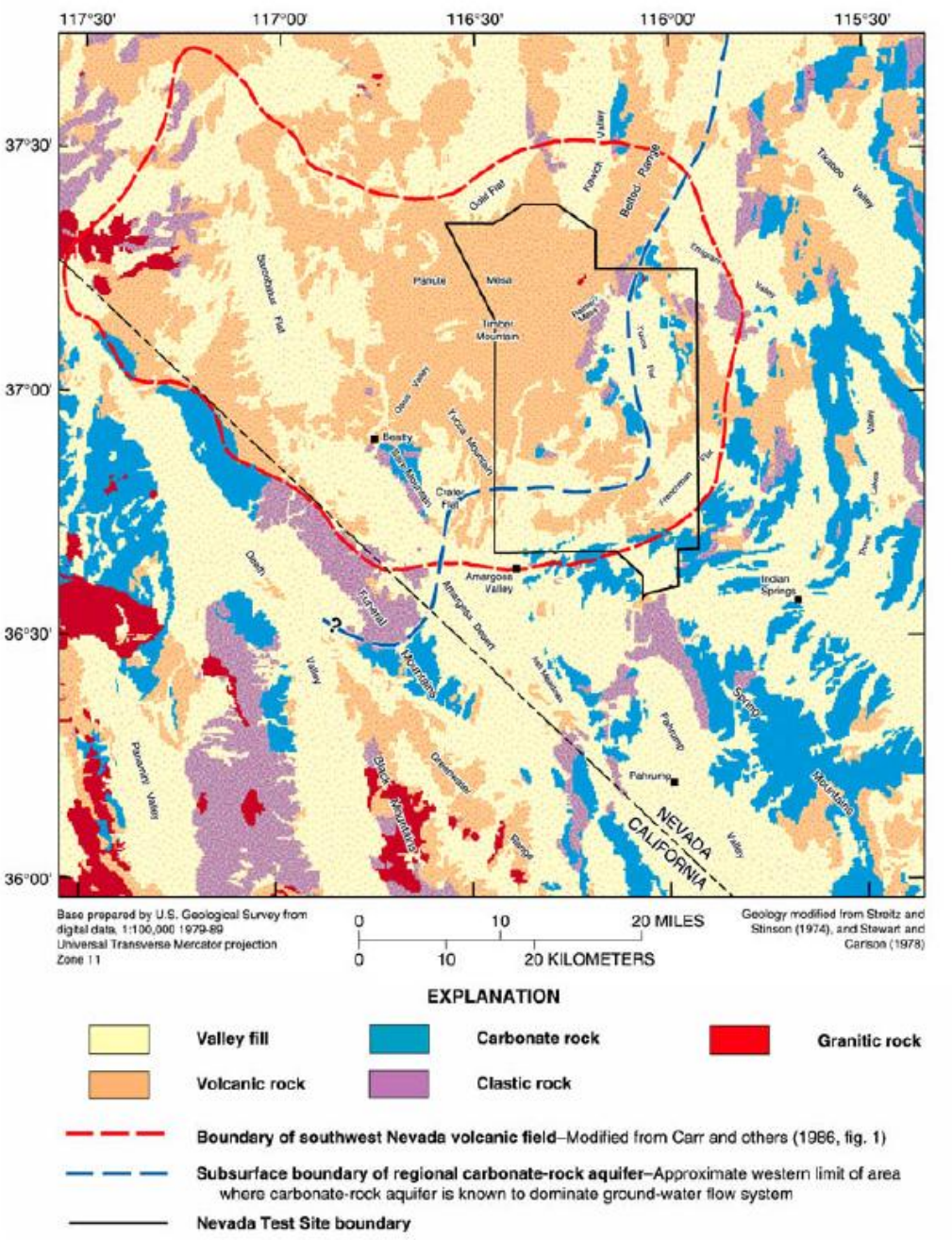
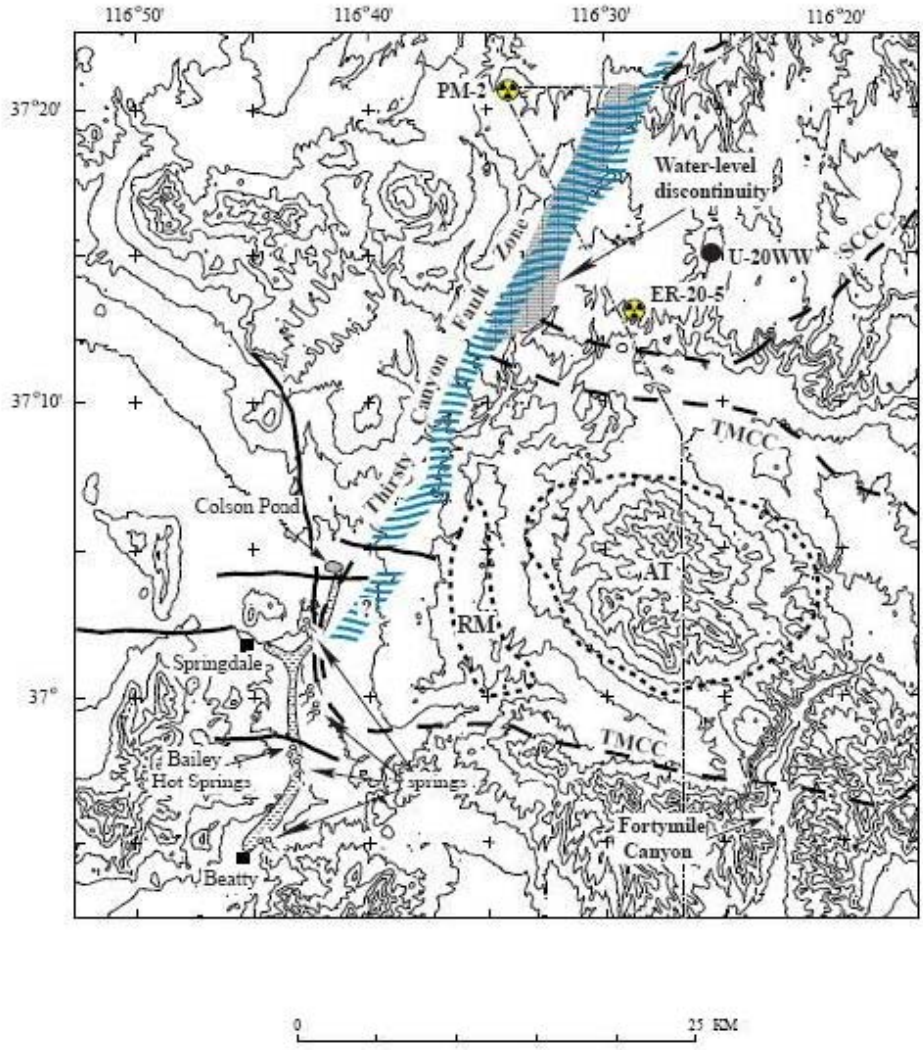
U.S. Department of Energy
National Nuclear Security Administration
Nevada Site Office

Figure 2: Surface distribution of rocks in and near Nevada Test Site



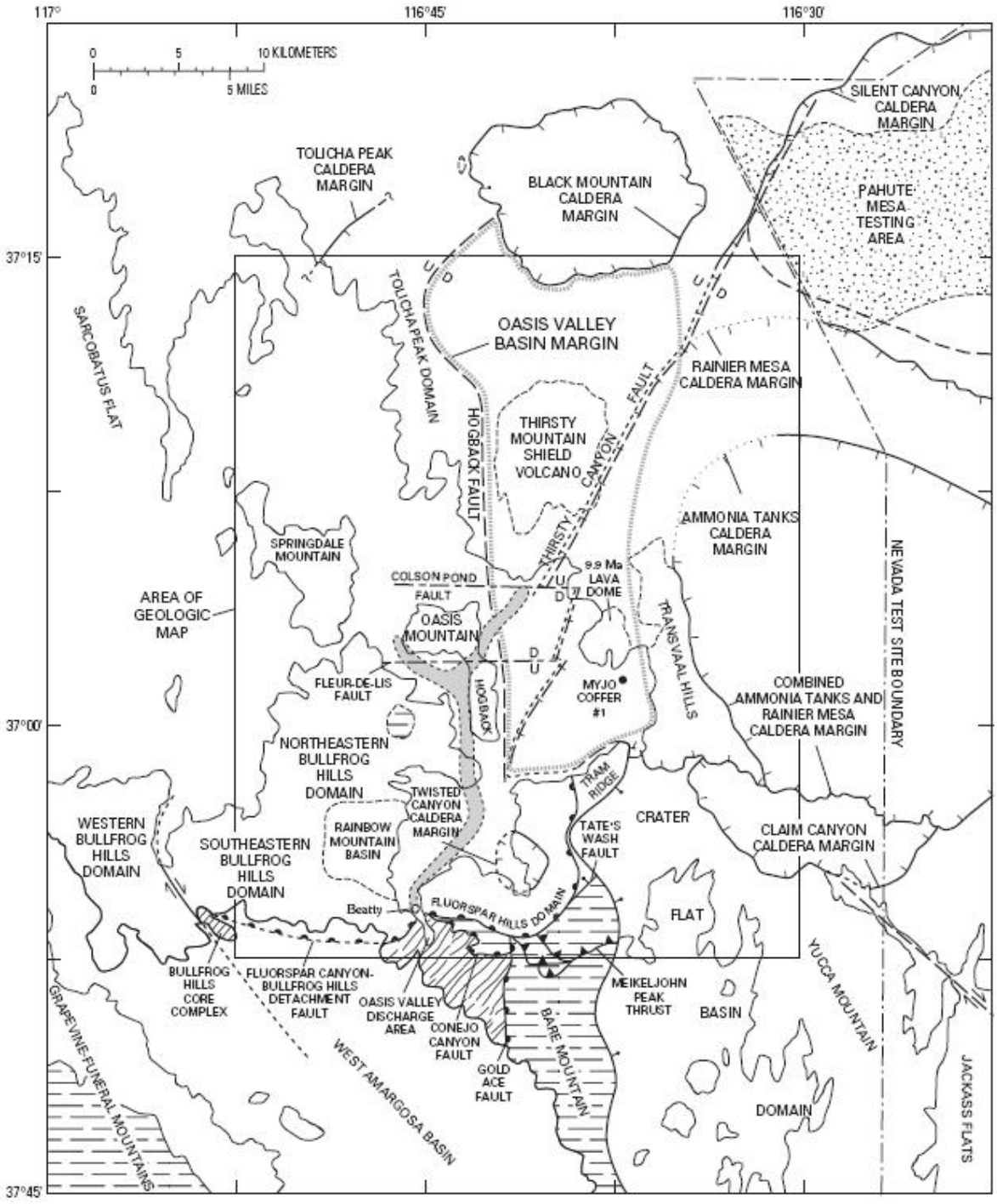
Source: Randell J. Laczniak, James C. Cole, David A. Sawyer, and Douglas A. Trudeau.(1996) Summary of Hydrogeologic Controls on Ground-Water Flow at the Nevada Test Site, Nye County, Nevada, U.S. Geological Survey, Water-Resources Investigations Report 96-4109, prepared in cooperation with the Office of Environmental Restoration and Waste Management, U.S. Department of Energy Nevada Operations Office, under Interagency Agreement DE-A108 91NV11040 last downloaded from website http://pubs.usgs.gov/wri/wri964109/report.htm#HDR0 on August 12, 2007.

