BEFORE THE

NEW MEXICO ENERGY, MINERALS AND NATURAL RESOURCES

OIL CONSERVATION COMMISSION

**IN THE MATTER OF THE APPLICATION OF
PUBLIC SERVICE COMPANY OF NEW MEXICO
FOR REVIEW OF OIL CONSERVATION DIVISION
DIRECTIVE DATED MARCH 13, 1998
DIRECTING APPLICANT TO PERFORM
ADDITIONAL REMEDIATION FOR
HYDROCARBON CONTAMINATION,
SAN JUAN BASIN, NEW MEXICO** **CASE NO. 12033**

REBUTTAL TESTIMONY OF

TONI K. RISTAU

MAUREEN D. GANNON

RODNEY THOMAS HEATH

MARK J. SIKELIANOS

VALDA I. TERAUDS

SUBMITTED ON BEHALF OF

PUBLIC SERVICE COMPANY OF NEW MEXICO

APPLICANT

JULY 30, 1999

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REBUTTAL TESTIMONY OF
TONI K. RISTAU

Q. CAN YOU PLEASE STATE YOUR NAME, BUSINESS ADDRESS, AND QUALIFICATIONS AS A WITNESS IN THIS PROCEEDING?

A. My name is Toni K. Ristau and I am employed by Public Service Company of New Mexico ("PNM") at Alvarado Square, MS-0408, Albuquerque, New Mexico. I am currently serving as Director, Environmental Services, for PNM. I have extensive experience in the assessment and remediation of sites with groundwater and other contamination, and am familiar with the pit remediation project that PNM has been conducting since 1995 in the San Juan Basin of New Mexico.

Q. HAVE YOU SUBMITTED DIRECT TESTIMONY IN THIS PROCEEDING?

A. Yes.

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?

A. The purpose of my testimony is to: 1) address statements made about PNM's level of control of activities, operations, and access to the Hampton 4M site introduced under the direct testimony of Burlington Witness Louis Edward Hasely, 2) address statements made about the effectiveness of PNM's site characterization and remediation activities versus those of Burlington introduced under the direct testimony of Burlington Witnesses Louis Edward Hasely and Paul Rosasco and addressed in Burlington Exhibits 19, 20, 21, 22, and 23, and 3) address statements made about the allocation mechanism introduced under the direct testimony of OCD Witness William Olson.

Q. DOES PNM HAVE, OR HAS PNM HAD IN THE PAST, UNRESTRICTED ACCESS TO ALL PARTS OF THE HAMPTON 4M SITE?

A. No. In no case has PNM been able to access all portions of the site.

Q. WHY HAS PNM NOT HAD FULL, UNRESTRICTED ACCESS TO THIS SITE TO CARRY OUT ITS APPROVED REMEDIATION PLAN?

A. PNM is not the lessee, nor is PNM an operator at the Hampton 4M site. PNM's gas gathering and associated operations (such as dehydration of the gas) ceased on June 30, 1995, with the sale of PNM's gas gathering and processing assets to Williams. Though PNM is performing pit closure activities and groundwater management activities under its approved plans, PNM cannot interfere with any current production and gathering activities without the consent of the operators on site.

Q. HAS PNM EXPERIENCED ANY CONFLICTS OR PROBLEMS WITH OBTAINING SUFFICIENT ACCESS TO CARRY OUT ITS REMEDIATION ACTIVITIES IN ACCORDANCE WITH ITS APPROVED PLANS, AT THE HAMPTON 4M SITE OR AT OTHER SITES?

A. Yes, occasionally. For example, as was discussed in the direct testimony of PNM Witnesses Maureen Gannon, Mark Sikelianos, and Valda Terauds, there are sometimes logistical difficulties related to well pad configuration and location. In the case of the Hampton 4M, the well pad is within a fairly narrow arroyo area, on a steep slope, making it difficult to excavate and stockpile soils onsite safely and

in a manner that neither impedes continuing operations of the well or other wellhead equipment nor causes potential for environmental degradation. In such cases, PNM has, under its plan, the option of working with the production operator to stockpile and landfarm the soils on another location within the operator's leasehold if feasible. If this is not feasible, PNM has the option to seek a temporary use permit or permission from either the federal or private landowner to stockpile and/or landfarm the soils in a safer location nearby. If neither of these preferred options is feasible, PNM can dig the contaminated soils and haul them to a commercial landfarm, at considerably more expense.

Q. HAVE THE PRODUCTION OPERATORS GENERALLY BEEN COOPERATIVE IN ALLOWING PNM SUFFICIENT ACCESS AND USE OF THE SITE TO COMPLETE ONSITE LANDFARMING AND OTHER ASSOCIATED REMEDIATION WORK ON THE PRODUCER'S LEASEHOLD?

A. Yes, the production operators, as well as the gathering system operators, have been very cooperative in most instances in allowing PNM access to remediate and close PNM's former dehydration pits on their locations. However, we have recently encountered a situation where an operator has been reluctant to allow access for PNM to perform and complete its remediation, including onsite landfarming, which is the most cost-effective and environmentally sound method of remediating contaminated soils and closing the wellhead pits.

949

Q. WHICH OPERATOR HAS CHALLENGED PNM'S RIGHT OF ACCESS TO PERFORM REMEDIATION ACTIVITIES, INCLUDING LANDFARMING?

A. Though Burlington has allowed PNM to landfarm onsite at Burlington's locations for the last three years of PNM's approved pit closure program, Burlington has recently challenged PNM's right of access to remediate sites. We have been instructed to remove our landfarm operations from Burlington controlled properties (see PNM Exhibits 64 and 65).

Q. WHAT ARE THE EFFECTS OF BURLINGTON'S UNWILLINGNESS TO ALLOW PNM SUFFICIENT ACCESS TO COMPLETE REMEDIATION ACCORDING TO PNM'S APPROVED REMEDIATION PLANS?

A. Burlington's challenge to other entities who are remediating contamination at these sites makes it clear that Burlington considers itself to be in sole and total control of these sites and any contamination on these sites. Under these circumstances, it is unreasonable to expect others to remediate contamination over which they have no control, particularly when the approved method of remediation is through source control.

In addition, by its refusal to allow PNM access to landfarm on site, Burlington will greatly increase the cost of remediating and closing dehydration pits. It is only fair that Burlington either be required to close these pits itself according to PNM's approved remediation plans, or that Burlington be required to pay the

incremental additional costs incurred by PNM, who is actually conducting the remediation and closure activities.

Q. DO YOU AGREE WITH STATEMENTS MADE REGARDING PNM'S WILLINGNESS TO ENGAGE IN REMEDIATION ACTIVITIES BY BURLINGTON'S WITNESSES HASELY AND ROSASCO?

A. No, I do not.

Q. PLEASE EXPLAIN THE AREAS WHERE YOU CANNOT AGREE WITH THESE STATEMENTS, AND PROVIDE YOUR REASONS FOR NOT AGREEING.

A. Mr. Rosasco's testimony, as well as Burlington's Exhibits 19, 20, and 21, contain statements representing that recent sampling near the Hampton 4M confirms that prior activities of PNM and, in particular the discharge of hydrocarbons into an unlined pit from PNM's former dehydrators, are a continuing active source at this well site. I cannot agree with these statements because the data, including Burlington's own data, in fact demonstrate the opposite conclusion. Please see the direct and rebuttal testimony of PNM Witnesses Terauds and Gannon for a more detailed display and analysis of the data that Burlington cites in support of its conclusion.

Also, Burlington's witnesses and the exhibits supplied by Burlington frequently cite sampling data and other site characterization information and analyses to the OCD as resulting from Burlington's efforts at the Hampton 4M site, when in reality the sampling data and other site characterization information presented by

Burlington resulted from PNM's site characterization and remediation work at the site rather than from Burlington's efforts. Please see the testimony of PNM Witnesses Gannon and Terauds for additional detail.

Q. HAS BURLINGTON EVER REPRESENTED TO THE OCD OR TO PNM THAT BURLINGTON WILL CONDUCT SOURCE REMOVAL WORK FOR THE ENTIRE HAMPTON 4M LOCATION?

A. Yes. See Burlington Exhibit 21, where Mr. Hasely (Burlington) represents to the OCD and (by copy of the letter) to PNM that . . . "BR [Burlington] will conduct source removal work for the entire Hampton 4M location . . ."

Q. WAS EITHER THE OCD OR BURLINGTON EVER MADE AWARE OF PNM'S CONCERNS REGARDING BURLINGTON'S PROPOSED REMEDIAL EFFORTS?

A. Yes. See Burlington's Exhibits 22 and 23, where PNM expressed its concerns to both Burlington and the OCD that Burlington's planned remediation efforts would: (1) not be effective; (2) would result in the removal of the only remediation system on site that, to date, has removed any substantial amount of the free product contamination (i.e., PNM's free product recovery well); (3) would result in the removal or disruption of the monitoring well network installed at the site under PNM's direction and thus disrupt the collection of data that would aid in determining whether the source of free product at the site had been effectively located and remediated; and (4) could exacerbate the downgradient

and offsite spread of the contamination due to the release of the free product at this site.

Q. DID EITHER THE OCD OR BURLINGTON HEED THESE CONCERNS?

A. As adjudged by the direct testimony of OCD Witness Olson and Burlington Witnesses Hasely and Rosasco, no, they did not.

Q. IS THERE ANY INDICATION THAT PNM'S CONCERNS WERE JUSTIFIABLE?

A. Yes. Sampling data and other information compiled by PNM subsequent to Burlington's remediation efforts initiated in November 1998 indicate that indeed, Burlington's remediation efforts have not been effective and that Burlington's remediation effort have removed the only effective free-product removal mechanism at the site; that Burlington destroyed six of the onsite monitoring wells and thus prevented effective data collection for a period of several months; and that Burlington has in fact exacerbated cross-gradient and off-site contamination at the Hampton 4M site. Please see the direct and rebuttal testimony of PNM Witness Terauds for additional detail.

Q. HAS BURLINGTON EVER COMPLETED SOURCE REMOVAL WORK FOR THE ENTIRE HAMPTON 4M LOCATION?

A. No. Contrary to the representations of Burlington's witnesses, Burlington has exhaustively re-remediated PNM's former pit location, which was shown by the data prior to Burlington's initiation of its own remediation activities to <u>not</u> be a continuing source of contamination at this site, but has only lightly touched upon

its own potential source areas at this site. Burlington has yet to address the substantial volume of free product that it has released upgradient of PNM's former pit on this location.

