

STATE OF NEW MEXICO
ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT
OIL CONSERVATION DIVISION

IN THE MATTER OF MESQUITE SWD, INC.'S APPLICATION NO. PKVR0817936301
TO AMEND PERMIT SWD-180

Case No. 14178

APPLICANT MESQUITE SWD, INC.'S CLOSING STATEMENT

Mesquite SWD, Inc. ("Mesquite") submits the following closing statement in support of its Application to Amend Permit SWD-180 (the "Application"). Mesquite's application to dispose of produced water in the Exxon State No. 8 at a depth of 694 feet should be granted because: (1) the TDS concentrations in the area of review exceed the maximum levels for protected water; and (2) the Exxon State No. 8 is not hydrologically connected to any protected water, due to its location in the back reef facies of the Capitan Reef complex and the structural and groundwater gradients within the Capitan Reef complex.

I. The Water in the Area of Review Is Not Protected Because Its TDS Concentrations Exceed 10,000 mg/l.

The Exxon State No. 8 disposes of produced water in a zone where TDS levels exceed the maximum TDS concentration for protected water. **19.15.9.701(E)(2) NMAC** ("The division shall not permit disposal into zones containing waters having total dissolved solid concentrations of 10,000 mg/l or less..."); **Ex. 25, Assessment of the Geological Structure and Stratigraphy and Hydrogeological Setting of the Mesquite Exxon State No. 8 Saltwater Disposal Well and Other Wells** ("Assessment Report"), p. 19-20; **Ex. 33, Response to Request for Additional Information Concerning the Area of Review**, ("Response to NMOCD"), p. 8. The New Mexico Oil Conservation Division ("NMOCD") regulations do not limit salt water disposal in zones that contain water with a TDS concentration of *more* than 10,000 mg/l.

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19.15.9.701(E)(2) NMAC.

The wells immediately surrounding the Exxon State No. 8 – the Exxon State Nos. 1, 2, 3 and 7 – have TDS concentrations approximately *ten times greater* than the maximum TDS concentration of protected water. **Ex. 2, PowerPoint, p. 9; Ex. 33, Response to NMOCD, p. 8; 19.15.9.701(E)(2) NMAC.** Both the Exxon State Nos. 1 and 2 have TDS concentrations of 98,600 mg/l, almost ten times the maximum TDS concentration for protected water of 10,000 mg/l. **Ex. 33, Response to NMOCD, p. 8; 19.15.9.701(E)(2) NMAC.** The salinity levels in the Exxon State Nos. 3 and 7, located down-gradient from the Exxon State No. 8, are 114,000 mg/l, again far in excess of the maximum TDS concentration for protected water. **Ex. 33, Response to NMOCD, p. 8; 19.15.9.701(E)(2) NMAC.** The TDS concentration of water disposed of in the Exxon State No. 8 is 79,800 mg/l, significantly less than the naturally occurring salinity levels in the immediate area. **Ex. 33, Response to NMOCD, p. 8.¹**

Moreover, the TDS concentrations of water in wells in a broader area surrounding the Exxon State No. 8 support the conclusion that the Exxon State No. 8 is not hydrologically connected to any protected water. The City of Carlsbad Test Well, included in Hiss' study and located down-gradient from and 2.85 miles southeast of the Exxon State No. 8, has TDS concentrations of 23,800 mg/l at a depth of 900 feet and 22,400 mg/l at 60 feet. **Ex. 30, Discussion of Capitan Reef Aquifer Salinity, p. 7.** The Humble State No. 1 North Cedar Hills Unit, northwest of the Exxon State No. 8, has a TDS concentration of 28,000 mg/l at a depth of 1,007 – 1,170 feet. **Id., p. 7.** The Humble State No. 1 well, located immediately southeast of the Magruder field, has TDS concentrations ranging from 48,310 mg/l at a depth of 250 feet to 55,000 mg/l at a depth of 750 feet. **Id., p. 7.**

¹ Moreover, the difference in salinities between the Exxon State Nos. 1 and 2, and Exxon State Nos. 3 and 7, indicate waters in the disposal zone of the Exxon State No. 8 are not hydrologically connected.