Figure 3: Map showing major features expressed by geophysical data.



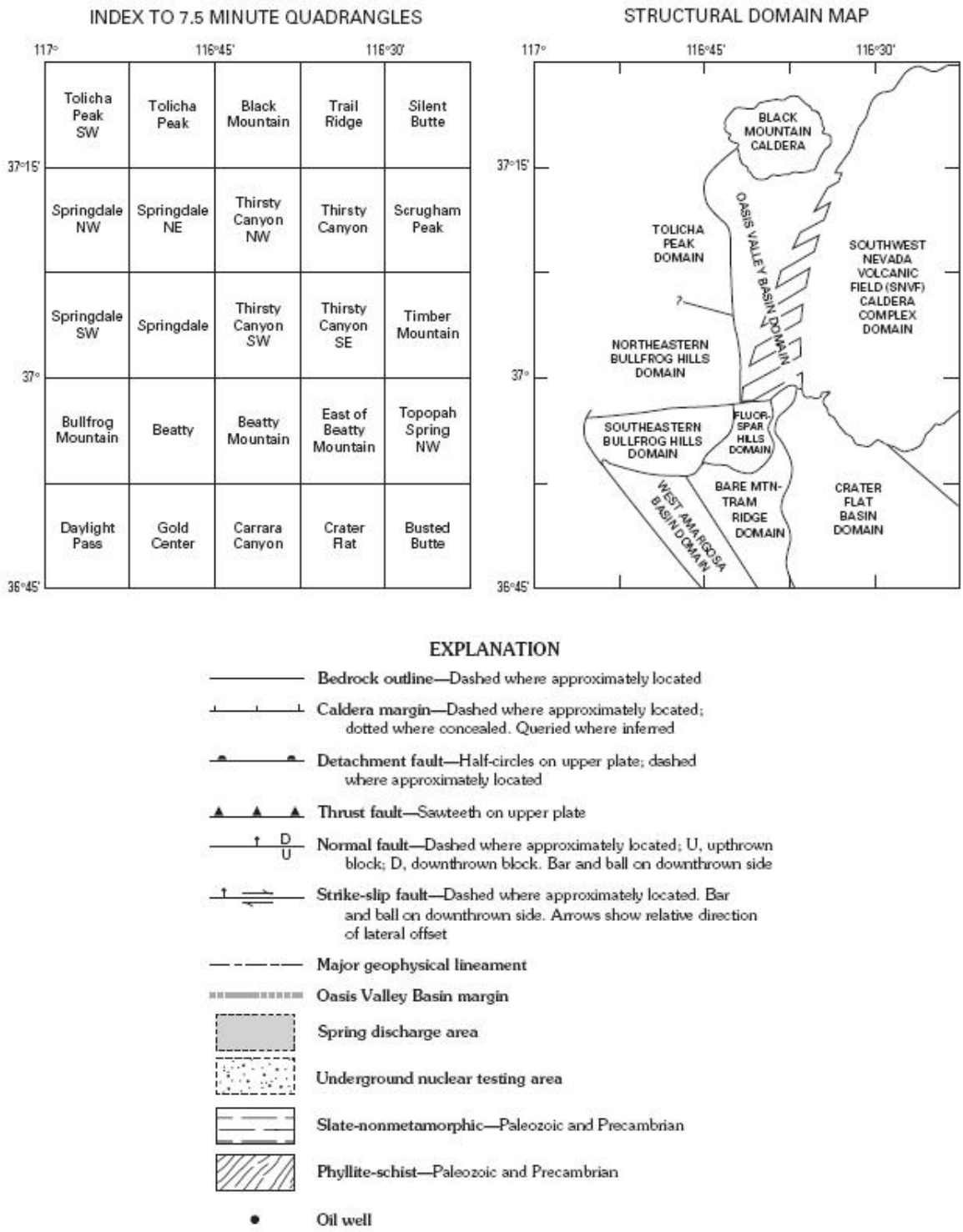
Source: Edward A. Mankinen, Hildenbrand, Fridrich, McKee, and Schenkel, (2003) Geophysical Setting of the Pahute Mesa-Oasis Valley Region Southern Nevada, Nevada Bureau of Mines and Geology, Report 50. “Figure 16… ..inferred position of the Thirsty Canyon fault zone (wavy pattern, queried where uncertain….)…and major springs in the Oasis Valley discharge area. Solid circle, water well; symbols, wells with radioactive contamination. Contour interval 100 m.”

Figure 4: Index map of the Oasis Valley basin and vicinity showing the Pahute Mesa testing area, Oasis Valley spring-discharge area, caldera outlines and selected faults.



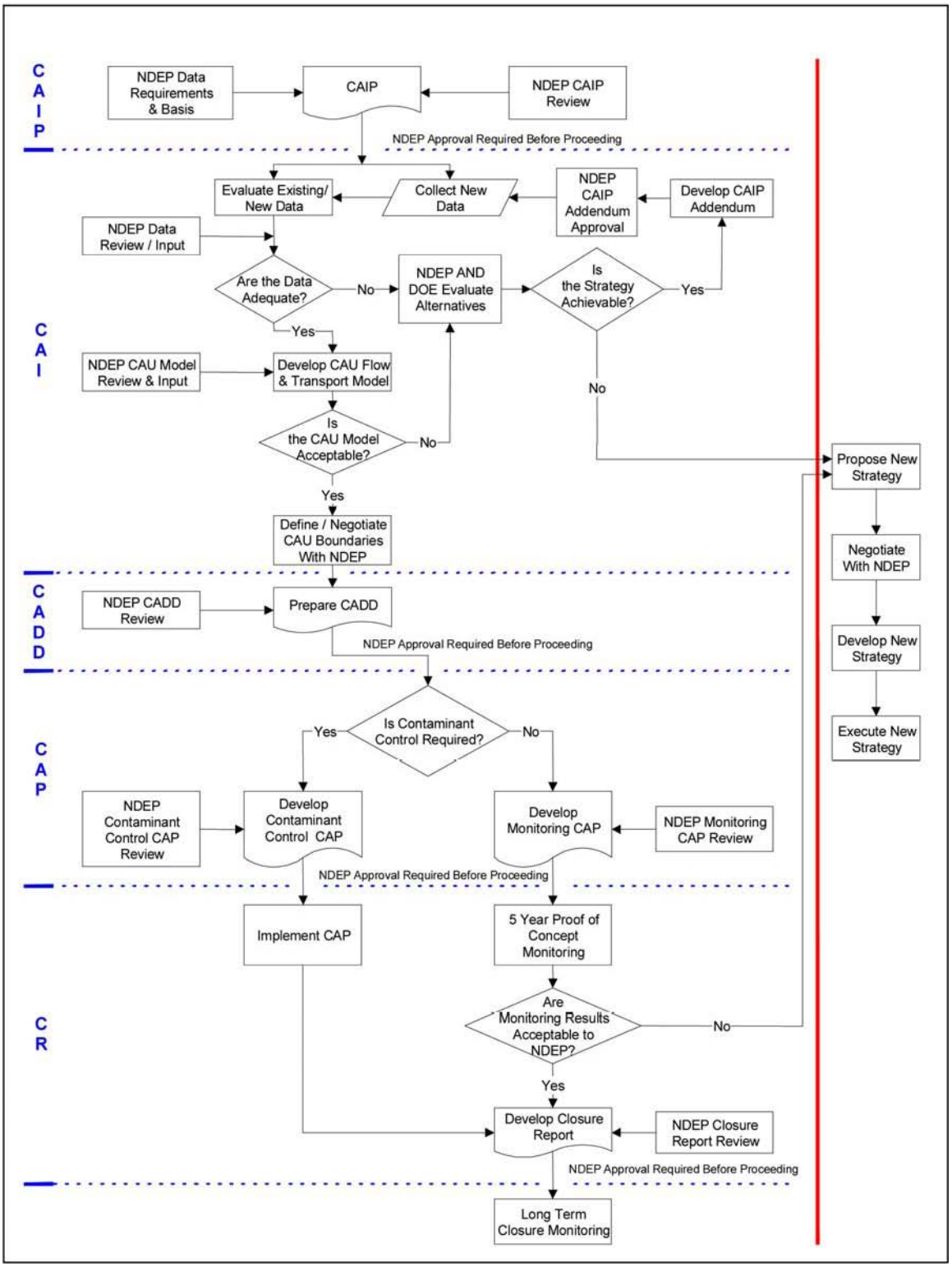
Source: Fridrich, C.J., Minor, S.A., Slate, J.L., and Ryder, P.L., 2007, Geologic map of Oasis Valley spring-discharge area and vicinity, Nye County, Nevada: U.S. Geological Survey Scientific Investigations Map 2957, 25 p., scale 1:50,000 last downloaded on August 12, 2007 from http://pubs.usgs.gov/sim/2007/2957/.