Q. HAVE BURLINGTON'S SOURCE REMOVAL ACTIVITIES TO DATE EFFECTIVELY REMEDIATED THE HAMPTON 4M SITE?

A. No. Again, contrary to the representations of Burlington's witnesses, Burlington's remediation activities to date have not been effective. In fact, Burlington's remediation activities have conclusively refuted the statements of Burlington's witnesses representing that PNM's former pit was a major source of free product contamination, and have confirmed PNM's statements that the former PNM dehydrator pit was not a substantial source of free product, and thus not a substantial contributor to groundwater contamination, at this site.

Further, Burlington's efforts have confirmed that PNM's initial remediation of its former pit was indeed effective, and that soils beneath PNM's former pit met OCD closure guidelines for benzene and BTEX subsequent to PNM's soils remediation efforts. The samples taken from the soil column beneath the former PNM pit reveals that no significant contamination went to groundwater through PNM's pit (see the direct and rebuttal testimony of PNM Witnesses Terauds and Gannon for additional detail).

Also, as presented in the direct and rebuttal testimony of PNM Witnesses Terauds and Gannon, and contrary to statements made by Burlington's Witnesses Hasely and Rosasco, additional data collected subsequent to Burlington's remediation

efforts suggest that there is still a substantial volume of free product at this site. The indicators of free product contamination have been detected upgradient of PNM's former pit, as evidenced by the increase of total dissolved phase concentrations of hydrocarbons (BTEX) in monitoring wells, an increase in benzene concentrations, and the reappearance of free-phase product in monitoring wells that are upgradient, cross-gradient, and in the vicinity of PNM's former operations, but that are downgradient of Burlington's potential source areas at this site.

Q. DO YOU AGREE WITH THE STATEMENTS BY BURLINGTON'S WITNESSES THAT THE FREE PRODUCT CONTAMINATION AT THE SITE HAS BEEN EFFECTIVELY ADDRESSED BY BURLINGTON'S REMEDIATION ACTIVITIES TO DATE?

A. No. In addition to the factors discussed above, which indicate that Burlington's witnesses are incorrect regarding the completion of remediation at this site, none of Burlington's witnesses have explained the apparent anomaly in Burlington's liquid hydrocarbon production at this site, where gas volumes produced by Burlington from the well stayed relatively high, but liquids production dropped to zero for a substantial period of time. As this has not been explained by Burlington, the most logical explanation is the one offered by PNM – those liquid hydrocarbons were released by Burlington from its operations at the site, and are currently residing as free phase hydrocarbons on the water table in the vicinity of the well pad, and as dissolved phase contamination in groundwater downgradient

of Burlington's operations at the site. See the direct testimony of PNM Witnesses Terauds and Heath for more detail.

Q. DO YOU AGREE THAT THE ALLOCATION/APPORTIONMENT MECHANISM CHOSEN BY THE OCD FOR RESPONSIBILITY AT THE HAMPTON 4M SITE WAS REASONABLE?

A. No. As explained by OCD Witness Olson in his direct testimony, the OCD chose a physical "line in the sand", initially drawn slightly upgradient of PNM's former operations, as its method for allocating remediation responsibilities at this site. This is an adequate allocation method, perhaps, for addressing soil contamination, because the contamination residing in the soil typically does not travel very far from the point where it was discharged, and thus this allocation for soils cleanup acknowledges that the operator who released the contamination is responsible for cleaning up that particular increment of contamination. Please see my direct testimony (PNM Witness Ristau) for additional detail, as well as the testimony of PNM Witnesses Terauds and Gannon.

However, for sites where there is more than one source of soil contamination, and for sites where there is groundwater contamination, such an allocation is not reasonable. Allocating responsibility for soil and groundwater contamination that originates upgradient of the responsible party's operations to that responsible party is not reasonable and is not in accord with scientific and engineering realities regarding the release of contamination. In order for the allocation to be reasonable, each entity should be held accountable for the quantum of

contamination it released. This is particularly true for groundwater contamination, including free phase hydrocarbons such as those released by Burlington at this site. In contrast to contaminants that reside in the soils, which do not move very much or very quickly from the point where they were released to the soils, dissolved phase and free phase contamination moves with the groundwater and away from its release point relatively quickly, particularly at a site such as the Hampton 4M, where there is a steep gradient from the points where Burlington released free product to the environment to the area of PNM's former operations and to offsite areas. Also, the movement of free product to areas downgradient from the point where the product was originally released will contaminate soils near the water table as well as the groundwater in those downgradient areas, which is what has happened at the Hampton 4M site. In such an instance, a portion of the soil contamination present near the water table in downgradient areas, in this case on PNM's side of the "line in the sand", should also be attributed to Burlington. Burlington, as the party who originally released the contaminants to the environment, should be held responsible for its cleanup rather than PNM. Please see the direct and rebuttal testimony of PNM Witnesses Terauds and Gannon for additional detail.

Q. WHAT, IN YOUR OPINION, WOULD CONSTITUTE A REASONABLE ALLOCATION OR APPORTIONMENT OF RESPONSIBILITY AT THE HAMPTON 4M SITE?

000957

A. In my opinion, based upon the direct testimony of the Burlington, OCD, and PNM witnesses, the overwhelming evidence shows with reasonable scientific certainty that Burlington should be held responsible for all contamination (soil, dissolved phase groundwater, and free product contamination) resulting from Burlington's release of free product, which Burlington alone owns and controls, to the environment. PNM should be held accountable for the soils contamination resulting from its former operations at the site, which PNM has already remediated. Thus, PNM should be relieved of any further responsibility for remaining contamination at the Hampton 4M site, since the overwhelming weight of evidence also shows that PNM has not only cleaned up all contamination that could have resulted from its former operations, but has cleaned up a substantial increment of the contamination attributable to the free phase hydrocarbon released by Burlington at this site as well.

Q. DOES OCD HAVE A MECHANISM IN PLACE TO EFFECT AN ALLOCATION SUCH AS THE ONE YOU HAVE DESCRIBED?

A. Yes. OCD has policies and provisions that, in situations where there is more than one source of contamination at a site, allow for a party that is downgradient of a continuing or unaddressed source of contamination to cease its remediation efforts once background levels are attained.

Q. WHAT ARE PNM'S BACKGROUND LEVELS AT THE HAMPTON 4M SITE?

A. Background levels for PNM at this site are established on the basis of the water quality upgradient from PNM's potential source areas at the site. As explained in the direct testimony of PNM Witnesses Terauds and Gannon, monitoring wells upgradient to PNM's former pit contained measurable free phase hydrocarbons. Subsequent to the initiation of PNM's remediation activities at the Hampton 4M site, monitoring wells measuring the groundwater contamination levels beneath PNM's pit contained levels of free phase hydrocarbons that had decreased and then stabilized, approaching the levels measured in monitoring wells that were upgradient from PNM's former operations. PNM, by removing over 1050 gallons of free phase hydrocarbons, had more than remediated any potential contribution through its pit. Further, PNM's remediation system was no longer having any appreciable effect on reducing the amount of free phase hydrocarbons in the vicinity of PNM's former pit due to the continuing inflow of contaminants from upgradient sources controlled by Burlington. Therefore, PNM has already attained remediation to PNM's background levels at this site.

Q. ARE THE WELLS THAT ESTABLISH UPGRADIENT AND BACKGROUND CONCENTRATIONS FOR THE AREA RELATED TO PNM'S FORMER OPERATIONS STILL IN PLACE?

A. No. All of these monitoring wells that PNM had installed to establish upgradient/background levels and concentrations of free phase and dissolved phase hydrocarbons were destroyed by Burlington's excavation activities in November 1998 through February 1999. PNM presently has no means to monitor

the upgradient concentrations that constitute background water quality for its former operations, with the sole exception of newly installed well MW-13.

Q. HAS PNM COMPLETED ITS REMEDIATION ACTIVITIES AT THIS SITE WITH RESPECT TO SOIL CONTAMINATION CONTRIBUTED BY ITS FORMER PIT?

A. Yes. PNM completed its soils remediation activities. In addition, all the soils beneath and in the vicinity of PNM's former pit, contaminated or not, extending to several feet below the groundwater table, were later removed again by Burlington. PNM has had no gas gathering operations or facilities at this site since June 30, 1995. Thus, there can be no soil contamination remaining at this site that could be attributed to PNM's operations or equipment.

Q. HAS PNM COMPLETED REMEDIAL ACTIVITIES AT THIS SITE WITH RESPECT TO ITS CONTRIBUTION TO GROUNDWATER CONTAMINATION?

A. Yes. As discussed in summary above and in more detail by PNM Witnesses Terauds, Gannon, and Sikelianos, PNM recovered over 1050 gallons of free product released by Burlington at this site. As has been discussed in the direct testimony of PNM Witnesses Terauds and Gannon, the encroaching free phase hydrocarbon plume has far overshadowed any dissolved phase contribution to groundwater contamination that could have been caused by PNM; but for the presence of the free product released by Burlington, PNM's remediation of the contaminated soils in the vicinity of its former pit and any resulting dissolved

phase groundwater contamination would be complete by now. PNM has done more than its share of groundwater remediation, and can do no more unless and until the upgradient releases of free product by Burlington and the dissolved phase contamination resulting from those releases are addressed.

Q. HAS PNM SUBMITTED A CLOSURE REQUEST TO OCD FOR THIS SITE?

A. Yes, as shown in PNM Exhibit 29.

Q. HAS OCD RESPONDED TO PNM'S REQUEST FOR CLOSURE?

A. No, not as of the date of the filing of this testimony.

Q. HAS OCD RESPONDED TO PNM'S REQUESTS FOR CLOSURE AT OTHER DEHYDRATOR SITES WHERE UPGRADIENT, BACKGROUND HYDROCARBON CONTAMINATION HAS BEEN ESTABLISHED?

A. Yes. For example, OCD has accepted a closure request from PNM for the Cozzens site, where there was free product released by the production operator (in this case, Burlington) at the site and where, as is the case at the Hampton 4M, PNM clearly did not release the free product.

Q. AT OTHER SITES, WHERE CONTAMINATION FROM OTHER SOURCES HAS BEEN DETECTED SUBSEQUENT TO PNM'S COMPLETION OF ITS REMEDIATION ACTIVITIES AT THE SITE AND WHERE THE OCD HAS APPROVED CLOSURE FOR PNM'S PIT, WHAT CONTINUING ACTIVITIES ARE REQUIRED BY PNM?