4 others

The salinity levels of these wells confirm that no protected waters exist within the area of review and that the disposal of produced water in the Exxon State No. 8 at a depth of 694 feet will not endanger any protected waters. **Ex. 25, Assessment Report, p. 19-20; Ex. 27, Dr. Havenor Response to BLM letter re: Mesquite SWD, Inc. #8 Exxon State SWD well dated June 9, 2008 (“Response to BLM”), p. 6; Ex. 28, BLM Memorandum p. 1-2; Ex. 30, Discussion of Capitan Reef Aquifer Salinity, p. 8.** Although Mr. Jones of the NMOCD testified that his personal preference would be to limit the disposal of water to the same formation from which the water was withdrawn, the NMOCD regulations do not support Mr. Jones’ preference. **Hearing Tr., Testimony of Mr. Jones, p. 240, l. 7-12.** Rather, the NMOCD regulations are based solely on TDS concentrations, and Mr. Jones acknowledged that those regulations do not prohibit disposal into zones with TDS concentrations greater than 10,000 mg/l. **Hearing Tr., Testimony of Mr. Jones, p. 240, l. 7-12; 19.15.9.701(E)(2) NMAC.** Moreover, Mesquite’s sampling results demonstrate that the TDS concentrations of the produced water disposed of in the Exxon State No. 8 are actually less than the naturally occurring TDS concentrations in the wells surrounding the Exxon State No. 8. **Ex. 33, Response to NMOCD, p. 8.**

Finally, there are no water wells within a two mile radius of the Exxon State No. 8, and no protected water lies within the entire area of review. **Ex. 25, Assessment Report, p. 19-20** (“No underground drinking water sources or aquifers are present, or are known to have existed, in or beneath the [Exxon State No. 8] injection well, or within a two-mile radius of the injection well...”). **Ex. 27, Response to BLM, p. 6.** The Exxon State No. 8 operates on a vacuum and contains no natural water. **Ex. 25, Assessment Report, p. 14; Ex. 27, Response to BLM, p. 4; Ex. 33, Response to OCD Request, p. 7; Ex. 37, Review and Analysis of Magnolia #1 and**

#2, Sec. 14, T21S-R27E, Eddy County, New Mexico (“Magnolia Review and Analysis”), p.

1. Dr. Havenor’s analysis of groundwater and wells within a two-mile radius of the Exxon State No. 8 concludes that no protected water exists within two miles of the Exxon State No. 8. **Ex. 25, Assessment Report, p. 24-25.** Nor is the Exxon State No. 8 hydrologically connected to protected groundwater through faults. *Id.*, p. 20; **Ex. 28, BLM Memorandum, p 1.** Therefore, the Exxon State No. 8 has not and will not endanger any protected water by accepting produced water at a depth of 694 feet. **Ex. 25, Assessment Report, p. 24; Ex. 28, BLM Memorandum p. 1-2.**

II. The Exxon State No. 8 Is Not Hydrologically Connected to Any Protected Water within the Capitan Aquifer.

The Capitan Reef complex consists of three distinct geologic formations: the back reef facies, the reef itself, and the Capitan aquifer. **Ex. 27, Response to BLM, p. 6; Ex. 29, Reef Illustration; Ex. 30, Discussion of Capitan Reef Aquifer Salinity, p. 1-7; Ex. 31, Annotated Reef Diagram; Ex. 33, Response to NMOCD, p. 2-8** (“While the back-reef is age-wise and stratigraphically contemporaneous with the reef itself, it is not part of the organically constructed reef.”). Waters in the back reef facies are not hydrologically connected to the reef itself or to the Capitan aquifer. **Ex. 33, Response to NMOCD, p. 5.**