Figures 4a and 4b: 25 quandrangles of Figure 4 and a structural domain map of the area.



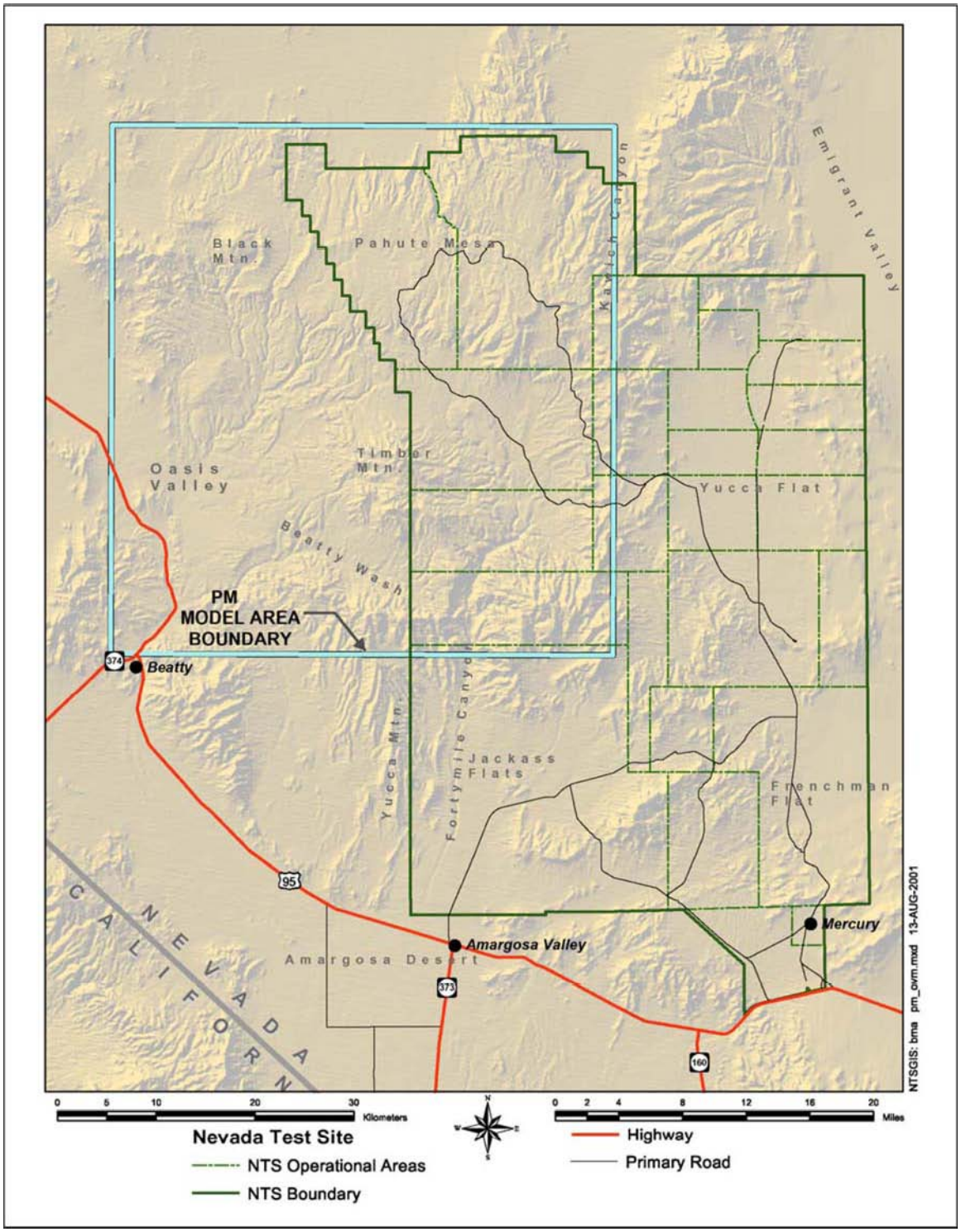
Source: Fridrich, C.J., Minor, S.A., Slate, J.L., and Ryder, P.L., 2007, Geologic map of Oasis Valley spring-discharge area and vicinity, Nye County, Nevada: U.S. Geological Survey Scientific Investigations Map 2957, 25 p., scale 1:50,000 last downloaded on August 12, 2007 from http://pubs.usgs.gov/sim/2007/2957/.

Figure 5: Flow Diagram for the Underground Test Area Corrective Action Units.



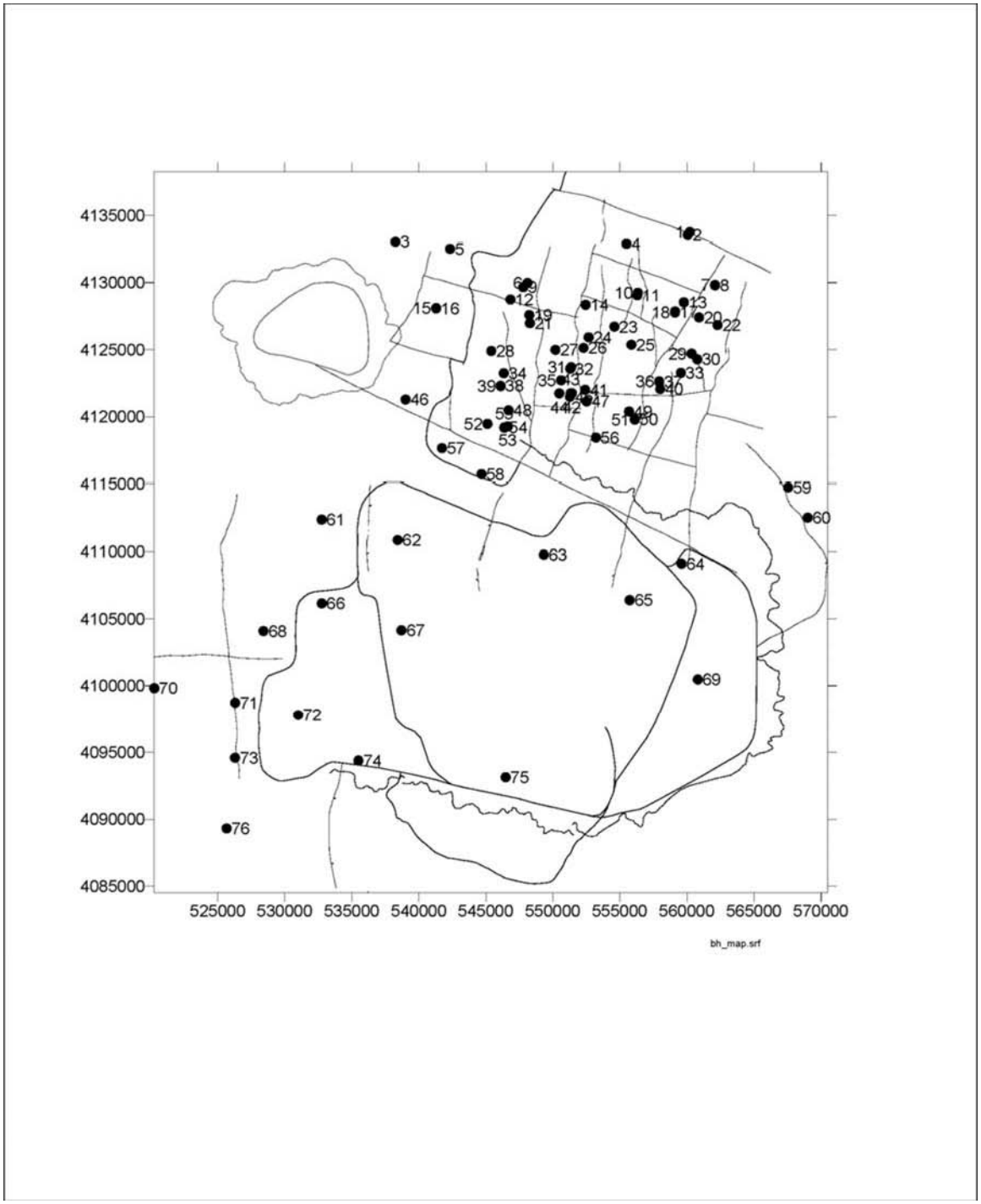
Source: Department of Energy, 2007.