A. None.

Q. BASED ON YOUR EXPERIENCE WITH THE PIT PROGRAM FOR PNM, SHOULD THIS SITE BE HANDLED ANY DIFFERENTLY?

A. No.

Q. ARE THE OPINIONS IN YOUR TESTIMONY BASED UPON YOUR EDUCATION, TRAINING, AND EXPERIENCE IN THE ENVIRONMENTAL FIELD, AS WELL AS UPON A REVIEW OF THE INFORMATION DEVELOPED AT THE HAMPTON 4M SITE?

A. Yes.

Q. ARE YOUR OPINIONS BASED UPON REASONABLE SCIENTIFIC CERTAINTY?

A. Yes.

Q. DOES THIS CONCLUDE YOUR TESTIMONY?

A. Yes.

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

IN THE MATTER OF THE HEARING CALLED
BY THE OIL CONSERVATION COMMISSION
FOR THE PURPOSE OF CONSIDERING:

APPLICATION OF PUBLIC SERVICE COMPANY OF NEW MEXICO FOR *DE NOVO* HEARING ON ORDER NO. R-11134 ISSUED BY THE NEW MEXICO OIL CONSERVATION DIVISION IN

CASE NO. 12,033

AFFIDAVIT

STATE OF NEW MEXICO)
)SS.
COUNTY OF BERNALILLO)

I, Toni K. Ristau, upon being first duly sworn according to law, under oath, depose and state: That I am Director of Environmental Services for Public Service Company of New Mexico, and that I have read the foregoing Rebuttal Testimony, including exhibits. I further affirmatively state that I know the contents thereof and that they are true and correct to the best of my knowledge and belief.

SIGNED this 29th day of July, 1999.

Toni K. Ristau
TONI K. RISTAU

SUBSCRIBED AND SWORN to before me this 29th day of July, 1999.

Dolores Moreno
Notary Public

[My Commission Expires: 9.28.99]

000963

BEFORE THE

NEW MEXICO ENERGY, MINERALS AND NATURAL RESOURCES

OIL CONSERVATION COMMISSION

IN THE MATTER OF THE APPLICATION OF
PUBLIC SERVICE COMPANY OF NEW MEXICO
FOR REVIEW OF OIL CONSERVATION DIVISION
DIRECTIVE DATED MARCH 13, 1998
DIRECTING APPLICANT TO PERFORM
ADDITIONAL REMEDIATION FOR
HYDROCARBON CONTAMINATION,
SAN JUAN BASIN, NEW MEXICO CASE NO. 12033

REBUTTAL TESTIMONY OF

MAUREEN D. GANNON

SUBMITTED ON BEHALF OF

PUBLIC SERVICE COMPANY OF NEW MEXICO

APPLICANT

JULY 30, 1999

000964

OCC CASE NO. 12033
REBUTTAL TESTIMONY OF
MAUREEN D. GANNON

Q. CAN YOU PLEASE STATE YOUR NAME AND YOUR PLACE OF EMPLOYMENT?

A. My name is Maureen D. Gannon and I am employed by Public Service Company of New Mexico ("PNM") in the Environmental Services Department.

Q. HAVE YOU PREVIOUSLY SUBMITTED TESTIMONY IN THIS CASE?

A. Yes, I presented pre-filed direct testimony on behalf of PNM.

Q. WHAT IS THE PURPOSE OF YOUR REBUTTAL TESTIMONY?

A. My rebuttal testimony addresses certain issues raised by Burlington Witnesses Louis Edward Hasely and Paul V. Rosasco. I am also providing rebuttal testimony to certain issues raised by Oil Conservation Division ("OCD") Witness William C. Olson.

Q. WHAT ARE THE ISSUES THAT YOU WILL ADDRESS WITH RESPECT TO THE TESTIMONY OF BURLINGTON WITNESS HASELY?

A. First, I will address Mr. Hasely's characterization of Burlington's early investigation and remediation efforts at the Hampton 4M site. Second, I will address his assessment of PNM's remediation efforts at the site. Third, I will address Burlington's remediation efforts which took place from November 1998 to February 1999.

Q. WHAT ISSUES DO YOU HAVE WITH THE CHARACTERIZATION OF BURLINGTON'S EARLY INVESTIGATION AND REMEDIATION EFFORTS BY BURLINGTON WITNESS HASLEY?

A. On page 5, lines 13 to 19 of his direct testimony, Burlington Witness Hasely indicates that after Burlington became aware of a contamination problem at the

000965

Hampton 4M site, Burlington participated in initial efforts to investigate and remediate the problem. He goes on to describe the efforts undertaken by Burlington in this regard.

While what Burlington Witness Hasely says is mostly accurate, it would be a mistake to construe these activities as constituting an adequate or full investigation at this site.

Q. WHY DO YOU SAY THAT THE INVESTIGATION WAS NOT ADEQUATE?

A. For several reasons. First, Burlington performed nine or ten relatively shallow soil borings on its portion of the well pad. This happened in the April 1997 timeframe. The well pad is fairly large, and more soil borings were necessary to adequately characterize the contamination at this site. In addition, Burlington uses laboratory sampling only on occasion. Their field personnel tend to favor the use of a hand-held photoionization detector (PID) to measure the presence of organic vapors on site. As stated in my prefiled testimony, field PIDs are not quantitatively accurate and really only serve as a means for field screening to help in determining when to cease excavation and/or collect a laboratory sample. In particular, PID readings are subject to "operator error", given that the PID must be field calibrated, and the readings are approximate and are not quantitative.

There is also a serious question concerning the adequacy of Burlington's soil remediation efforts. Burlington has not provided nearly the intensity of effort in investigating and remediating its own potential release points at the site as it has in re-remediating soils already cleaned up by PNM. As has been pointed out

repeatedly, a likely source of the free product at the site, as well as of dissolved phase and soils contamination, is from Burlington's old tank battery and former tank discharge pit located on the southern end of the wellpad.

Burlington excavated in an area near its former tank battery on the southeastern portion of the well pad. However, this excavation was not thorough enough to remediate the contaminated soils related to Burlington's operations on the southern (upgradient) portion of the wellpad, nor was it sufficient to identify release points for contamination at the site. We know from Burlington's records that soil contamination was located at sixteen feet below surface. We also know from Burlington's records that the excavation only went to fifteen feet so we have documented contamination left in place on Burlington's part of the well pad.

In the case of its groundwater contamination investigations, in June 1997, Burlington put in four temporary wells (which were TPW-4, 5, 6 and 7). These wells showed significant levels of dissolved phase BTEX contamination. In addition, free phase hydrocarbons were detected in another installed temporary well, TPW-2, located upgradient of PNM's former operations and downgradient of Burlington's existing operations. All of these temporary wells should have been completed as permanent monitoring wells and allowed to reach steady state conditions in order to provide more accurate and representative readings. Burlington, however, chose to remove the temporary wells before groundwater in the wells could equilibrate and provide more accurate and meaningful readings.

The work done by Burlington at this site in 1997 and through October of 1998 was rather limited. Burlington was first notified in early February 1997 of

groundwater contamination in MW-4 (upgradient of PNM's former operations and downgradient of Burlington's existing tank battery). Between April and June of 1997, Burlington installed the off-site collection trench, attempted to excavate in the area of their former tank discharge pit and installed seven temporary wells which were removed shortly after installation. The next work conducted at the site by Burlington occurred almost one year later in May of 1998 when Burlington installed monitoring wells MW-9 and MW-10. After that time, no other work was performed on site by Burlington until one week prior to the first OCD hearing, November 10, 1998, at which time Burlington began a rather high profile but indiscriminate approach to mass soil removal at the site. So between June 1997 to May 1998, Burlington did not conduct any additional investigation activities at the site. In fact, PNM has conducted quarterly sampling events in all wells at the Hampton 4M since January of 1997 and a one-time sampling event in the off site landowner well, and Burlington has consistently used all of the PNM generated data to prepare its documentation and reports. To our knowledge, Burlington has performed groundwater monitoring on an infrequent and limited basis. As evidenced in PNM Exhibit 13 of our prefiled testimony, since January 1997, PNM has not ceased its groundwater remediation activities at the site. Today, we continue to perform monitoring of all groundwater monitoring wells on and off site.

Q. WHAT DID PNM DO AT THIS SITE FROM THE JUNE 1997 TO MAY 1998 TIME FRAME?

000968

A. I covered PNM's activities at this site in some detail in my direct testimony so I will not go over that again in rebuttal. However, PNM Exhibit 13 provides a useful summary of PNM's activities during this time frame and throughout the history of the discovery of groundwater contamination at the site.

Q. ON THE "PLAN OF ACTION" SECTION ON PAGE 4 OF BURLINGTON'S EXHIBIT 7, IT IS STATED THAT "NAPL RECOVERY SHOULD BE IMPLEMENTED IN MW-2." WAS THIS EVER DONE?

A. Yes, but Burlington did not do it. It was done by PNM, with the initiation of PNM's free product recovery system in MW-6, a free product recovery well designed to better remove free phase hydrocarbons.

Q. IN THAT SAME SECTION AND PAGE ON BURLINGTON EXHIBIT 7, IT STATES "BURLINGTON PROPOSES CONSTRUCTING A SMALL PAD OFF SITE AND UPGRADIENT OF THE WELL LOCATION (MW-4) TO CONDUCT AN INVESTIGATION OF THE GROUNDWATER." WAS THIS DONE?

A. No. Burlington never identified the source of groundwater contamination upgradient of MW-4. No pad was constructed off site. And, in fact, PNM, in cooperation with Burlington, performed the installation of MW-1, the furthest upgradient well located south of the well pad. MW-1 (through PNM's sampling efforts) has consistently shown BTEX concentrations below WQCC standards since its existence, thus indicating that the source of contamination is on the well pad, upgradient of MW-4 and not in all probability coming from an off site

source. Contrary to their proposal, Burlington has yet to identify the source of contamination upgradient of MW-4.

Q. ON PAGE 11 LINE 5 TO 8 OF THE DIRECT TESTIMONY OF BURLINGTON WITNESS HASELY, HE REFERS TO AN OCD LETTER DATED NOVEMBER 24, 1997 WHICH IS BURLINGTON EXHIBIT 10. MR. HASELY STATES THAT THIS LETTER IS AN APPROVAL OF BURLINGTON'S WORK PLAN DATED SEPTEMBER 19, 1997 WITH SOME ADDITIONAL CONDITIONS. DID BURLINGTON FULFILL THE ADDITIONAL CONDITIONS AS SET FORTH IN THE OCD LETTER ATTACHED AS BURLINGTON EXHIBIT 10?

as per test. 8/26/99

A. No, it did not. The OCD's letter of November 24 specifically requires Burlington to install one well "at the location of temporary monitoring well TPW-7" (Burlington Exhibit 10). Burlington has never installed such a well.