A. The Exxon State No. 8 Is Located in the Back Reef Facies of the Capitan Reef Complex.

TDS concentrations that exceed the maximum concentration for protected water characterize the waters in the back reef facies of the Capitan Reef complex, where the Exxon State No. 8 is located. **Ex. 25, Assessment Report, p. 18; Ex. 27, Response to BLM, p. 6; Ex. 30, Discussion of Capitan Reef Aquifer Salinity, p. 7-10; Ex. 33, Response to NMOCD, p. 5, see, 19.15.9.701(E)(2) NMAC.** In fact, no waters with TDS concentrations of less than 20,000 mg/l, *twice* the maximum level for protected water, have been found in the back reef facies. **Ex.**

30, Discussion of Capitan Reef Aquifer Salinity, p. 7-10. Consequently, there are no protected waters in the back reef facies in an area much larger than the vicinity of the Exxon State No. 8. **Ex. 25, Assessment Report, p. 20; Ex. 33, Response to BLM, p. 5-8.**

The Yates Formation, which is the injection zone for the Exxon State No. 8, is undeniably present in the back reef facies of the Capitan Reef complex, and the lithologies of that formation can be used to identify the Exxon State No. 8's position within the back reef facies. **Ex. 31, Annotated Reef Diagram, p. 2; Ex. 33, Response to NMOCD, p. 2.** As the Yates Formation nears the Capitan reef itself, the Yates Formation ceases to be recognizable as a separate geologic formation. **Ex. 33, Response to NMOCD, p. 5** ("The back-reef facies is a broad zone of lateral lithologic changes of the bed(s), from north toward the south, from gypsum, anhydrite, dolomite, sandstones, and sandy dolomites into progressively thicker beds of dolomitic limestones which eventually transition into massive limestones near the front of the reef."); *see also*, **Hearing Tr., Testimony of Mr. Jones, p. 209, l. 5-6.** Dr. Havenor's cross-section analysis demonstrates that the Yates Formation transitions from a recognizable formation into the massive limestones which are characteristic of the edge of the reef itself. **Ex. 33, Response to NMOCD, p. 2.** This transition occurs at least one mile south of the end of the cross-section and more than one mile south of the Exxon State No. 8. *Id.* Mr. Jones concurs, and Mr. Simitz of the BLM has corroborated, that the Yates Formation in the back reef facies ceases to be recognizable as the formation nears the Capitan reef itself. **Transcript, Testimony of Mr. Jones, p. 219, l. 5-6; Ex. 28, BLM Memorandum, p. 1.**

The lithologies present in the Exxon State No. 8 driller's log and the Exxon State No. 8 e-log clearly show the presence of the Yates Formation within the Exxon State No. 8 and demonstrate that the Exxon State No. 8 is located in the back reef facies of the Capitan Reef

complex. **Ex. 25, Assessment Report, p. 14** (“The Magruder (Yates) is unquestionably present in the well.”); **Ex. 27, Response to BLM, p. 6**. Both the driller’s logs and e-log for the Exxon State No. 8 contain a geologic marker of thin, radioactive shale, which is characteristic of the Yates Formation. **Ex. 25, Assessment Report, p. 11; Ex. 33, Response to NMOCD, p. 5**. Dr. Havenor used this marker to establish the depth of the bottom of the Yates Formation underneath the Exxon State No. 8 by correlating the shale marker obtained from the e-logs of two other wells within the formation. **Ex. 25, Assessment Report, p. 11; Hearing Tr., Testimony of Dr. Havenor, p. 85, 1-20-25**. The e-logs from the Exxon State No. 8 and the two other wells exhibited the same radioactive marker and vuggy dolomite characteristic of the Yates Formation. **Ex. 25, Assessment Report, p. 11**. By analyzing the radioactive markers from the e-logs, Dr. Havenor confirmed and correlated the presence of the Yates Formation underneath the Exxon State No. 8. *Id.* Dr. Havenor also relied on Kelley’s published studies showing the southward thickening of the Yates Formation. *Id.*, p. 17.