Figure 6: Map Showing Location of the Pahute Mesa Model Area



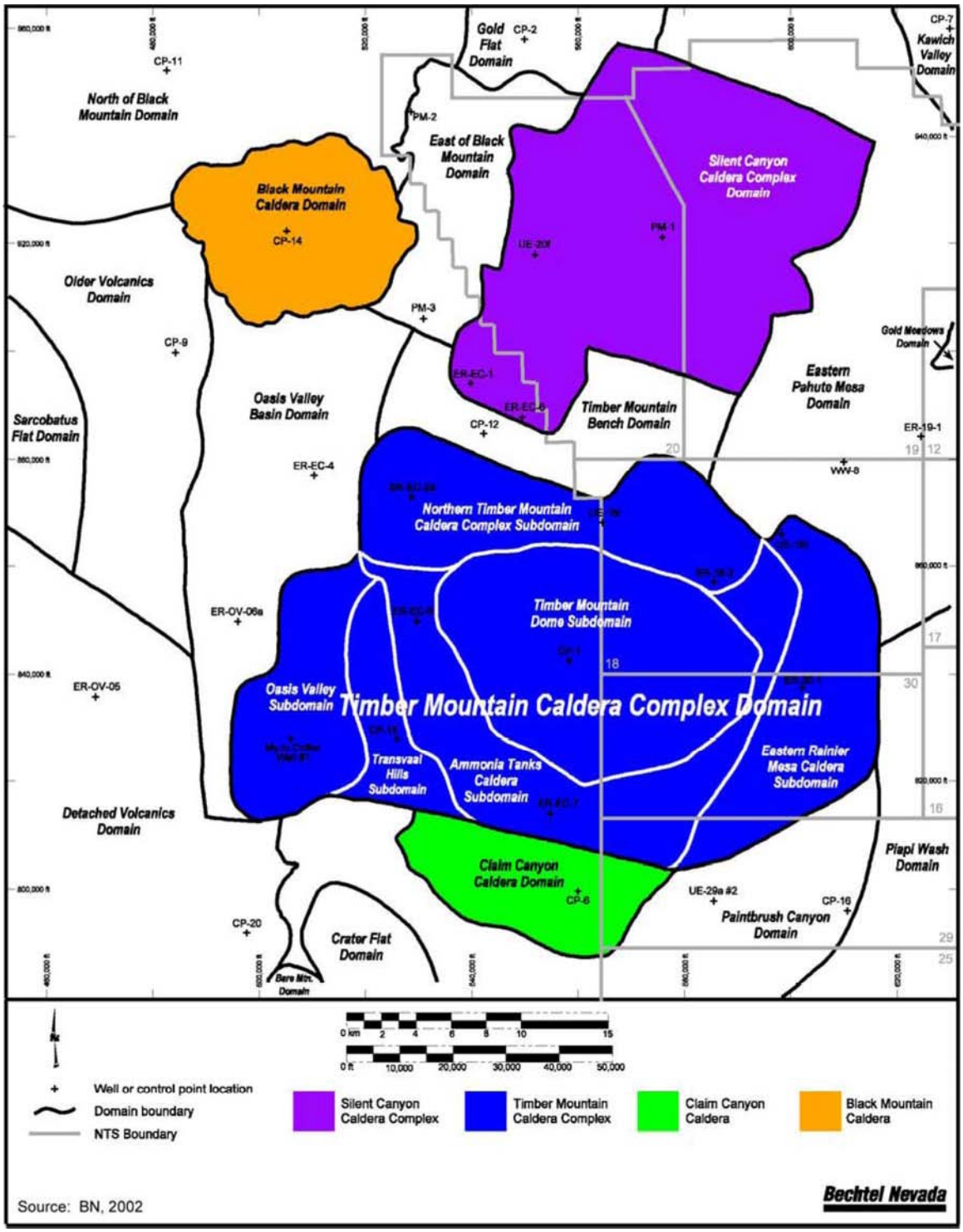
Source: Stoller-Navarro (2006) Groundwater Flow Model of CAUs 101 and 102: Central and Western Pahute Mesa, Nye County, Nevada, Figure 1-1 Location of the Pahute Mesa Corrective Action Units, p. 1-5.

Figure 7: Location of Boreholes used in Stoller-Navarro (2006)



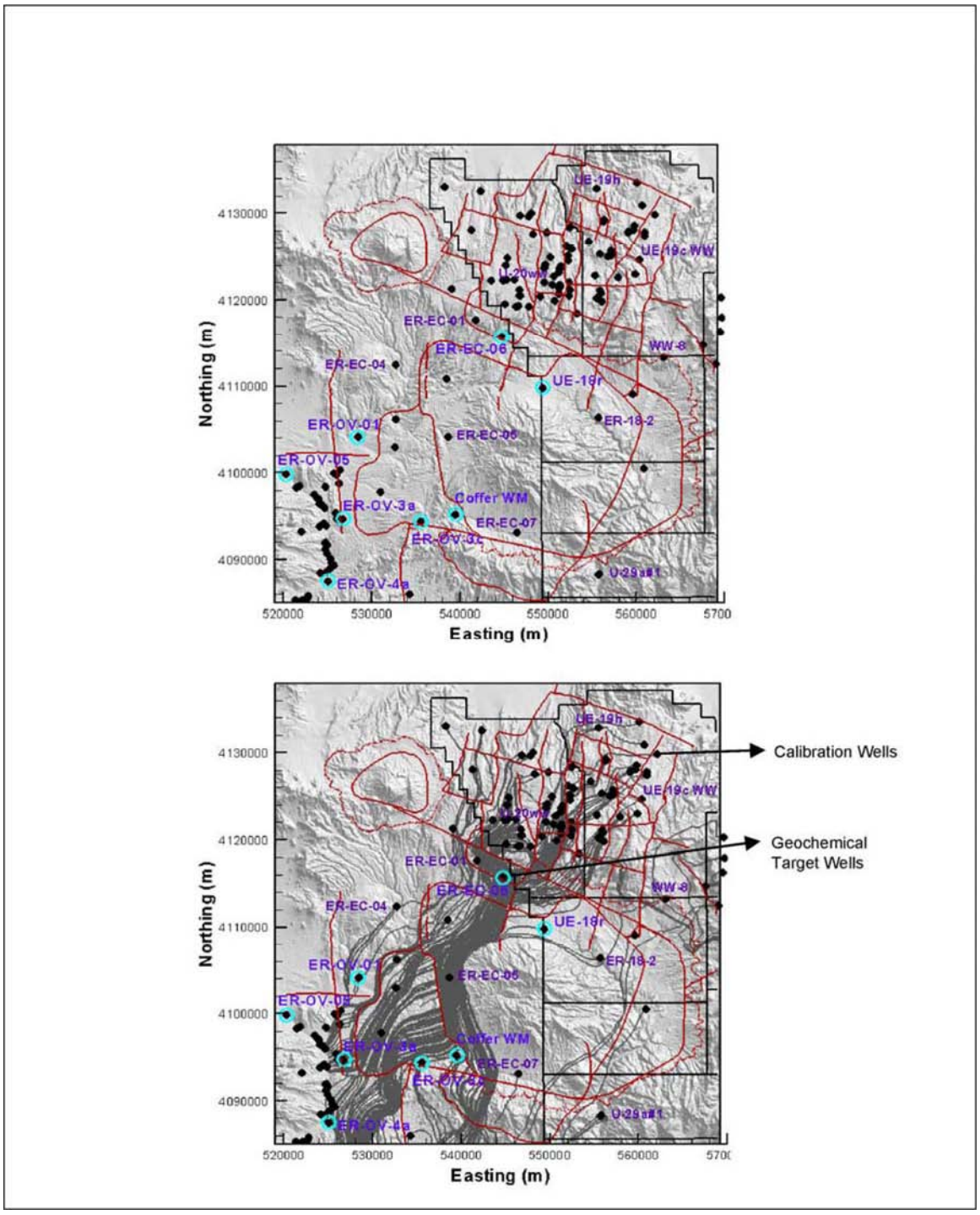
Source: Stoller-Navarro (2006) Groundwater Flow Model of CAUs 101 and 102: Central and Western Pahute Mesa, Nye County, Nevada, Figure C.4-1 Location of Boreholes Used in Study, Appendix C, p. C-10.