Q. BASED ON YOUR EXPERIENCE, WOULD YOU EXPECT THIS WELL TO BE SIGNIFICANT?

A. Yes. TPW-7 was in the area of Burlington's former tank operations and tank discharge pit. A well in this area would provide valuable data on the potential source or release point of the hydrocarbons that constitute groundwater contamination in this area. In addition, we know from the test results in TPW-7 that there were very high levels of benzene detected in groundwater sampled from the well (benzene at 33,220 ppb or 3,322 times the WQCC standard). Given our experience at this site, we expect that if TPW-7 had been left in place, free product would have been detected. A permanent monitoring well in this location

000971

could confirm this. If free product was detected at this location, it would provide additional evidence regarding the release point of the free product, and would provide valuable information on additional source removal that Burlington could do to address the release of hydrocarbons from its operations. Burlington's workplans, like PNM's workplans and groundwater management plan, identify source removal as the "first action" at a site where there is contaminated groundwater, because removal or cutoff of the source of contaminants is the single most cost-effective action that can be taken to minimize impacts to water.

Q. DO YOU KNOW WHY BURLINGTON HAS NOT INSTALLED A MONITORING WELL IN THE LOCATION OF FORMER MW-7?

A. If there is a reason, they have not shared it with me. I also am unaware of why the OCD has not taken any action to require Burlington to comply with this directive as stated in the OCD's letter of November 24, 1997 (Burlington Exhibit 10). As I stated before, this monitoring well could provide crucial data concerning source(s) or release point(s) of ongoing contamination at this site.

Q. ON PAGE 12 LINES 13 THROUGH 16, BURLINGTON WITNESS HASELY STATES THAT PNM TOOK NO NEW ACTION TO THE DIVISION'S MARCH 13, 1998 DIRECTIVE. DO YOU AGREE WITH THIS ASSERTION?

A. No, I do not. PNM appealed this directive. This is really a gratuitous and misleading comment directed against PNM. PNM's record of activity at this site speaks for itself. Up to March 1998 time frame, PNM was the driver for both the investigation and remediation of the site. PNM had certainly done more than

Burlington had up to this point. We excavated our former pit, performed vertical extent drilling, installed and surveyed in 8 monitoring wells, and performed quarterly groundwater sampling and consistent reporting to both the OCD and Burlington by March 1998. We had also initiated free product recovery from the groundwater. Burlington had not initiated any free product recovery. In addition, PNM continued to operate its free product recovery system and conducted quarterly monitoring of its wells even after the March 13, 1998 directive. The only thing that interfered with these efforts was Burlington's obliteration of our monitoring well network and free product recovery system set-up in November of 1998.

Q. ON PAGE 14, LINES 6 THOUGH 7 OF MR. HASELY'S TESTIMONY, HE STATES THAT "NO EFFORT TO CLEAN UP THE HAMPTON 4M WELL SITE COULD BE EFFECTIVE UNTIL THE AREA SURROUNDING THE OLD PNM UNLINED DEHYDRATOR PIT WAS REMEDIATED." DO YOU AGREE WITH THIS ASSESSMENT?

A. No. Burlington Witness Hasely makes the same assertion at page 15, lines 14 through 16 of his testimony. The problem with remediation at this site was that the primary source of the free product was and is coming from upgradient of PNM's pit, and the release point is in the area of Burlington's operations. Unless and until the point of release source is identified and halted, groundwater will simply continue to be contaminated and remediation efforts in the area of PNM's former pit will be futile. Indeed, this is borne out by the data from recent

000972

sampling events by PNM; PNM Witness Valda Terauds discusses these data in more detail.

Q. AT PAGE 15 LINE 2, BURLINGTON WITNESS HASELY STATES THAT PNM DID NOT REMEDIATE THIS SITE. IS THIS STATEMENT CORRECT?

A. No. Burlington Witness Hasely has only to recall his experience and observations on site as well as the numerous analytical and progress reports prepared by PNM and shared with Burlington to know that this is not the case. PNM remediated over 300 cubic yards of soil from its former unlined pit. PNM also removed 1,050 gallons of free product from the groundwater. It is clear that PNM remediated the site as best it could within the existing limitations. Again, it must be reiterated that PNM was unable to conduct further remediation due to the fact that significant source areas were present upgradient of PNM's former operations which had yet to be identified, ceased and remediated. As is also pointed out by PNM Witness Ristau, PNM did not control this site and had no means to control or cause the upgradient release of contamination from Burlington's operations. PNM has never claimed that it did or even could completely remediate this site. In fact, PNM appealed the OCD directive for PNM to remediate the site because PNM had identified that there were upgradient sources or release points of significant amounts of free product. We explicitly recognized that further remediation efforts by PNM would be futile until Burlington characterized and addressed its release points or sources upgradient from PNM's former operations. Complete site remediation is dependent upon Burlington identifying and

addressing the source of contamination in the area upgradient of PNM's former pit.

Q. AT PAGE 16, LINE 9, BURLINGTON WITNESS HASELY IS ASKED WHETHER BURLINGTON HAS REMEDIATED THE HAMPTON 4M SITE. DO YOU AGREE WITH HIS RESPONSE TO THAT QUESTION?

A. What I note is that Burlington Witness Hasely does not give a "yes" or "no" answer to this question. His answer is equivocal indicating only that Burlington has excavated the "apparent source material at this site." The fact of the matter is that Burlington has not remediated this site. Burlington has not even excavated "the apparent source material at this site," in that they have left significant amounts of contamination in place on the southern portion of the wellpad in the area of their former and existing operations.

If Burlington had effectively removed the source materials at this site and had adequately addressed release points for the contamination, the amount of contamination in the monitoring wells onsite and offsite that are impacted by the groundwater plume should start to attenuate. By contrast, PNM has shown, through recent sampling, that the concentrations of benzene, as proved by the recent sampling data, show increases in benzene levels in the monitoring wells. The contamination at the site is increasing, rather than decreasing as one would expect if Burlington's remediation efforts had been effective.

Another indicator of the effectiveness, or lack of effectiveness, of Burlington's remediation efforts is the amount of contamination in the seep area at the toe of the wellpad. There is a hydrocarbon sheen on the water in the seep area that has

persisted long after Burlington removed what they considered to be the source areas at this site. Analysis of a sample collected from this seep area in 1999 by Mr. William Olson of the OCD indicates a benzene concentration of 40 ppb (4 times the WQCC standard and 8 times the drinking water standard) in the seep. Burlington's remediation efforts, which were directed primarily in the area of PNM's former operations, were unsuccessful. Had PNM been required to continue to remediate in the area of its former pit, it too would have been unsuccessful, as this pit area has clearly been contaminated by upgradient releases from Burlington's operations. The evidence of an upgradient source or release point in the area of Burlington's operations is compelling, and the failure of Burlington's recent efforts to remediate the site by addressing only the contamination that resided in the area of PNM's former pit confirms this fact.

Q. WHAT ISSUES DOES YOUR REBUTTAL TESTIMONY ADDRESS WITH REGARD TO THE TESTIMONY OF BURLINGTON WITNESS PAUL ROSASCO ?

A. My rebuttal testimony addresses his conclusions with regard to the source of contamination at the Hampton 4M site and Burlington's success or lack thereof, in remediating this site.

Q. DO YOU AGREE WITH MR. ROSASCO'S OPINIONS CONCERNING TWO SEPARATE SOURCES OF CONTAMINATION AT THIS SITE?

A. No, certainly not with regard to free product contamination at this site. The evidence shows that there are significant source(s) or release point(s) of free product contamination upgradient of PNM's former operations and downgradient

from Burlington's operations. Further, as there is a "clean" upgradient well above Burlington's potential sources on the wellpad, the data show that the free product originated from Burlington's operations on the southern portion of the wellpad, and did not come from a source somewhere upgradient of Burlington's operations.

Q. WHAT DO YOU UNDERSTAND AS THE BASIS FOR MR. ROSASCO'S OPINION THAT PNM'S FORMER PIT IS A SOURCE OF GROUNDWATER CONTAMINATION?

A. Mr. Rosasco states on page 4, lines 14 to 16 of his testimony that alleged "[h]igh levels of hydrocarbon contamination" beneath PNM's former pit extending continuously throughout the soil base of each impoundment down to the saturated zone" as one basis for his conclusion. However, contrary to this testimony, we do not have evidence of continuous levels of high levels of hydrocarbon contamination from the bottom of PNM's former pit to the water table. And given the way in which Burlington conducted its soil removal efforts between November 1998 and February 1999, they were unable to take representative soil samples from PNM's former pit bottom down to the groundwater surface to refute the data collected from previous soil borings directly beneath PNM's former pit. These borings show the absence of continuous high levels of contamination. In analyzing these data, we see relatively high levels of contamination in the area that has been identified as the bottom of PNM's former pit. The levels then decrease in the soil column beneath the pit until the water saturated zone is reached. Contrary to Mr. Rosasco's testimony, these data indicate that the free product did not come from the pit. The contamination in soils beneath the bottom

of the excavation in the vicinity of PNM's former pit came from the "bottom up" as the amount of free product floating on the water table increased and as groundwater levels fluctuated due to seasonal changes. In fact, data from the testing of the soil borings performed conducted by Burlington indicate that PNM's pit could have been closed based upon benzene and BTEX levels without need for further investigation or remediation under OCD guidelines for pit closure. If PNM's former pit was the source of free product contamination at this site, we would not see a reading this low in the soils directly beneath PNM's former pit.

as per testimony 8/26/99

Q. IS THERE ANOTHER BASIS FOR MR. ROSASCO'S OPINION THAT PNM'S FORMER PIT IS A SOURCE FOR FREE PRODUCT CONTAMINATION?

A. At page 4, lines 16 through 19 of his testimony, he notes that the greatest accumulation of free product is beneath PNM's former pit. As we have gone over at length before, this proves nothing with regard to groundwater contamination. The groundwater gradient at the site is undisputed -- the water under the site flows from the area of Burlington's operations to the area of PNM's former pit. The free product contamination is an LNAPL that moves with the groundwater. The majority of the free product originated upgradient from PNM's former pit and was present under PNM's former pit because of groundwater flow and subsurface features, not because it originated from PNM's former pit.

Q. DO YOU AGREE WITH MR. ROSASCO'S STATEMENT AT PAGE 6, LINES 17 TO 20 THAT BURLINGTON'S RECENT REMEDIATION EFFORTS WERE A REASONABLE AND A COST EFFECTIVE

000973

METHOD OF ADDRESSING CONTAMINATION REMAINING AT THE SITE?