Based on e-log correlations and Kelley’s studies, Dr. Havenor’s initially placed the bottom of the Yates Formation at 744 feet, 50 feet below the total depth of the Exxon State No. 8. Mr. John Simitz, Bureau of Land Management Geologist and expert on the Capitan Reef complex, corroborated Dr. Havenor’s conclusion in his Memorandum dated September 25, 2008. **Ex. 25, Assessment Report, p. 17; Ex. 28, BLM Memorandum, p. 1**. Mr. Simitz concurred with Dr. Havenor’s analysis of the Capitan Reef complex and stated “[i]t is our opinion that the type log in Mr. Havenor’s report correctly identifies the top of the Capitan Reef.” **Ex. 28, BLM Memorandum, p. 1**.

Based on a subsequent analysis of six (6) wells, including the Exxon State No. 8, and creation of a cross-section of the Yates Formation, Dr. Havenor concluded that the bottom of the

Yates Formation is more likely located at a depth of 802 feet, rather than at the depth of 744 feet that he originally reported. **Ex. 33, Response to NMOCD, p. 2-4.** The identifiable presence of the Yates Formation underneath the Exxon State No. 8, together with the position of the Exxon State No. 8 within the Capitan Reef complex, demonstrate beyond a reasonable degree of hydrogeologic probability that the Exxon State No. 8 is located within the back reef facies of the Capitan Reef. **Hearing Tr., Testimony of Dr. Havenor, p. 60, l. 3-5.**

Mr. Jones of the NMOCD, although a skilled and able petroleum engineer, is not a geoscientist and has misapprehended the location of the Exxon State No. 8 in relation to the Capitan reef itself. **Hearing Tr., Testimony of Mr. Jones, p. 219, l. 11-12.** Nonetheless, Mr. Jones himself agrees that the Yates Formation ceases to be recognizable closer to the actual Capitan reef. **Id., p. 209, l. 5-6** (“So the Yates kind of goes away as you get further on top of the reef.”). Thus, the undeniable presence of the Yates Formation underneath the Exxon State No. 8 demonstrates that the Exxon State No. 8 is not proximate to the reef itself. The existing literature from Huff and Kelley, and the conclusions from reef experts Mr. Simitz of the BLM and Dr. Havenor, all demonstrate and corroborate the accepted hydrological conclusion that the Exxon State No. 8 is well within the back reef facies, and not on or in the reef itself. **Ex. 25, Assessment Report, p. 17; Ex. 28, BLM Memorandum, p. 1.**

B. The Back Reef Facies of the Capitan Reef Complex Are Not Hydrologically Connected to the Capitan Aquifer and the Exxon State No. 8 Is Located Down-Gradient from the Protected Water in the Capitan Aquifer.

The Exxon State No. 8 is not connected to any section of the Capitan aquifer, including the sections of the Capitan aquifer that contain protected water. **Ex. 31, Annotated Reef Diagram.** First, there is no hydrological connection between the back reef facies of the Capitan Reef complex and the Capitan aquifer. **Ex. 25, Assessment Report, p. 18; Ex. 27, Response to BLM, p. 6; Ex. 28, BLM Memorandum, p. 1.** Second, the Exxon State No. 8 is located down-

gradient relative to the protected areas of the Capitan aquifer and is hydrologically isolated from the protected waters of the Capitan aquifer. **Ex. 27, Response to BLM, p. 6; Ex. 30, Discussion of Capitan Reef Aquifer Salinity, p. 1; Ex. 31, Annotated Reef Diagram.** Dr. Havenor's Annotated Reef Diagram illustrates both the location of the Exxon State No. 8 within the Capitan Reef complex and the direction of groundwater flow within the Capitan Reef complex. **Ex. 31, Annotated Reef Diagram.** The groundwater gradient is northeast from Carlsbad past the Exxon State No. 8, to the east, and then to the southeast – away from the protected waters in the Capitan aquifer. *Id.*