Figure 8: Map Showing Hydrogeologic Domains in the Pahute Mesa and Oasis Valley Model Area



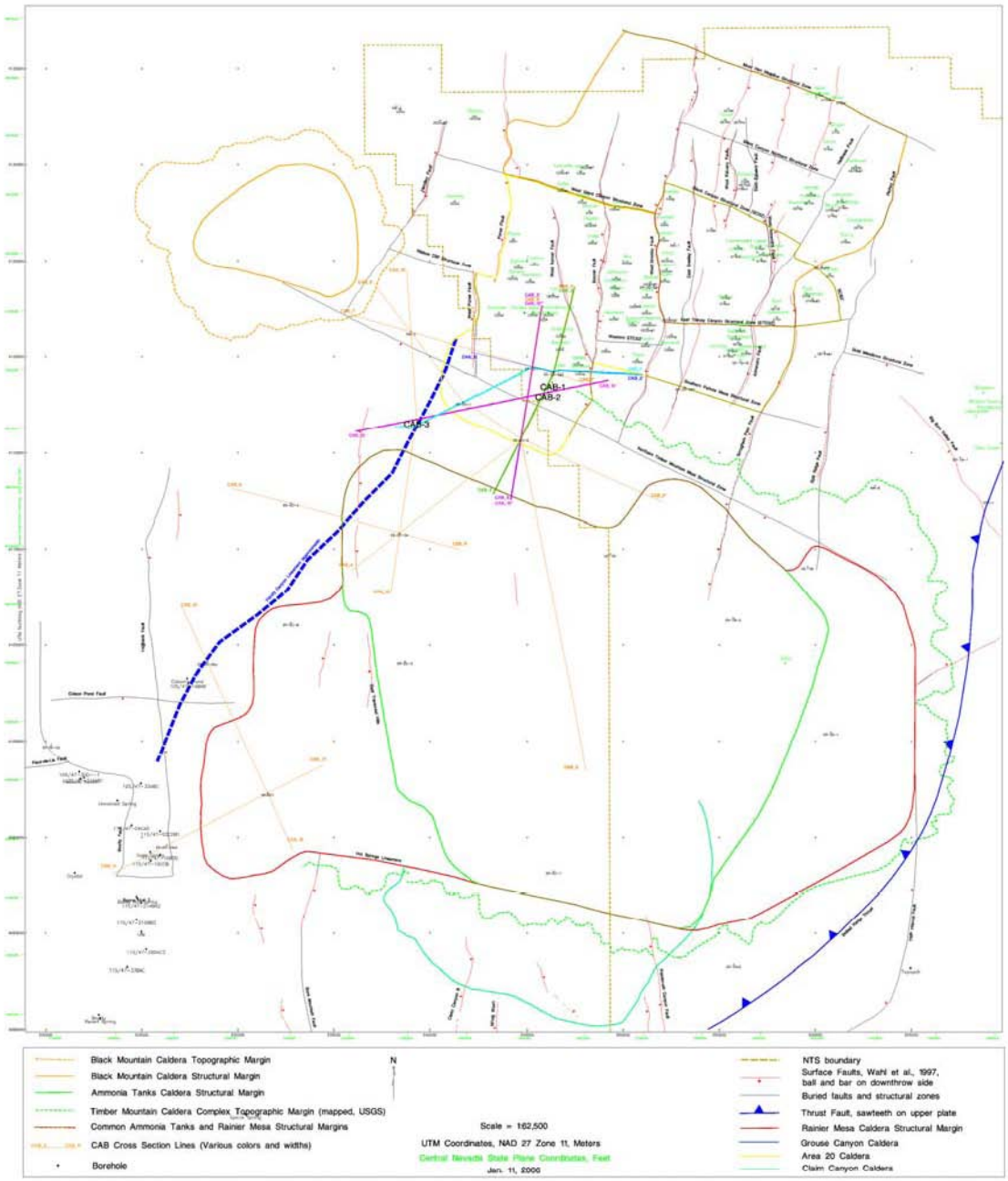
Source: Stoller-Navarro (2006) Groundwater Flow Model of CAUs 101 and 102: Central and Western Pahute Mesa, Nye County, Nevada, Figure 5-6 Map Showing Hydrogeologic Domains in the Pahute Mesa/Oasis Valley Model Area, p. 5-24.

Figure 9: Locations of Boreholes and Predicted Flow Paths



Source: Stoller-Navarro (2006) Groundwater Flow Model of CAUs 101 and 102: Central and Western Pahute Mesa, Nye County, Nevada, Figure 7-6, Locations of Flow Model Calibration Wells (black circles), Geochemical Target Wells (blue circles), and Pathlines for Forward SPTR Particles Originating in Open Screened Intervals of Wells in Model Domain, p. 7-9.

Figure 10: Map of the Pahute Mesa Area including NTS CAB well recommendations 1, 2, and 3



Source: Stoller-Navarro (2006) Source: U.S. DOE (2006) Source: U.S. DOE (2006)

Figure 11: Photograph of Area around NTS CAB Well Recommendations 1 and 2

Source: U.S. DOE (2006)

Figure 12: Photograph of Area around NTS CAB Well Recommendation Number 3

Source: U.S. DOE (2006)

Appendix E

Nevada Division of Environmental Protection Comments

(13 pages)

Page 1: Revision 1 comments
Pages 2-13: Revision 0 comments

NEVADA ENVIRONMENTAL RESTORATION PROJECT
DOCUMENT REVIEW SHEET

1. Document Title/Number Phase II Corrective Action Investigation Plan (CAIP) for Corrective Action Unit (CAU) 101 and 102: Central and Western Pahute Mesa, Nevada Test Site, Nye County, Nevada
2. Document Date February 2009
3. Revision Number Rev. 1
4. Originator/Organization J. Wurtz, B. Fryer/SNJV
5. Responsible NNSA/NSO ERP SubProject Mgr. Bill Wilborn
6. Date Comments Due April 3, 2009
7. Review Criteria Complete Document
8. Reviewer/Organization/Phone No. C. Andres/ 702 486-2850 ext. 232
9. Reviewer's Signature

10. Comment Number/ Location	11. Type[a]	12. Comment	13. Comment Response	14. Accept
1. Page 78, Section 5.3.3, 3rd paragraph, 1st sentence	M	Model verification includes assessments to ensure the **code**, not the model, is programmed correctly and the algorithms are implemented properly, with no assumptions or program errors.	Text was revised to reflect model verification including assessments of code not models.	Accept
General, Section 1 and 2; various sections throughout document	S	The NDEP has issued a Notice of Completion for this document's milestone; however, the NDEP strongly suggests that this document be re-written and reviewed by a technical editor in order to streamline the document and make it more understandable for every reader.	Section 1 and 2 have been re-written to give a synopsis of the work performed during the Phase I CAI, a synopsis of the changes being made to Section 3.0 of Appendix VI of the FFACO as they pertain to CAU 101/102, followed by a description of the work planned for the Phase II CAIP. Minor changes were made throughout the document to mirror the new sections 1 and 2. Section numbering changed, so references were changed throughout the document.	Accept

[a]Comment Types: M = Mandatory, S = Suggested.
Return Document Review Sheets to NNSA/NSO Environmental Restoration Division, Attn: QAC, M/S 50

NEVADA ENVIRONMENTAL RESTORATION PROJECT
DOCUMENT REVIEW SHEET

1. Document Title/Number: Phase II Corrective Action Investigation Plan for Corrective Action Units 101 and 102: Central and Western Pahute Mesa, Nevada Test Site, Nye County, Nevada.	2. Document Date: November 2008
3. Revision Number: Rev. 0	4. Originator/Organization: J. Wurtz, B. Fryer/SNJV
5. Responsible DOE/NV ERP Subproject Mgr.: Bill Wilborn	6. Date Comments Due: : January 6, 2009
7. Review Criteria: Complete Document	
8. Reviewer/Organization Phone No.: C. Andres/702 486-2850 ext. 232	9. Reviewer's Signature:

10. Comment Number/Location	11. Type[a]	12. Comment	13. Comment Response	14. Accept
		Technical Comments:		
1. P. 54, Section 5.2.5, first paragraph, third and fourth sentences:	M	In the third sentence, exceedance volume (EV) is being used as a volume. In the fourth sentence, the EV is defined to be "the area extent of model grid nodes…." Please clarify this section because a volume and an area extent are not the same.	The text has been revised to clarify that the surface projection (map view) of the exceedance volume can be used to represent the contaminant boundary.	Accept
2. P. 56, Section 5.2.5.1.1, first paragraph, last sentence:	M	The use of "EV" is incorrect when referring to Figures 5-2 through 5-4. The areal extent of the flow paths shown is these figures. Please clarify the use of "EV" in the document.	The text has been revised to clarify that the surface projection (map view) of the exceedance volume is represented in the figures.	Accept
3. P. 62, Section 5.2.5.2, **Depth Decay**, third sentence:	M	It is stated that "Although depth decay is not well characterized, it has proven to be necessary to calibrate to head and discharge targets (SNJV, 2006 and 2007)." Will all the uncertainties associated with this application be considered in the Phase II modeling?	Uncertainty with regard to depth-decay was evaluated during model calibration for Phase I modeling, and will be evaluated during Phase II modeling. A subsection in Sec. 5.3 has been added stating that uncertainty with regard to depth-decay will be evaluated during Phase II modeling.	Accept

[a]Comment Types: M = Mandatory, S = Suggested.