A. No. Burlington's remediation techniques were highly invasive and not environmentally sensitive. In the process, Burlington removed an expensive and effective monitoring well net work and a functioning free product recovery system. Mr. Rosasco does not address how much Burlington's remediation efforts costs or how much free product Burlington removed, so the basis for his conclusion on the cost effectiveness of the operation is very questionable. More significantly, as discussed above, Burlington's efforts were not successful and substantial contamination remains in place at the site as evidenced by increasing benzene concentrations in MW-12 and MW-13. Specifically, Burlington did very little to address the upgradient sources or release points of the contamination in the area of its own operations. As PNM has asserted all along, unless these primary upgradient source or sources are addressed, remediation in the area of PNM's former pit will be ineffective.

Q. WHAT ISSUES DO YOU HAVE CONCERNING OCD WITNESS WILLIAM OLSON'S TESTIMONY?

A. My concerns regarding OCD Witness Olson's testimony deal with OCD's designation of responsible persons at the site and general conditions under a dehydration pit.

Q. CONCERNING OCD WITNESS OLSON'S TESTIMONY, DO YOU AGREE WITH HIS STATEMENT ON PAGE 7, LINES 2 THROUGH 5 THAT THE AVAILABLE DATA SHOWED THAT MEASURABLE

AMOUNTS OF FREE PHASE PRODUCTS ON THE GROUNDWATER WERE ONLY IN THE VICINITY OF THE DEHYDRATION PIT OPERATED BY PNM?

A. No. Burlington's report on their actions conducted at the Hampton 4M submitted to the OCD on July 30, 1997 included data indicating that NAPL was found on top of the groundwater in TPW-2. The report includes the boring log for TPW-2 which indicates that 0.39 feet of free phase product was detected shortly after drilling. Four days later, the boring log indicates the presence of 2.48 feet of free phase product in TPW-2. Therefore, free product was measurable in the test hole. TPW-2 was located upgradient of PNM's dehydrator units but was removed after only a few days; the well was never completed nor allowed to equilibrate. Therefore, OCD did have knowledge of measurable free product upgradient of PNM's former activities prior to making the designation of responsibility on August 27, 1997. The "line in the sand" drawn by Mr. Olson while on site with PNM representatives was between PNM's former dehydration units and the location of Burlington's test holes. This surface designation or "allocation" refuted any argument that free product could have traveled upgradient from PNM's former operation.

Q. **OCD WITNESS OLSON STATED ON PAGE 7, LINE 17, THAT HE HAS ENCOUNTERED THICKNESSES OF FREE PRODUCT CONTAMINATION IN GROUNDWATER UNDER DEHYDRATION PITS AT THIRTEEN SEPARATE SITES FROM A "SHEEN TO**

APPROXIMATELY THREE FEET OF FREE-PHASE PRODUCT." DO YOU HAVE CONCERNS WITH THIS STATEMENT?

A. Yes. PNM, in excavating over 1100 pits, has also encountered a visible sheen at several groundwater sites. However, in most instances, these sites have not evolved into sites with free product contamination. A hydrocarbon sheen in itself does not represent fresh source or free product and may result from lingering hydrocarbons. Unless and until the contaminant concentrations are known within the groundwater and a historical record is established, a sheen on the groundwater surface cannot be interpreted as free product. In most instances, once the source has been removed, the sheen disappears as natural attenuation occurs.

Q. OCD WITNESS OLSON FURTHER TESTIFIES THAT THE OCD HAS ENCOUNTERED ONE SITE WITH THREE FEET OF PRODUCT ON THE GROUNDWATER AND NO UPGRADIENT SOURCE OTHER THAN THE DEHYDRATION PIT. DO YOU HAVE QUESTIONS REGARDING THIS TESTIMONY?

A. Yes. PNM questions why a dehydration unit would be installed on (presumably) a well head site without the presence of a separation unit for the removal of gas condensate. The situation described by Mr. Olson would suggest that the dehydrator at his unspecified site was actually performing the function of both a dehydrator and separator. While we recognized that this situation may occur, PNM has not encountered this type of arrangement in the 1,100 pits we have addressed over the last four years. Thus, we do not feel this site can be compared

with the Hampton 4M. The configuration at the Hampton 4M is not unique in terms of equipment and tankage on site.

Q. WITH REGARD TO OCD WITNESS OLSON'S TESTIMONY ON PAGE 8, LINE18 THROUGH LINE 22, DO YOU AGREE WITH MR. OLSON'S STATEMENT THAT DEHYDRATION PITS CONTAIN FREE PHASE PRODUCTS AND PARAFFINS?

A. Yes. However, the fact that dehydration pits contain free phase product and paraffins is not an indication that such fluids have traveled to groundwater beneath a site and/or created the magnitude of free phase product contamination on the underlying aquifer that we now see at the Hampton 4M. As PNM Witness Rodney Heath testified, PNM contends that there may have been small amounts of free product passing through the dehydration unit but not of a sufficient volume to account for the thousands of gallons of free product estimated to be in groundwater at the site.

Q. MS. GANNON, HAVE THE OPINIONS YOU HAVE GIVEN IN THIS CASE BEEN BASED UPON YOUR EDUCATION, TRAINING AND EXPERIENCE IN OIL FIELD AND ENVIRONMENTAL SCIENCE RELATED MATTERS?

A. Yes.

Q. AND HAVE YOUR OPINIONS BEEN BASED ON A REASONABLE SCIENTIFIC AND ENGINEERING CERTAINTY?

A Yes.

Q. DOES THIS CONCLUDE YOUR REBUTTAL TESTIMONY?

000982

A. Yes, it does.

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

IN THE MATTER OF THE HEARING CALLED
BY THE OIL CONSERVATION COMMISSION
FOR THE PURPOSE OF CONSIDERING:

APPLICATION OF PUBLIC SERVICE COMPANY OF NEW MEXICO FOR *DE NOVO* HEARING ON ORDER NO. R-11134 ISSUED BY THE NEW MEXICO OIL CONSERVATION DIVISION IN

CASE NO. 12,033

AFFIDAVIT

STATE OF NEW MEXICO)
)SS.
COUNTY OF BERNALILLO)

I, Maureen D. Gannon, upon being first duly sworn according to law, under oath, depose and state: I am Manager of Pit Media Program for Public Service Company of New Mexico, and that I have read the foregoing Rebuttal Testimony. I further affirmatively state that I know the contents thereof and that they are true and correct to the best of my knowledge and belief.

SIGNED this 29 day of July, 1999.

Maureen Gannon
MAUREEN D. GANNON

SUBSCRIBED AND SWORN to before me this 29th day of July, 1999.

Dolores Moreno
Notary Public

[My Commission Expires: 9.28.99]

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000983

BEFORE THE

NEW MEXICO ENERGY, MINERALS AND NATURAL RESOURCES

OIL CONSERVATION COMMISSION

IN THE MATTER OF THE APPLICATION OF
PUBLIC SERVICE COMPANY OF NEW MEXICO
FOR REVIEW OF OIL CONSERVATION DIVISION
DIRECTIVE DATED MARCH 13, 1998
DIRECTING APPLICANT TO PERFORM
ADDITIONAL REMEDIATION FOR
HYDROCARBON CONTAMINATION,
SAN JUAN BASIN, NEW MEXICO CASE NO. 12033

REBUTTAL TESTIMONY OF

RODNEY THOMAS HEATH

SUBMITTED ON BEHALF OF

PUBLIC SERVICE COMPANY OF NEW MEXICO

APPLICANT

JULY 30, 1999

000984

OCC CASE NO. 12033
REBUTTAL TESTIMONY OF
RODNEY THOMAS HEATH

Q. PLEASE STATE YOUR NAME AND PLACE OF EMPLOYMENT FOR THE RECORD?

A. Rodney Thomas Heath. I'm the president of Petro Energy, Incorporated, P.O. Box 701, Farmington, New Mexico.

Q. HAVE YOU PREVIOUSLY PROVIDED TESTIMONY IN THIS PROCEEDING?

A. Yes. I provided pre-filed expert testimony on behalf of Public Service Company of New Mexico ("PNM") concerning the history of gas production surface equipment in the San Juan Basin and concerning the operational aspects of the surface equipment at the Hampton 4M well.

Q. CAN YOU PLEASE TELL US THE PURPOSE OF YOUR REBUTTAL TESTIMONY?

A. The purpose of my rebuttal testimony is to respond to certain issues raised by Burlington Witness James E. Rhodes and Oil Conservation Division ("OCD") Witness William C. Olson

Q. WHAT ARE THE ASPECTS OF THE TESTIMONY OF BURLINGTON WITNESS RHODES THAT YOU ADDRESS IN YOUR REBUTTAL TESTIMONY?

A. I will point out certain inconsistencies in Mr. Rhodes' testimony and expand upon certain operational and ownership aspects of oil field equipment operations that Mr. Rhodes excluded from his testimony.

000985

Q. WHAT INCONSISTENCIES DID YOU NOTE IN BURLINGTON WITENSS RHODES' TESTIMONY?

A. The inconsistencies are actually very significant. At page 3, lines 14 to 16 of the direct testimony of Burlington Witness Rhodes, he correctly points out that the former PNM dehydrator "is equipped with a mechanical device that will shut in the well when there are certain volumes of liquids in the gas stream coming into it." This is absolutely true. However, Burlington Witness Rhodes then goes on to testify at page 3, line 21 to page 4 line 2 that "this sensing element when properly functioning is very capable of handling and dumping the entire liquid production of the well and never send a signal to shut in the well." This second statement is completely inconsistent with the first quoted statement and is simply incorrect.

Q. IN WHAT WAY IS THIS SECOND STATEMENT INCORRECT?

A. Contrary to the testimony of Burlington Witness Rhodes, a ***properly functioning*** sensing element on the small separator associated with this dehydrator would shut in the well, even with only relatively small amounts of product hitting the sensing element. A properly operating sensing element would never handle the total amount of liquids produced by the Hampton 4M without shutting in the well.

Q. WHAT IS YOUR UNDERSTANDING ABOUT HOW THE FORMER PNM DEHYDRATORS WERE OPERATING AT THE HAMPTON 4M?

A. As discussed in my direct testimony, I personally spoke with some of the former PNM and current Williams Field Services operators responsible for dehydrator

operations at the Hampton 4M site. From their statements, we know that on occasion, the Hampton 4M was shut in by the dehydrator. This suggests that the sensing element was working properly. One operator described the Hampton 4M dehydrators as one of the best units he had on the ground. Again, this suggests that the dehydrators were working as designed. Therefore, the dehydrators would not tolerate large volumes of hydrocarbon fluids without shutting in the well

Q. IF THE ENTIRE HYDROCARBON LIQUIDS PRODUCTION OF THE HAMPTON 4M WELL WENT TO THE FORMER PNM DEHYDRATORS, WOULD YOU EXPECT ANY OPERATIONAL PROBLEMS?