Only the western section of the Capitan aquifer contains protected water, and this area is located up-gradient from the Exxon State No. 8. The Capitan aquifer was originally a Permian sea. **Ex. 30, Discussion of Capitan Reef Aquifer Salinity, p. 2.** However, some northwest sections of the Capitan aquifer now contain water with a TDS concentration of less than 10,000 mg/l due the flushing of the naturally saline waters by the Pecos River. *Id.* This area of protected water in the Capitan aquifer occurs only near Carlsbad and the Pecos River, southwest and up-gradient of the Exxon State No. 8. *Id.* This conclusion is corroborated by the fact that salinity within the Capitan aquifer increases rapidly east of the Pecos River and east of the Exxon State No. 8. *Id., p. 2, 3; Hearing Tr., Testimony of Dr. Havenor, p. 65, l. 1-5.*

The Exxon State No. 8 is located six (6) miles northeast of the Carlsbad, and more than five (5) miles east of the Pecos River. **Ex. 27, Response to BLM, p. 6.** The City of Carlsbad Test Well, located within the Capitan Reef aquifer and 2.85 miles southeast of the Exxon State No. 8, has TDS levels of 23,800 mg/l at a depth of 900 feet and 22,400 mg/l at a depth of 60 feet. **Ex. 30, Discussion of Capitan Reef Aquifer Salinity, p. 7.** Thus, the portion of the Capitan Reef aquifer located down-gradient from the Exxon State No. 8 has TDS concentrations that

presently exceed and have always exceeded the maximum TDS concentration for protected water. *Id.*, 19.15.9.701(E)(2) NMAC.

i. The Back Reef Facies Are Not Hydrologically Connected to the Capitan Aquifer.

Due to its location in the back reef facies, the Exxon State No. 8 is not hydrologically connected to any section of the Capitan aquifer, including the protected waters west of and up-gradient from the Exxon State No. 8, and the unprotected waters down-gradient and to the east. The existing literature, Mr. Simitz's conclusions, and Dr. Havenor's analyses and reports, all conclude that the existence of an essentially impermeable limestone within the reef prevents any hydrologic communication between waters in the back reef facies and the Capitan aquifer. **Ex. 25, Assessment Report, p. 18; Ex. 27, Response to BLM, p. 6; Ex. 28, BLM Memorandum, p. 1.** Hiss determined that "the rock units surrounding the Capitan aquifer have significantly less permeability than the Capitan [reef] and, in most places, act as partial hydrologic barriers to movement of water in or out of the aquifer." **Ex. 30, Discussion of Capitan Aquifer Salinity, p. 4; Hearing Tr. P. 94 – 95, l. 7-35, 1-8.** As amplified by Dr. Havenor, "the real problem would be to demonstrate *how* back-reef fluids, such as water in/or disposed into zones such as the basal Exxon State #8's 684-694' zone, *could get into the known porous and permeable crestal area on the leading basin-edge portion of the reef.* This is especially true because the Exxon state wells are located about three miles, or more, north of the reef's crestal area..." **Ex. 33, Response to NMOCD, p. 5-6 (emphasis added).** Mr. Simitz of the BLM concurred with the accepted scientific literature: "...this does not mean that the porosity of the [Exxon State No. 8] injection interval grades into the Capitan Reef. The Capitan Reef in this area exhibits *none to little* porosity and does not appear to be hydrologically connected to the Capitan Reef." **Ex. 28, BLM Memorandum, p. 1 (emphasis added).** Consequently, water from the back reef facies

does not and cannot migrate through the impermeable limestone areas of the shelfward reef to encroach upon the Capitan aquifer. **Ex. 33, Response to NMOCD, p. 5-6.**

ii. The Exxon State No. 8 Is Located Down-Gradient from and Five (5) Miles East of the Protected Water in the Capitan Aquifer.