10. Comment Number/Location	11. Type[a]	12. Comment	13. Comment Response	14. Accept
4. P. 63, Section 5.2.5.2, **Depth Decay**, last sentence:	M	It is stated that the issue of depth decay and anisotropy being highly correlated in the flow model calibration analysis but possibly having substantially different impacts on contaminant migration and simulated concentrations "was not rigorously investigated in Phase I. " Will this be investigated in Phase II? If so, how? If it is not, what will be the impact?	A subsection in Sec. 5.3 has been added stating that uncertainty with regard to depth-decay and anisotropy will be evaluated during Phase II modeling.	Accept
5. P. 63, Section 5.2.5.2, **Transport Calibration**, last sentence:	M	Will the uncertainty(ies) associated with the transport predictions and the source term used for transport modeling be considered during Phase II?	Uncertainty associated with the transport predictions and the source term used for transport modeling will be evaluated during Phase II modeling. Consideration of uncertainties is a basic part of the modeling process. This subsection specifically addresses uncertainty as a result of the lack of data for calibration. The characterization program addresses this lack of data. No change in text.	Accept, see comment response
6. P. 64, Section 5.2.5.2, **Boundary Flow**, first paragraph, second sentence:	M	The UGTA regional flow model (DOE/NV, 1997) is indicated as one of the models used to obtain estimates of boundary conditions. For the other CAU models, the Death Valley Regional Groundwater Flow Model is being used for boundary conditions and being modified for each CAU. Will the Phase II modeling for Pahute Mesa and transition to the Death Valley Regional Groundwater Flow Model to remain consistent with the other CAU models?	This activity was added into Sec. 5.3.2.2 [revised numbering] as a Ph II model activity related to boundary conditions.	Accept
7. P. 69, Section 5.2.9.2, **Flow Model Parameter Evaluation**, last sentence:	M	Will the "general concern that the flow field is not adequately represented in the current Pahute Mesa model" be addressed through the work of the Phase II?	Concerns about the flow field will be addressed in Phase II modeling. A number of specific activities are listed in Sec. 5.3 specifically addressing concerns about the flow field. No change in text.	Accept, see comment response
8. P. 70, Section 5.2.9.5, first sentence:	M	Will the "Transport at a fracture network scale, considering the effects of heterogeneity, anisotropy, and scale" be better understood through the work of the Phase II?	Transport at the fracture network scale, considering the effects of heterogeneity, anisotropy, and scale, will be better understood through Phase II work. Activities are specifically listed in Sec. 5.3 addressing fracture flow and transport. No change in text.	Accept, see comment response

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10. Comment Number/Location	11. Type[a]	12. Comment	13. Comment Response	14. Accept
9. P. 78, Section 5.2.16.5, second paragraph, last sentence:	M	"…assigned based on geostatistical metrics (correlation length and juxtapositional relationship)." Are data available on these geostatistical metrics or will they have to be obtained?	Existing data and new data from Phase II data acquisition will be analyzed to develop geostatistical metrics. The characterization work in Sec. 6 addresses new data acquisition. No change in text.	Accept, see comment response
10. P. 79, Section 5.2.16.5, first sentence on page:	M	"…models that **may (**bold added) be used include:" Will one of the three approaches listed be used to conduct this work or will an alternate, appropriate approach be used, as the word "may" implies a choice will be made?	The three approaches listed are potential approaches presently identified. The use of 'may' indicates latitude to use a different approach if it is determined more appropriate. No change in text.	Accept, see comment response
11. P. 80, Section 5.2.16.7, second paragraph, first sentence:	M	Please add a reference that explains this alternative approach or add the explanation to the text.	A reference to Sec. 5.4 of the Pahute Mesa Phase I transport model document will be added.	Accept
12. P. 101, Section 6.1.2.3:	M	As has been discussed with the NDEP previously, the NDEP should be consulted before any multiple well or large scale aquifer testing is conducted due to the possibility that an MWAT could increase the rate of contaminant transport and/or the amount of contaminant transported beyond the NTS boundary, thus increasing the danger to the public and environment (perceived or actual).	Planning for such testing will be discussed with NDEP. The Fluid Management Plan requires agreement with NDEP before running such a test. No change in text.	Accept, see comment response
13. P. 102, Section 6.1.2.3.1, first sentence:	M	When will the decision be made to use or not use multiple well aquifer tests to evaluate the listed objectives?	Planning for such testing will be discussed with NDEP prior to implementation. The Fluid Management Plan requires agreement with NDEP before running such a test. No change in text.	Accept, see comment response

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10. Comment Number/Location	11. Type[a]	12. Comment	13. Comment Response	14. Accept
14. P. 106, Section 6.1.2.8, first paragraph, first sentence:	M	A reference is needed for the temperature profiling with distributed temperature sensors (DTS) method.	The text will be revised to clarify the focus on temperature profiling. Distributed temperature sensors (DST) are a standard technology that can be used for temperature profiling. No particular reference is required. The objective stated is to obtain temperature profile data, and the DST technology mentioned is particularly applicable to situations where the profile is changing rapidly.	Accept
		Editorial Comments:		
15. P. 37, Section 3.4.1.1.1	M	- RM/SM – typo?	The specified typo was not found in Section 3.4.1.1.1.	Reject, see comment response
16. P.38, Section 3.4.1.2, second sentence:	M	Either remove “was” between “...investigation area” and “incorporated in the... ” or insert “and” between “...transport models” and “is presented... ”	Revised the text.	Accept
17. P. 54, Section 5.2.5	M	Are the last two sentences true?	The text was clarified.	Accept
18. P. 61, Section 5.2.5.2, **Faults**:	M	The second “sentence” of this paragraph is not grammatically correct and should be reworded. **Faults –** the second sentence does not make sense / is not grammatically correct.	The text was revised.	Accept
19. P. 63 -	M	Will the issue of depth decay be investigated further since it “was not rigorously investigated in Phase I?”	Text has been added in Sec. 5.3.	Accept
20. P. 65, Section 5.2.5.2, **Boundary Flow**, last sentence	M	“verifying” vs “verify.” “...verifying...” should be changed to “…verify...”	Changed the text.	Accept

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21. P. 69, Section 5.2.9.2 -	M	??? the last sentence.	This sentence reports the conclusion of the TWG Pahute Mesa Modeling Preemptive Review Committee. This is addressed in Sec. 5.3 concerning Phase II modeling activities.	Accept
22. P. 74, Section 5.2.12	M	Is the last really necessary? Please remove the last sentence of this paragraph.	Deleted the text.	Accept
23. P. 77, Section 5.2.16.4 – last two sentences	M	Will this situation be corrected?	The text states that the situation will be corrected as necessary. No change to text.	Accept, see comment response
24. P. 83, Section 5.2.17 – third last sentence	M	How will this be done?	Verification will be accomplished according to requirements in the FFACO, as discussed in Sec. 1.5.2.4. This references were added to the text in Sec. 5.3.3 (revised numbering).	Accept
25. P. 88, Figure 6-1	M	Kind of hard to read.	The figure conveys much information, and has been made as clear as possible. Please refer to Plate 1 for additional detail.	Accept, see comment response
		"FFACO-related" and Consistency Comments: The following comments have been generated while reviewing the document (1) in light of the NNSA/NSO and the NDEP's verbally agreed-to changes to the FFACO and (2) for consistency throughout the document. The FFACO changes are currently being documented in writing through a modification to Appendix VI of the FFACO. The needed changes include, but are not necessarily limited to,:		

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10. Comment Number/Location	11. Type[a]	12. Comment	13. Comment Response	14. Accept
26. P. 1, Section 1.0, second paragraph:	M	A summary of the Phase I CAI, as well as, the change in overall strategy from the Phase I Pahute Mesa CAIP to the Phase II Pahute Mesa CAIP should be stated in the beginning of the document, along with the fact that this change in strategy is/will be reflected in changes made to the FFACO. For the remainder of the document, only the new strategy which will be used for the Phase II CAI and that will be reflected in the revised FFACO should be described. It is very confusing to the reader to have the continual flip back and forth between the Phase I and Phase II CAIs and the "old" and "new" FFACO strategies, such as the second sentence of this second paragraph.	The Phase I CAI history will be discussed in Section 1.0 and deleted from the remainder of the document.	Accept
27. P. 3, Section 1.1, first paragraph:	M	As stated above, an explanation of or a reference to the Phase I CAIP should be made in the beginning of the document and any references to it in afterward should be removed. Additionally, Section 1.1 of the Pahute Mesa CAIP (DOE/NV, 1999) does not state the last half of the first sentence of this paragraph to be the purpose for the Phase I CAI.	See response to comment 26. The sentence will be revised to be consistent with the PM Ph I CAIP and the FFACO version in effect at the time the CAIP was issued, and as effective during the course of the Ph I CAI.	Accept
28. P. 4, Section 1.1, first paragraph:	M	The contaminant boundary definition and revision to the FFACO have already been agreed to by the NNSA/NSO and NDEP; therefore, the “proposed” wording in the last sentence of this paragraph should be removed and the sentence written according to the present agreement.	The proposed language for the revision of the FFACO will be referenced as adopted by NNSA/NSO per verbal communication with NDEP on December 10, 2008 and December 31, 2008.	Accept
29. P.4, Section 1.1, second paragraph:	M	This paragraph states the primary purpose of the Phase II; however, in other Sections of the document, listing of additional types of work or goals to be completed during the Phase II or purposes for the Phase II are presented (see comments below). All such listings should be consistent if they are going to be repeated throughout the document.	The additional types of work or goals discussed in other sections of the document support the primary purpose. The text has been revised to generalize statements encompassing all work discussed in this document.	Accept