A. Absolutely. As I previously testified, the dehydrators were in no way intended to separate large amounts of hydrocarbon liquids from the gas. They are intended only to remove moisture from the gas. If you had large volumes of hydrocarbon liquids coming through to the dehydrators, you would see operational problems with the sensing element separators such as paraffin build-up in the mist extractors. You would also probably have problems with frozen dump lines in the winter months because the water and hydrocarbons are removed from the sensing element separator through a common dump line. There is no evidence of dump line freezes or paraffin build-up at this equipment, and there is no evidence that large volumes of liquid hydrocarbons were discharged from this dehydrator.

000987

Q. HOW IS IT THAT LARGE VOLUMES OF LIQUIDS OR FREE PRODUCT WOULD EVEN GET TO PNM'S FORMER DEHYDRATORS?

A. The only way possible that you would get large volumes of liquids to PNM's former dehydrators is if Burlington allowed the large volumes to flow through to PNM's former dehydrators from Burlington's equipment. Burlington's combination production units (separators) are, among other things, designed and intended to remove in excess of 99 percent of all liquids from the gas. The only way you are going to get large volumes of liquids to PNM's former equipment is if there is either an operational deficiency or malfunction in Burlington's combination production units.

Q. WOULD PNM HAVE CONTROL OVER THE OPERATION OF BURLINGTON'S COMBINATION PRODUCTION?

A. No. Burlington and its predecessors would have sole control over and responsibility for operation of this equipment.

Q. AT PAGE 4, LINES 2 THROUGH 3, BURLINGTON WITNESS RHODES STATES THAT HE OBSERVED NO RESTRICTION IN THE OPERATION OF THE DUMP VALVE. IS THIS CONSISTENT WITH WHAT YOU OBSERVED AT THE HAMPTON 4M WELL ?

A. No, it is not. Burlington Witness Rhodes indicates that he was at the Hampton 4M well site in May of 1999. I was out at the site on August 12, 1998. When I observed the sensing element, there was an adjustable screw on the diaphragm

spring of the dump valve that restricted the dump valve stem travel. This limited the amount of liquids that could pass through the dump valve on the sensing element separator before the sensing element would shut in the well. If Burlington Witness Rhodes is correct in his observations, then there has been a subsequent modification to this unit. I would also point out that if the restriction has been removed, then this is ***not*** a properly functioning sensing element separator. I note that PNM has not owned or operated this unit since June 30, 1995 when certain gas gathering assets were sold to Williams.

Q ON PAGE 4 LINE 7 TO PAGE 5 LINE 5, BURLINGTON WITNESS RHODES DESCRIBES FOUR DIFFERENT WAYS THAT OIL COULD HAVE BEEN "LOST" AT THE HAMPTON 4M WELL SITE. DO YOU AGREE WITH THE FOUR DIFFERENT THEORIES OF LOST PRODUCTION DESCRIBED BY BURLINGTON WITNESS RHODES?

A. I agree that all four theories are possible means of losing liquids production. I don't agree with all of his conclusions relating to the four theories.

Q. PLEASE TELL US THOSE CONCLUSIONS ON THESE PAGES WITH WHICH YOU DISAGREE.

A. First, I don't agree that blowing the well to the atmosphere is necessarily the least likely of the four theories as stated on page 4, line 9 of the direct testimony of Burlington Witness Rhodes. This assertion is unsupported as Mr. Rhodes does not state why he believes this is the least likely manner of losing production.

From what I know about the operational and production history of the Hampton 4M well, it is possible that there could have been instances where they blew the well to the atmosphere. As I note in my direct testimony, there is a significant anomaly in the gas/oil ratio for the Hampton 4M well. The anomaly suggests loss of a significant amount of oil production. As I also note in my direct testimony, one way that this oil production might have been lost is if the well were blown to the atmosphere.

Q. IF A WELL IS BLOWN TO THE ATMOSHPERE, WHAT HAPPENS TO THE PRODUCTION FROM THE WELL?

A. The gas and some liquids are lost to the atmosphere and unless you have some means of collecting the liquids, they are usually blown to a pit. Historically, it was common practice to blow wells to unlined pits.

Q. WOULD PNM BE THE ENTITY RESPONSIBLE FOR BLOWING GAS TO THE ATMOSPHERE?

A. No. That is something that the producer would do. In this case, the producer would be Burlington or its predecessors.

Q. DO YOU AGREE WITH BURLINGTON WITNESS RHODES THAT LEAKS FROM STORAGE TANKS AT THIS SITE IS A POSSIBLE CAUSE FOR LOST PRODUCTION?

A. Yes I do. As PNM Witness Valda Terauds notes, Burlington managed all of the liquid hydrocarbon tankage at this site. In order to rule out tank leaks as the

source for the product in the groundwater, a suitable investigation of all current and former tank locations would have to be performed. From what we know about the history of this site, PNM never had any tankage at the site that could have leaked. Therefore, the investigation into leaking tanks at the site would have to focus on Burlington's operations.

Q. WHY ARE LIQUIDS CAPTURED AND STORED IN TANKS IN THE FIRST PLACE?

A. Well as I stated in my direct testimony, the free product has value and the producer, such as Burlington, has to report the production for royalty purposes and wants to sell that product.

Q. WHERE IS LIQUID PRODUCTION MEASURED SO THAT IT CAN BE REPORTED FOR THE PURPOSE OF ROYALTIES?

A. Liquid production is measured by gauging the liquid levels in the free product storage tanks.

Q. WHO IS RESPONSIBLE FOR MEASURING LIQUIDS PRODUCED IN THESE TANKS?

A. Burlington owns the liquid hydrocarbon storage tanks at the Hampton 4M well site. Burlington operators would be responsible for measuring liquids produced and stored in these tanks.

Q. COULD LOST PRODUCTION BE ATTRIBUTABLE TO LEAKING STORAGE TANKS?

A. Yes. If liquid product is pumped to leaking storage tanks, but leaks to the subsurface, the liquid levels may not change over time suggesting that hydrocarbons were not produced when in fact they were lost at the storage tank.

Q. ARE YOU AWARE WHETHER OR NOT THE ABOVE GROUND STORAGE TANKS AT THE HAMPTON 4M SITE WERE REMOVED OR REPLACED DURING THE PRODUCTION HISTORY OF THE WELL?

A. I am not sure how many times the above ground storage tanks were moved, replaced, or removed. I have been informed that prior to commingling, there were two above ground product storage tanks, a 300 bbl tank for Mesa Verde product and a 210 bbl tank for Dakota product. These two tanks were situated east of the combination production unit and were likely removed just prior to commingling. I do not know whether or not leaks in the tanks were discovered when the tanks were removed from the site. After commingling occurred in 1998, a single 210 bbl tank was used to hold hydrocarbons produced from both the Dakota and Mesa Verde formations. This tank is situated west of the combination production unit, and not at Burlington's former tank battery.

Q. IF THE PRIMARY FOCUS IS THE PRODUCTION OF NATURAL GAS, WOULD THE PRODUCER NECESSARILY NOTICE THAT LIQUID HYDROCARBON VOLUMES HAD DECREASED?

A. A diligent operator should notice a significant change in liquid hydrocarbon production. The loss of fluid production could mean that the overall well

production may be declining, which was not the case at the Hampton 4M. It could also denote that the tanks were leaking and required replacement.

Q. IF THE PRODUCER OWNS THE LIQUID HYDROCARBON PRODUCTS IN THE TANKS, WHY DOESN'T THE PRODUCER OWN THE PRODUCT IF IT IS DISCHARGED TO THE GROUND?

A. Unless there is some contractual provision to the contrary, the producer owns the product whether it is in tanks or in the ground or groundwater.

Q. WOULD THAT BE TRUE IN THE CASE OF LIQUID PRODUCTS DISCHARGED TO A PIT THROUGH A DEHYDRATOR?

A. Yes. The purchaser, PNM in this case, is only buying gas and not the liquids. The liquids belong to the producer, Burlington. PNM doesn't own those liquids.

Q. DO YOU AGREE THAT A MALFUNCTION OF THE PRODUCTION UNIT IS ALSO A POSSIBLE MEANS OF LOST PRODUCTION?

A. Yes. Again, however, this is not something that PNM would have any control over. If there was a malfunction of the production unit, this would be the responsibility of Burlington and not PNM.

Q. THE FOURTH AND FINAL THEORY OF BURLINGTON WITNESS RHODES ON HOW PRODUCTION COULD BE LOST IS IF THE LIQUID DUMP ON THE SEPARATOR AT THE PURCHASER'S DEHYDRATOR DISCHARGED LIQUIDS, INCLUDING FREE PHASE

HYDROCARBONS, INTO AN UNLINED PIT. DO YOU AGREE WITH THIS THEORY?"

A. Not in the case of the Hampton 4M well. PNM's former dehydrators were simply not designed to handle the volumes of liquids necessary to cause the type or amount of free phase contamination found at this site. In addition, as noted above, there is no evidence to suggest that during the period of time PNM operated the dehydrators at this site that they were not functioning properly. It is highly improbable that the apparent volumes of free product underlying the site could have come through PNM's former dehydrators and related dehydration pit. Again, if substantial volumes of liquids reached PNM's dehydrator, it could only be due to an operational error on the part of Burlington or malfunction in Burlington's equipment in the first place.

Q. DO YOU AGREE WITH THE CONCLUSION OF BURLINGTON WITNESS RHODES AT PAGE 5, LINES 12 THOUGH 13 THAT "PNM'S DEHYDRATOR, WHEN OPERATING EFFICIENTLY, COULD HAVE PERMITTED THE DISCHARGE OF SUBSTANTIAL VOLUMES OF LIQUID HYDROCARBONS INTO THE GROUND?"

A. No. The conclusion doesn't make sense. If the dehydrator is "operating efficiently," the sensing element is going to shut in the well if anything more than a very modest amount of liquids hits the unit. From all we know about how the dehydrators were operating at the time PNM operated them, they were performing

their function, i.e. "operating efficiently." This would preclude the release of "substantial" amount of free product into PNM's former pit.

Q. YOU ALSO INDICATED THAT YOU ARE PROVIDING REBUTTAL TESTIMONY CONCERNING CERTAIN TESTIMONY FROM OCD WITNESS OLSON. CAN YOU TELL US THE PART OF HIS TESTIMONY YOU WISH TO REBUT?