In addition to the practical absence of permeability as a result of the limestone barrier, waters near the Exxon State No. 8 are further isolated from the protected area of the Capitan aquifer as a result of the structural gradient and groundwater flows. **Ex. 27, Response to BLM, p. 6; Ex. 30, Discussion of Capitan Reef Aquifer Salinity, p. 1; Ex. 31, Annotated Reef Diagram; Hearing Tr., Testimony of Dr. Havenor, p. 62, l. 4-5.** As illuminated in Dr. Havenor's annotated diagram of the Capitan Reef complex, the groundwater gradient in the Capitan Reef aquifer traverses northeast, east and then southeast – which are away from the protected water supply in the Capitan aquifer. **Ex. 27, Response to BLM, p. 6; Ex. 30, Discussion of Capitan Reef Aquifer Salinity, p. 1; Ex. 31, Annotated Reef Diagram.** The groundwater gradient in the back reef facies is to the southeast, again away from the protected water in the Capitan Reel aquifer. **Ex. 27, Response to BLM, p. 6; Ex. 30, Discussion of Capitan Reef Aquifer Salinity, p. 1; Ex. 31, Annotated Reef Diagram.** The eastward gradient within the Capitan Reef aquifer increases from Carlsbad to Lovington, with a known dip of 1.5 degrees to the southeast. **Ex. 25, Assessment Report, p. 17.**

The Exxon State No. 8 is located more than five (5) miles east of the Pecos River and down-gradient from the protected water of the Capitan aquifer in the back reef facies of the Capitan Reef complex. **Ex. 30, Discussion of Capitan Reef Aquifer Salinity, p. 7.** Water disposed of in the Exxon State No. 8 migrates down-gradient toward the southeast, rather than up-gradient to the southwest, away from the protected area of the Capitan Reef aquifer. ***Id.*, p. 1; Ex. 33, Response to NMOCD, p. 8.** Moreover, the Exxon State No. 8 disposes of water on a

vacuum, and the well could not create any pressure that could conceivably drive water upward and against the existing gradient. **Ex. 37, Magnolia Review and Analysis, p. 1.**

Based on the unambiguous hydrological evidence, both Dr. Havenor and Mr. Simitz concur that the Exxon State No. 8 is simply not hydrologically connected to any protected section of the Capitan aquifer. **Ex. 25, Assessment Report, p. 18; Ex. 27, Response to BLM, p. 6; Ex. 28, BLM Memorandum, p. 1.** The NMOCD's concern that the water disposed of in the Exxon State No. 8 could reach the protected section of the Capitan aquifer arises from a misapprehension of the Exxon State No. 8's position within the back reef facies of the Capitan Reef complex and of the gradients within the reef complex and Capitan aquifer itself. Consequently, due to the absence of any hydrological connection between the back reef facies and the Capitan aquifer, and also due to the southeastern groundwater gradient, it is not geohydrologically possible that produced water disposed of in the Exxon State No. 8 could encroach upon the protected area of the Capitan aquifer. **Ex. 33, Response to NMOCD, p. 5-8.**

C. The NMOCD Failed to Identify Any Reasonable Hydrogeologic Basis for Opposing Mesquite's Application.

Instead of identifying any hydrogeologic basis for its opposition to Mesquite's application, the NMOCD relied on various applications, forms and reports from wells far beyond the area of review to speculate that there *might* be protected water *somewhere* in the vicinity of the Exxon State No. 8. **See, NMOCD Exs. 6-D through 6-I.** Notwithstanding this speculation, it is uncontroverted that no waters with TDS concentrations of 10,000 mg/l or less exist anywhere in the area of review, the greatly expanded search area south of the Exxon State No. 8 toward the actual Capitan reef, or in the back reef facies where the Exxon State No. 8 is located. **See, NMOCD Exhibits 6-D – 6-I.** Instead, the NMOCD relies on TDS concentrations from far outside the area of review and *up-gradient* from the Exxon State No. 8. For example, NMOCD