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10. Comment Number/Location	11. Type[a]	12. Comment	13. Comment Response	14. Accept
30. P. 4, Section 1.2:	M	Remove the first sentence as it refers to the Phase I CAIP. Additionally, the last sentence of this Section, the last sentence of Section 1.1, the second sentence of Section 1.3 and the introductory paragraph of Section 6.0 should all be consistent.	The Phase I CAI history will be discussed in Section 1.0 and deleted from the remainder of the document.	Accept
31. P. 6, Section 1.3.2, fifth sentence:	M	Not only does this sentence refer to the Phase I, it does not make sense.	This section documents compliance with the PM Ph I CAIP and FFACO requirements, as they have changed, and agreements with NDEP. The sentence has been clarified.	Accept
32. P. 7, Section 1.4, second sentence:	M	This sentence sounds as if it is the objective, or at least one of them, for the Phase II CAIP, not the Phase I, especially in light of the first sentence in the second paragraph of this Section.	This sentence describes a common objective of the Phase I and Phase II CAIs.	Accept
33. P. 11, Section 1.5.1, second sentence:	M	Is the definition of the contaminant boundary referred to here the same one given in Section 1.l? Also, model "validation" has been changed to model "evaluation" in the agreed-upon FFACO changes.	The revised definition of the contaminant boundary has been moved to Sec. 1.5.1. The change from model validation to model evaluation has been included in the text.	Accept
34. P. 14, Section 1.5.2.4, first paragraph, first and fifth sentences:	M	It is not clear which version of the FFACO is being written about.	The version of the FFACO language referenced has been clarified as the revised version.	Accept
35. P. 14, Section 1.5.2.4, bullet No. 1 below first paragraph:	M	The definition of model verification as "redefined" does not match the definition presented in the new suggested FFACO language presented on December 10, 2008.	The text has been revised.	Accept

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10. Comment Number/Location	11. Type[a]	12. Comment	13. Comment Response	14. Accept
36. P. 18, Section 2.0:	M	As was discussed on December 31, 2008 between the NNSA/NSO and the NDEP, the Phase I Pahute Mesa CAI should be summarized in the beginning of the document and the remainder of the document should detail the work for the Phase II CAI in light of the verbally-agreed upon changes that will be captured in a written modification to Section 3.0 of Appendix VI of the FFACO. Because all the written changes to the FFACO have not been made as of this date, it may be beneficial to omit specific FFACO references from this document.	The Phase I CAI history will be discussed in Section 1.0 and deleted from the remainder of the document.	Accept
37. PP. 18 and 23, Sections 2.0 and 2.1.2:	M	In regards to the UGTA Project Strategy and Corrective Action Strategy, there have been previous discussions between the NNSA/NSO and the NDEP as to what a "strategy" is and how sections such as 2.1.2 of this document and Section 3.2 of the FFACO should be worded. These two sections do not coincide with what is currently written in Section 3.2 of the FFACO.	The text has been revised to conform to Section 3.2 of the FFACO (1996, as amended February 2008).	Accept
38. P. 23, Section 2.1.2.1:	M	The manner in which this sentence is worded is confusing as it appears that both the "old" and "revised" FFACO are being referred to.	The incorrect reference to the FFACO (as amended February 2008) was removed.	Accept
39. P. 24, Section 2.1.2.2:	M	It is the understanding of the NDEP that the Phase II CAIP and the revised Section 3.0 of Appendix VI will be consistent. Therefore, this paragraph should be written as such.	The proposed language for the revision of the FFACO will be referenced as adopted by NNSA/NSO per verbal communication with NDEP on December 10, 2008 and December 31, 2008.	Accept
40. P. 25, Section 2.1.2.4:	M	It is not clear why Figure 3-2 of Appendix VI is referenced in this paragraph when it is stated that the revised CAI process is shown in Figure 2-2 of the document.	The text has been revised to only reference Figure 2-2. The reference in question indicated the corresponding figure in the FFACO.	Accept
41. P. 25, Section 2.1.2.5:	M	This section appears to refer to the "old" strategy. It should either be eliminated or updated.	The text has been revised to clarify the change from the 'old' strategy to the 'new' strategy.	Accept

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42. PP. 25 and 28, Section 2.1.3:	M	This Section provides an excellent synopsis as to how the Agencies have arrived at this point in time in regards to the Pahute Mesa CAU. However, since the Agencies do not yet have the agreed-upon changes in writing, the beginning of the last sentence on Page 25 should be changed from "This modification…" to "The modification…" Also, based on the recent FFACO discussions, the end of the paragraph should be "...leading to the CADD/CAP."	This subsection referred to the Phase I CAIP, and has been deleted from this section. The proposed language for the revision of the FFACO will be referenced as adopted by NNSA/NSO per verbal communication with NDEP on December 10, 2008 and December 31, 2008.	Accept
43. P. 28, Section 2.1.4:	M	Based on the recent FFACO discussions, it is the understanding of the NDEP that a combined CADD/CAP will be prepared and submitted for review and approval.	This will be included in the text. The proposed language for the revision of the FFACO will be referenced as adopted by NNSA/NSO per verbal communication with NDEP on December 10, 2008 and December 31, 2008.	Accept
44. P. 28, Section 2.2:	M	It is possible that this Section should be in the beginning of the document as it gives a background statement. Also, "Appendix VI of" should be inserted between "...to Section 3.2 of... " and "...the FFACO that... "	The statement will be revised to indicate Section 3.2 of Appendix VI of the FFACO. The relevant content is also included in Section 1.0 of the document.	Accept
45. P. 29, Section 2.2.1:	M	The "proposed" revised UGTA Corrective Action Strategy is shown in Figure 2-4. Also, the use of the word "strategy" in the last sentence is questioned for consistency of use when compared to Section 2.1.2 of the document.	The text has been revised to specify 'proposed' revised strategy. The referenced statement now refers to the decision process to implement the strategy.	Accept
46. P. 29, Section 2.2.2, second paragraph:	M	What is a "perimeter boundary" vs. a "contaminant boundary?"	The text has been revised to clarify.	Accept
47. P. 31, Section 2.2.6:	M	The title of this section should be "Model Evaluation" and "model validation" in the first sentence should be "model evaluation" as per the verbal agreement to date with the NDEP. It also appears that the explanations for each of the three steps of the revised process are explained in reverse order in the paragraph.	The text has been revised to discuss model evaluation as a primary process under the heading "Model Acceptance".	Accept

[a]Comment Types: M = Mandatory, S = Suggested.

10. Comment Number/Location	11. Type[a]	12. Comment	13. Comment Response	14. Accept
48. P. 37, section 3.4.1.1.1:	M	It is not clear what is meant by "updated" in the first sentence since it is referring to the 1999 Pahute Mesa CAIP, one of the first documents for this CAU. Also, the second sentence states that the hydrostratigraphy of the investigation area incorporated in the Phase I flow and transport models is presented in two HDDs, yet the last sentence states the Flow Model and the Transport Model present the hydrostratigraphy incorporated in the flow and transport models. Do all four of these documents present the same hydrostratigraphy presented in the flow and transport models?	"updated" has been removed. All four documents present hydrostratigraphic information, which was continually updated during the course of the CAI.	Accept
49. P. 38, Section 3.4.1.2:	M	Except for the first sentence being removed and a few word changes in the next sentence, this section is identical to Section 3.4.1.1.1.	The same reports discuss both the regional hydrogeology and hydrostratigraphy and the Pahute Mesa hydrogeology and hydrostratigraphy. The text has been generalized.	Accept
50. P. 38 through 41:	M	The use of the words "current," "additional," "supplemented," and "updated" all add to the understanding of this document as it is currently written.	These terms describe the differing nature of new information and interpretations offered in successive documents. No change to text.	Accept, see comment response
51. P. 42, Section 4.2, second sentence:	M	It is not clear what is meant by this sentence because the NDEP is not aware of revisions to the current DQOs due to any of the revisions mentioned in this sentence. If the DQOs have been revised to address the February 2008 FFACO revisions, will the DQOs be revised with the upcoming FFACO revisions?	The DQO guidance changed, and the statements of the DQOs have been revised to conform to the new DQO process structure. The revised statements reflect the proposed revision of the FFACO.	Accept
52. P. 44, Section 5.0, first sentence:	M	This sentence appears to refer to the Phase I CAI but this is not stated and therefore confuses the reader. Sentences ten and eleven of the first paragraph are a good synopsis of previous and future work though the word "may" in the eleventh sentence is a little confusing because changes to the FFACO have been already agreed to by the NNSA/NSO and the NDEP.	The first sentence presents a general statement about the CAI non-specific to Phase I or Phase II. The text concerning the adopted language for the proposed changes to the FFACO have been removed.	Accept

[a]Comment Types: M = Mandatory, S = Suggested.

10. Comment Number/Location	11. Type[a]	12. Comment	13. Comment Response	14. Accept
53. P. 51, Section 5.2.4.1, first paragraph, last sentence:	M	It is not clear why this conclusion statement is included in this document.	The statement is out of place and will be removed from the subsection.	Accept
54. P. 65, Section 5.2.6:	M	This section appears to refer to the current, written FFACO, not the agreed-upon revisions under which the Phase II CAI will be conducted. It should either be eliminated or updated.	The text has been changed to proposed language for the revision of the FFACO referenced as adopted by NNSA/NSO per verbal communication with NDEP on December 10, 2008 and December 31, 2008.	Accept
55. P. 65, Section 5.2.7, first paragraph, first sentence:	M	"…capable of producing a consistent approach," The new FFACO language presented on December 10, 2008 indicated an "acceptable model" not consistent. Please make this text consistent with the new suggested FFACO language.	The text has been revised to be consistent with new suggested FFACO language.	Accept
56. P. 65, Section 5.2.7:	M	This section is not in conformance with the revised definitions presented to the NDEP on December 10, 2008.	The text has been revised to be consistent with new suggested FFACO language.	Accept
57. P. 75, Section 5.2.14:	M	It is not clear what "section" and "work" is being referred to in the second and third sentences. Also, Section 2.2 of the FFACO concerns Industrial Sites.	The text has been revised to clarify the references in these sentences. The section reference has been corrected.	Accept
58. P. 82, Section 5.2.17:	M	The title of this section and Section 2.2.6 need to be the same. Also, "a model evaluation process" is never discussed in Section 2.2.6. The remainder of the paragraph accurately reflects the current verbal agreement the NNSA/NSO and the NDEP have in regards to updating the FFACO language.	The titles have been revised under the upper level "Model Acceptance" heading. The text has been changed to conform to the proposed revisions.	Accept
59. P. 83, Section 5.2.18:	M	The boundary criteria stated in this paragraph is different that that stated in Section 2.2.2.	The text has been revised to conform.	Accept

[a]Comment Types: M = Mandatory, S = Suggested.