A. Yes. I believe that OCD Witness Olson has either misunderstood or taken my prior testimony out of context. At page 11, lines 20 to 24, OCD Witness Olson states that I testified at the prior hearing in this matter that "even if the dehydrator was working at 99% maximum efficiency, approximately 200 gallons/year of free phase products would be discharged from the dehydrator to the lined pit over the lifetime of the well."

Q. WHAT PARTS OF THIS STATEMENT DO YOU DISPUTE?

A. There are several parts of this statement that I dispute. First, when I was talking about efficiency rates in terms of the removal of liquids from gas, I was not taking about *dehydrators,* as stated by Mr. Olson. I was specifically addressing combination production units also commonly called "separators." Mr. Olson is referring to the wrong piece of equipment.

Second, I did not refer to the 99 percent efficiency rate as the "maximum efficiency" rate as stated by Mr. Olson. I believe my testimony was clear that this

figure was a ***minimum*** acceptable efficiency rate and that the actual rate would be much closer to 100 percent removal of liquids.

Third, I did not say that 200 gallons per year of free product "would" be discharged from the dehydrator to the unlined pit over the lifetime of the well. At the hearing we were talking about estimates and PNM Witness Terauds presented testimony and an exhibit with the maximum estimated amount of product that may have been discharged to PNM's pit. Ms. Terauds again has presented testimony (Direct Testimony of PNM Witness Terauds at page 20, lines 4 through 9) and an exhibit (PNM Exhibit 58) in this proceeding on this issue. The 200 gallon figure adhered to by OCD Witness Olson does not take into account the "flash off" of product to the atmosphere as I described in my direct testimony. The actual estimate of the amount of liquids that could have been discharged to the pit is less than 100 gallons per year.

Q. DO YOU HAVE ANY SPECIAL KNOWLEDGE OF THE DESIGN AND PROPER OPERATING CHARACTERISTICS OF THE COMBINATION PRODUCTION UNITS AND THE DEHYDRATOR USED AT THIS SITE?

A. Yes I do. As I mentioned in my direct testimony, I designed both of these pieces of equipment.

Q. GIVEN THE ABOVE FACT, DO YOU CONCLUDE THAT PNM CAUSED THE RELEASE OF FREE PRODUCT TO THE GROUNDWATER AT THIS SITE?

A. Under the circumstances in this case, I do not believe that this is a likely scenario. To the contrary, it appears that the free product groundwater contamination most likely originated from a point or points other than PNM's former dehydration pit.

Q. MR HEATH, HAVE THE OPINIONS YOU HAVE GIVEN IN THIS CASE BEEN BASED UPON YOUR EDUCATION, TRAINING AND EXPERIENCE IN OIL FIELD RELATED MATTERS?

A. Yes.

Q. AND HAVE YOUR OPINIONS BEEN BASED ON A REASONABLE ENGINEERING CERTAINTY?

A Yes.

Q. DOES THIS CONCLUDE YOUR REBUTTAL TESTIMONY?

A. Yes it does.

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

IN THE MATTER OF THE HEARING CALLED
BY THE OIL CONSERVATION COMMISSION
FOR THE PURPOSE OF CONSIDERING:

APPLICATION OF PUBLIC SERVICE COMPANY OF NEW MEXICO FOR *DE NOVO* HEARING ON ORDER NO. R-11134 ISSUED BY THE NEW MEXICO OIL CONSERVATION DIVISION IN

CASE NO. 12,033

AFFIDAVIT

STATE OF NEW MEXICO)
SAN JUAN)SS.
COUNTY OF BERNALILLO)

I, Rodney Thomas Heath, upon being first duly sworn according to law, under oath, depose and state: That I am President of Petro Energy, Inc., and that I have read the foregoing Rebuttal Testimony. I further affirmatively state that I know the contents thereof and that they are true and correct to the best of my knowledge and belief.

SIGNED this 28TH day of July, 1999.

Rodney Thomas Heath
RODNEY THOMAS HEATH

SUBSCRIBED AND SWORN to before me this 28TH day of July, 1999.

(Seal, if any)

Dawonna M. Heaston
Notary Public

[My Commission Expires: 07-21-2001]

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000998

BEFORE THE

NEW MEXICO ENERGY, MINERALS AND NATURAL RESOURCES

OIL CONSERVATION COMMISSION

IN THE MATTER OF THE APPLICATION OF
PUBLIC SERVICE COMPANY OF NEW MEXICO
FOR REVIEW OF OIL CONSERVATION DIVISION
DIRECTIVE DATED MARCH 13, 1998
DIRECTING APPLICANT TO PERFORM
ADDITIONAL REMEDIATION FOR
HYDROCARBON CONTAMINATION,
SAN JUAN BASIN, NEW MEXICO CASE NO. 12033

REBUTTAL TESTIMONY OF

MARK J. SIKELIANOS

SUBMITTED ON BEHALF OF

PUBLIC SERVICE COMPANY OF NEW MEXICO

APPLICANT

JULY 30, 1999

000999

OCC CASE NO. 12033
REBUTTAL TESTIMONY OF
MARK J. SIKELIANOS

Q. CAN YOU PLEASE STATE YOUR NAME AND YOUR PLACE OF EMPLOYMENT?

A. My name is Mark J. Sikelianos and I am employed by Public Service Company of New Mexico ("PNM"), in its Environmental Services Department.

Q. HAVE YOU PREVIOUSLY SUBMITTED DIRECT TESTIMONY IN THIS PROCEEDING?

A. Yes I have.

Q. CAN YOU PLEASE TELL THE COMMISSION THE PURPOSE OF YOUR REBUTTAL TESTIMONY?

A. The purpose of my rebuttal testimony is to address certain assertions made by Burlington Witness Louis Edward Hasely concerning Burlington's remediation efforts during the November 1998 to February 1999 time frame. I would also like to address the factual basis of statements provided by Burlington Witness Paul Rosasco regarding the origin of hydrocarbon contamination and the conclusions drawn from Burlington's remediation efforts.

Q. ON PAGE 16, LINES 13 AND 14, BURLINGTON WITNESS HASELY INDICATES THAT BURLINGTON EXCAVATED THE APPARENT SOURCE MATERIAL AT THE HAMPTON 4M SITE DURING THE WINTER OF 1998-1999. DO YOU AGREE WITH THIS TESTIMONY?

A. No I do not. As more fully described in the testimony of PNM Witnesses Gannon and Terauds, the results from sampling performed following Burlington's remediation work indicate that their remediation efforts have not been effective. The source of continuing inflow of free product identified within holding ponds

east of the Burlington excavation was never investigated. Free phase product continues to seep in from the eastern wall to the south and east upgradient of PNM's former dehydrator pit. In addition, Burlington has largely ignored the area of its own operations which are an upgradient source material for the free product contamination under this site.

Q. WERE YOU PRESENT DURING BURLINGTON'S REMEDIATION ACTIVITIES?

A. As indicated in my direct testimony in this case, I was present during much of the initial activities underway immediately prior to the OCD hearing in November 1998 and I observed Burlington's remediation and monitoring practices at this time. I was also present from time to time during the remaining course of the remediation activities spanning from December 1998, through February 1999.

Q. HOW WOULD YOU DESCRIBE BURLINGTON'S REMEDIATION PRACTICES AT THE HAMPTON 4M SITE?

A. There did not appear to be a remediation plan other than excavating PNM's former pit area. Burlington's remediation practices can only be described as extremely invasive and largely incomplete. It was basically a wholesale excavation of the soils in PNM's former unlined pit. Operations at the Hampton 4M production well had to be suspended for a time. Remediation was also halted due to the large volumes of soil and staging issues that arose limiting site access. In addition, Burlington's work destroyed PNM's monitoring well network and free product recovery system.

Q. WHEN YOU SAY THE WORK WAS INCOMPLETE, WHAT DO YOU MEAN?

A. Burlington's remediation effort was incomplete and ineffective at achieving the aim of remediating remaining source areas at the site. Burlington concentrated its efforts primarily in the area of PNM's former pit and did not place the same focus on excavating to the groundwater table and below in the area of its own operations. Burlington's activities in the area of its former and current operations were much less extensive. In the area of PNM's operations, Burlington's excavation went to groundwater. However, in the area of its own operations, Burlington did not go to groundwater. The only time Burlington went to groundwater on its portion of the well pad was the rather limited excavation performed in December 1997, as depicted in PNM Exhibit 66.

Second, I witnessed the presence of free product in the excavation made by Burlington in November 1998. Burlington did pump out and remove some of this free product with water during the course of its remediation efforts. However, not all of the free product was removed. As I understand it, (through verbal communication with Johnny Ellis of Burlington) only one barrel of free product was removed from groundwater during the entire process. Some free product was still in the open excavation when Burlington covered up the water and product in the excavation with clean fill. PNM Exhibit 54 shows a picture of free product on the groundwater in the Burlington excavation. Therefore, Burlington left free product in the groundwater and the remediation was incomplete in this respect as well.

Q. DID YOU SEE WHERE THE FREE PRODUCT WAS COMING FROM IN BURLINGTON'S OPEN EXCAVATION INSTALLED IN NOVEMBER 1998?

A. Yes. The free product was coming from the southeast side of the excavation, as shown in PNM Exhibit 66. This is up and cross gradient of the area of PNM's former pit. This shows that the free product did not originate from PNM's former pit. Mr. Hasely confirms this fact at Page 19, lines 2 through 3 of his testimony, where he indicates that only the cell on the eastern side of Burlington's excavation had free product floating on the water.

Q. DID YOU OBSERVE HOW BURLINGTON WAS DOCUMENTING ITS REMEDIATION EFFORTS DURING THE EXCAVATION?

A. Yes. There really was not much that was done in the way of documentation. First, Burlington did not take any care to segregate contaminated soils from clean soils. The soils were simply mixed together so that the clean soils then became contaminated. The total volume of soils from Burlington's 1998-99 remediation efforts are not a representative indicator of the total amount of contamination in the vicinity of PNM's former pit. The March 1999 Phillips Report (PNM Exhibit 60) does not give any indication of the amount of original contaminated soils that were removed from the site. Burlington's failure to segregate the soils also greatly increased the amount of soil that had to be handled and landfarmed.

Burlington also destroyed most of the landmarks which could provide elevation levels at the site. Burlington's attempts to survey in elevations were performed with a sight level and a rod. The results provided elevation data that was within

one or two feet of accuracy at best. Lateral measurement such as X and Y coordinates were not collected. As a result, Burlington can only provide best guesses about the depths and locations at which samples were taken at the site. There did not appear to be any plan or method in distinguishing what the criteria was for establishing clean soil and the documentation to support this.