Exhibit 6-G shows a TDS concentration of 3,844 mg/l for a well located in the Barton Flats area, 4.58 miles north-northwest of the Exxon State No. 8 and four (4) miles outside the area of review. *See, NMOCD Ex. 6-G.* The NMOCD also relied on a report for a well located 2.5 miles northwest of the Exxon State No. 8, but closer to the protected sections of the Capitan aquifer. **NMOCD Exhibit 6-H.** Even that well had TDS concentrations of 11,200 and 11,700 mg/l, in excess of the regulatory maximum level. *Id.*

The NMOCD also misconstrues the Capitan Reef complex and the location of the Exxon State No. 8 within that complex. The NMOCD's conclusion that the Exxon State No. 8 is located on the top or edge of the Capitan reef itself simply does not comport with the lithologies in the area and the accepted hydrogeological studies. *Compare, NMOCD Exs. 4-E, 4-G, 4-H, and 6-J* (placing the Exxon State No. 8 on top of edge of Capitan reef), *with Ex. 25, Assessment Report, p. 11, 14, 17* (using a geologic marker to correlate the Exxon State No. 8 in the Yates Formation within the back reef facies); **Ex. 27, Response to BLM, p. 6** (“[T]he Magruder Field is clearly in the back reef environment...”); **Ex. 28, BLM Memorandum** (concurring with Dr. Havenor's analysis of the Yates Formation, location of the Exxon State No. 8, and the well's hydrologic isolation from the Capitan aquifer) **Ex. 29, Reef Illustration; Ex. 31, Annotated Reef Digram; Ex. 33, Response to NMOCD, p. 5.**

If the Exxon State No. 8 were located at the edge of the Capitan reef itself, as the NMOCD speculates, the lithologies would show massive limestones, rather than vuggy dolomite, and the Yates Formation would not be clearly present in the Exxon State No. 8. **Ex. 25, Assessment Report, p. 11, 14, 17; Ex. 27, Response to BLM, p. 6** (“The lithologies present in the Magruder field gradually transition southward of the study area into back-reef carbonates that were deposited behind the reef. The sandstones and anhydrites tongue into the reef about 3 to 5

miles south of the Magruder Field.”); **Ex. 29, Reef Illustration; Ex. 31, Annotated Reef Diagram; Ex. 33, Response to NMOCD, p. 5.** However, the Exxon State No. 8 driller’s log, e-log, and the e-logs of two nearby wells, clearly show the presence of the Yates Formation in the Exxon State No. 8 and its immediate vicinity. **Ex. 25, Assessment Report, p. 11, 14, 17.** Even Mr. Jones inappositely acknowledged that the Yates Formation “kind of goes away at the reef itself.” **Hearing Tr., Testimony of Mr. Jones, p. 219, l. 5-6.** Thus, the known lithologies and stratigraphy demonstrate that the Exxon State No. 8 is within the back reef facies of the Capitan Reef complex – in an area devoid of protected water – and hydrologically unconnected to any protected water. **Ex. 25, Assessment Report, p. 11, 14, 19-20; Ex. 28, BLM Memorandum p. 1-2; Ex. 33, Response to NMOCD, p. 5.**

III. Conclusion

For the reasons set forth above and presented in the hearing, Mesquite respectfully requests that the Hearing Examiners enter an order granting Mesquite’s Application to Amend Order SWD-180 to allow for disposal of produced water at a depth of 694 feet.

Respectfully submitted,

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CERTIFICATE OF SERVICE

I hereby certify that on this on this 20th day of October, 2008, I sent a true and correct copy of the foregoing and *Applicant Mesquite SWD, Inc.'s Closing Statement* via postage prepaid first class mail and electronic mail to:

Mr. Sonny Swazo, Esq.
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