10. Comment Number/Location	11. Type[a]	12. Comment	13. Comment Response	14. Accept
60. P. 84, Section 6.0:	M	Stated objectives should be consistent throughout the document.	The objectives stated here are specific, lower level objectives for the characterization program, and are consistent with objectives for the CAI stated elsewhere.	Accept
61. P. 85, Section 6.1.1.2:	M	The latter half of the first paragraph is a very good summary of the Phase I and Phase II drilling programs, and if it applies, could be used in the revised Section 3.0 of Appendix VI of the FFACO for all the NTS CAUs.	Accept	Accept
62. P. 124, Section 7.2:	M	The subsections of Section 5.2 of the UGTA Project QAPP appear to use the terms “verification” and “validation” interchangeably. As has been discussed in several meetings between the NNSA/NSO and the NDEP, these two words have very distinct meanings and should not be used interchangeably. Also, as per the changes to the FFACO already agreed to by the two Agencies, “model evaluation” will replace validation. As such, pertinent sections of the QAPP will also have to be changed to reflect the changes made to the FFACO as reflected in this document in order that all documents are consistent.	This subsection of the document and the cited section of the UGTA QAPP specifically deal with software verification and validation as opposed to model verification and validation. The UGTA QAPP will be revised in the near future.	Accept

[a]Comment Types: M = Mandatory, S = Suggested.

Plates

520000 530000 540000 550000 560000

4130000 4120000 4110000 4100000 4090000

Nevada Test & Training Range

Nevada Test & Training Range

Pahute Mesa

Silent Canyon

Grass Spring Canyon

Basket Valley

Dead Horse Flat

Lambs Canyon

Gritty Gulch

Kawich Canyon

Big Burn Valley

Rainier Mesa

Stockade Wash

Buckboard Mesa

Rocky

Blackboard Mesa

Brushy Canyon

Timber Mountain

Oasis Valley

BLM and Private Lands

Fortymile Canyon

Shoshone Mountain

Yucca Mountain

Pah Canyon

ER-20-10 (10)

ER-20-7 (1)

ER-EC-11 (2)

ER-20-8 (3)

ER-20-4 (11)

ER-EC-15 (7)

ER-20-9 (8)

ER-EC-12 (4)

ER-EC-13 (5)

ER-EC-14 (6)

ER-EC-16 (9)

ER-EC-3 (12)

Explanation

- \+ Existing Well
- Proposed Wells
- Faults (Slate et al., 1999)
- U.S. Highway
- Roads
- Major elevation contours - contour interval 500 ft
- Minor elevation contours - contour interval 100 ft
- Nevada Test & Training Range Boundary
- NTS Boundary

Well Name + Total Depth (ft) / Penetration Below Static Water Level / HSU at Total Depth

STOLLER-NAVARRO

μ

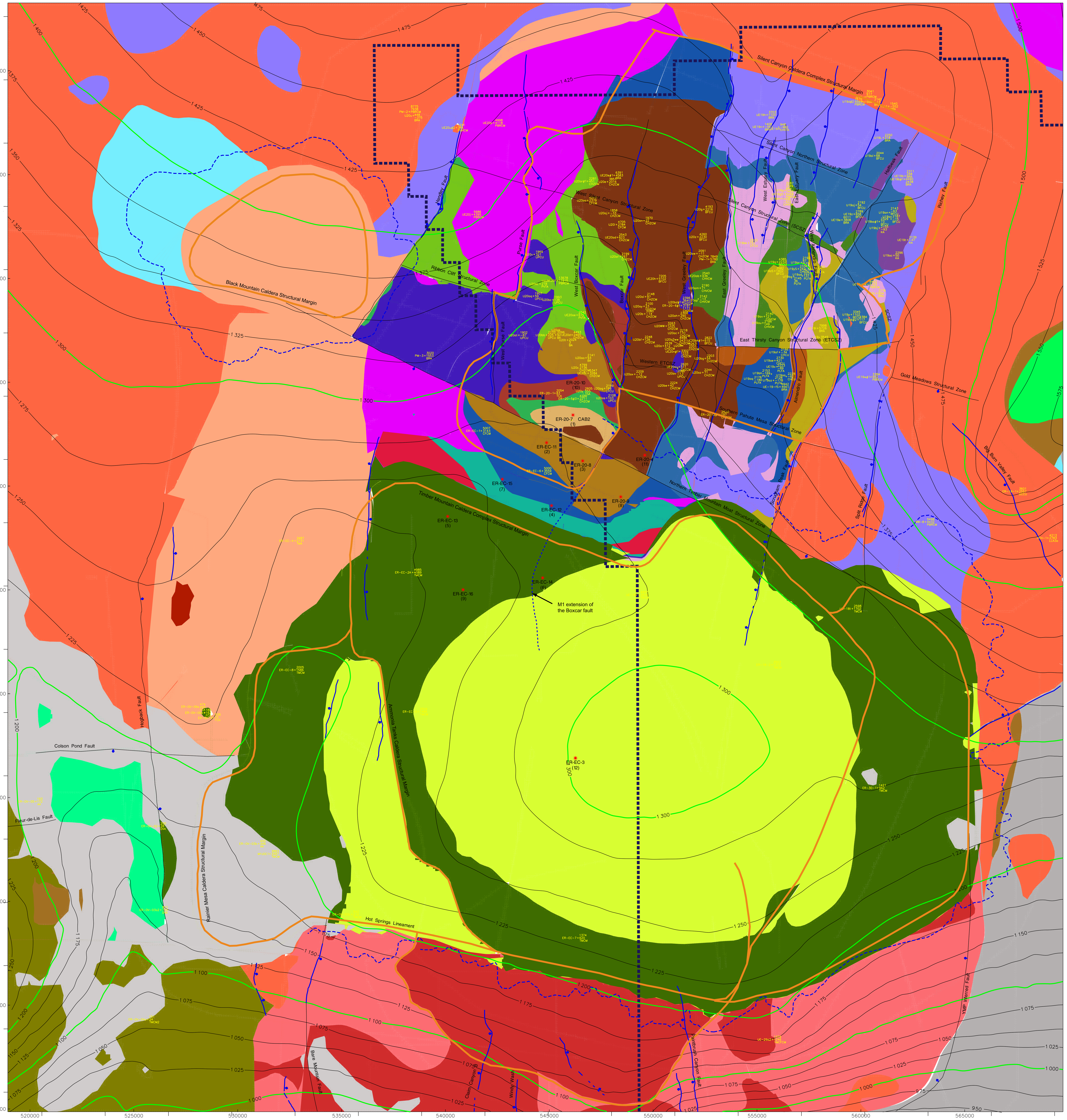
Plate 1
Pahute Mesa
Well Location Map
Showing Proposed Phase II
Well Locations and Priority

Source: SNJV GIS, 2008

0 1 2 4 Miles

H:\digital\SlatePM\cont_100_faults_wells_61000_E_L_v2.mxd 11/19/2008

UNCONTROLLED When Printed



LEGEND

- Caldera Structural Margin (projected to surface)
- Caldera Topographic Rim
- Surface Faults
  ball and bar on downthrown side
- Buried Faults (dashed where inferred)
- NTS Boundary
- Water Table major contours, elevation (m)
- Water Table minor contours, elevation (m)
- Well Location with Well Name (U-19av; 2140; 121; BFCU)
  - Depth from land surface to total depth (ft)
  - Depth from water table to total depth (ft)
  - HSU at total depth
- Proposed Pahute Mesa Phase II CAIP Well Locations (Priority) (ER_EC_11 (1))

AA	TCA	PBRCM
DVA	PLFA	TMCM
DVCM	LPCU	SCVCU
YVCM	TSA	LCA3
TCVA	YMCFCM	LCCU1
FCCM	CHVTA	UCCU
FCA	CHVCM	LCA
THLFA	CHZCM	LCCU
THCM	CHCU	SCICU
TMA	IA	MGCU
WWA	CFCM	BMICU
PCM	CFCU	CHICU
PVTA	KA	CCICU
FCCU	BFCU	RMICU
BA	BRA	ATICU
UPCU		

N

UTM Easting NAD 27 Zone 11 in meters

Nevada State Plane Zone Central 2702 in feet

Elevation Contour Interval 25 meters

Plate 2

Map Showing Structural Features Drill Holes and HSUs at the Water Table within the Pahute Mesa - Oasis Valley Model Area

Source: SNJV EarthVision, 2008

March 22, 2008

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