These significant omissions in data collection call into question Burlington's conclusions about the success of its remediation efforts and its assertions concerning the absence of contamination.

Q. HOW ADEQUATE IS THE PHILIPS SERVICES REPORT DATED MARCH 3, 1999 WHICH IS ATTACHED AS BURLINGTON EXHIBIT 28?

A. It is not very adequate at all. The report is very limited and it is very hard to draw any conclusions from the data provided. The documentation provides a table and a site map (of no scale) of the heated headspace readings taken with a PID. The data were basically documenting random readings throughout the site. There did not appear to be any method in removing the contaminated soils nor documentation that soil clean up had been attained. I already discussed the lack of survey information in my direct testimony. This means that the sampling map included in the report is an estimate only and brings into question the validity of sample locations. The report also excludes the actual lab sample results. You can't verify the accuracy of the results mentioned in the report. Another open issue is how much free product was removed by Burlington at the site. There is

absolutely no documentation provided to demonstrate how much free product has been removed from the groundwater.

Q. AT PAGE 19 LINE 18 TO PAGE 20 LINE 3, BURLINGTON WITNESS HASELY INDICATES THAT BURLINGTON EXCAVATED FROM THE AREA OF PNM'S FORMER PIT TOWARD THE AREA THE PIT IT EXCAVATED IN DECEMBER 1997. HE GOES ON TO STATE THAT THE IMPACTED SOILS ENDED NEAR MW-4. DO YOU BELIEVE THAT BURLINGTON HAS ADEQUATELY ESTABLISHED THIS?

A. No. There really isn't sufficient documentation to establish this. In addition, there were some very high PID readings according to Burlington's own March 3, 1999 report prepared by Philips. Burlington Exhibit 28 provides only an incomplete map of the locations of its soil samples (PNM Exhibit 60 provides the complete map). We can see that sample no. 76 showed a reading of 2,999 ppm and sample no. 79 showed a reading of 2,999 ppm. These results are above the limitations of the PID and are extremely hot. It is also not apparent if the soil was removed, whether or not lab samples were taken and documentation that clean soil had been attained. These sample locations are in the area of MW-4, taken at a depth that would be very close to groundwater in the saturated zone and show high readings in the soils. I do not believe that there is any correlation to the sample numbers associated with PID readings and the determination that clean up was achieved. These results are inconclusive and contradict Burlington Witness Hasely's assertions.

Q. ON PAGE 14, LINES 3 THROUGH 4, BURLINGTON WITNESS HASELY DISCUSSES THE INSTALLATION OF MW-11 AND STATES THAT PNM DID NOT PARTICIPATE IN THE INSTALLATION OTHER THAN TO SEND A WITNESS TO MONITOR THE WORK. IS THIS TRUE?

A. While PNM did not pay for the installation of MW-11, I was on site to monitor the installation of the well. In the course of drilling the well, Burlington went to 50 feet and was going to cease drilling,. It was only as a result of my insistence, after consulting with PNM Witness Valda Terauds, that Burlington continued with the drilling to groundwater. Had I not been present and called Burlington on this matter, they may have stopped drilling and would not likely have completed a monitoring well. Burlington Witness Paul Rosasco, was not on site to provide recommendations.

Q. HOW WOULD YOU CHARACTERIZE BURLINGTON'S APPROACH TO ITS REMEDIATION ACTIVITIES IN TERMS OF THE AREAS OF THE WELL PAD SELECTED BY BURLINGTON FOR REMEDIATION?

A. As noted above, Burlington concentrated its efforts in the area of PNM's former operations. Burlington has largely ignored stripping soil in the area of its own operations upgradient from PNM's former pit, despite documented groundwater and soil contamination in the area of their operations. It seems as if Burlington is intentionally avoiding work in its own area so to avoid demonstrating that it is has released free product contamination in the area.

Q. WHAT ISSUES DOES YOUR REBUTTAL TESTIMONY ADDRESS WITH REGARD TO THE TESTIMONY OF BURLINGTON WITNESS PAUL ROSASCO ?

A. My rebuttal testimony addresses his conclusions with regard to the source of contamination at the Hampton 4M site and Burlington's success or lack thereof in remediating this site.

Q. WHAT DO YOU UNDERSTAND AS THE BASIS FOR MR. ROSASCO'S OPINION THAT PNM'S FORMER PIT IS A SOURCE OF GROUNDWATER CONTAMINATION?

A. Mr. Rosasco states on page 6, lines 1 to 5 of his testimony that hydrocarbons released to the PNM impoundment migrated down through the soil column reaching the underlying water table resulting in contamination of the saturated zone soil, accumulations of free product and dissolved phase groundwater contamination. He does not support this statement with any facts, data or observations. I was also on site during the remediation of PNM's former pit and I did not observe anything that would lead me to believe that this is true. On the contrary, I observed moderately contaminated soils from 12 feet to what was noted as 25 feet. This is documented in Philip's report, PNM Exhibit 60. The data show that the soil was moderately contaminated in the vadose zone directly below PNM's former pit, and that in fact the highly contaminated soils do not appear until the 25 foot interval in the saturated zone. This leads me to believe that the contamination originated from a source upgradient and migrated downgradient along the water table within the saturated zone beneath PNM's

former pit. PNM witness Maureen Gannon also provides testimony on soil borings (SB-2 in particular) that support this same conclusion.

Q. DO YOU AGREE WITH MR. ROSASCO'S STATEMENT AT PAGE 6, LINES 17 TO 20 THAT BURLINGTON'S RECENT REMEDIATION EFFORTS WERE A REASONABLE AND A COST EFFECTIVE METHOD OF ADDRESSING CONTAMINATION REMAINING AT THE SITE?

A. No. Burlington's remediation techniques were highly invasive and not environmentally sensitive. There was nothing methodical about the remediation process. Had the remediation plan been well thought out, Burlington would have initiated cleanup on the southern, upgradient side of the well pad and worked downhill or downgradient, thus avoiding recontamination issues. The most unreasonable aspect was that cleanup was attempted at the base of the well pad, while contamination continues to come from above on the southeastern edge of the well pad. There were some contaminated soils removed and as I have said before approximately one barrel of product removed in the entire process. However, it is very likely that clean soil backfilled within the saturated zone on the northern and lower edge of the well pad will have to be removed again thus duplicating effort and costs associated with this. Excavation of contaminated soils without regard as to the source of the free product does not appear to be very comprehensive, especially when it is evident that a continuing source is migrating from above. The soils could not be segregated and so the volume of contaminated soil was greatly increased. All soils had to be treated as contaminated. This does

not appear to be cost effective. Burlington removed an expensive and effective monitoring well network and a functioning free product recovery system. Burlington could have allowed this system to continue operating. PNM's recovery system had proven success of 1050 gallons of free product removed and there was no apparent reason to destroy this. Efforts to characterize and determine the source of free product on the southern side of the well pad would have been more effective.

Mr. Rosasco states on page 7 lines 20 and 21 that no free product has been observed in the area where extensive free product accumulations were observed prior to the remediation activities. PNM Exhibit 54 shows that product continues to accumulate in the water even as the backfill is being performed. Mr. Rosasco also cites groundwater monitoring data that he believes are indicative of a successful remediation. The data I have observed, both physical and analytical, would support a contrary conclusion. Monitor wells MW-9 and MW-12 have shown a dramatic increase in benzene concentrations, with MW-12 showing a very distinguished product sheen. PNM witness Valda Terauds provides detailed testimony supporting these findings.

Q. HAVE YOUR OPINIONS BEEN BASED UPON YOUR EDUCATION, EXPERIENCE AND TRAINING WITH RESPECT TO GROUNDWATER INVESTIGATION AND REMEDIATION?

A. Yes they have.

Q. ARE YOUR OPINIONS BASED ON A REASONABLE SCIENTIFIC PROBABILITY?

A. Yes.

Q. DOES THIS CONCLUDE YOUR TESTIMONY?

A. Yes, it does.

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

IN THE MATTER OF THE HEARING CALLED BY THE OIL CONSERVATION COMMISSION FOR THE PURPOSE OF CONSIDERING:

APPLICATION OF PUBLIC SERVICE COMPANY OF NEW MEXICO FOR *DE NOVO* HEARING ON ORDER NO. R-11134 ISSUED BY THE NEW MEXICO OIL CONSERVATION DIVISION IN

CASE NO. 12,033

AFFIDAVIT

STATE OF NEW MEXICO)
)**SS.**
COUNTY OF BERNALILLO)

I, Mark J. Sikelianos, upon being first duly sworn according to law, under oath, depose and state: I am Senior Technician in the Environmental Department for Public Service Company of New Mexico, and that I have read the foregoing Rebuttal Testimony, including exhibits. I further affirmatively state that I know the contents thereof and that they are true and correct to the best of my knowledge and belief.

SIGNED this 29th day of July, 1999.

MARK J. SIKELIANOS

SUBSCRIBED AND SWORN to before me this 29th day of July, 1999.

Notary Public

[My Commission Expires: 9-28-99]

001012

BEFORE THE

NEW MEXICO ENERGY, MINERALS AND NATURAL RESOURCES

OIL CONSERVATION COMMISSION

IN THE MATTER OF THE APPLICATION OF
PUBLIC SERVICE COMPANY OF NEW MEXICO
FOR REVIEW OF OIL CONSERVATION DIVISION
DIRECTIVE DATED MARCH 13, 1998
DIRECTING APPLICANT TO PERFORM
ADDITIONAL REMEDIATION FOR
HYDROCARBON CONTAMINATION,
SAN JUAN BASIN, NEW MEXICO CASE NO. 12033

REBUTTAL TESTIMONY OF

VALDA I. TERAUDS

SUBMITTED ON BEHALF OF

PUBLIC SERVICE COMPANY OF NEW MEXICO

APPLICANT

JULY 29, 1999

001012

CASE NO. 12033
REBUTTAL TESTIMONY OF
VALDA I. TERAUDS

Q. CAN YOU PLEASE STATE YOUR NAME, BUSINESS ADDRESS, AND QUALIFICATIONS AS A WITNESS IN THIS PROCEEDING?

A. My name is Valda I. Terauds and I am employed by Mission Research Corporation ("MRC") at 5001 Indian School N.E., Albuquerque, New Mexico. I am a Senior Scientist – Hydrologist, and have extensive experience in the assessment and remediation of sites contaminated by hydrocarbons, as established in my direct testimony, and in being accepted as a witness in the prior OCD hearing on this matter.

Q. HAVE YOU SUBMITTED DIRECT TESTIMONY IN THIS PROCEEDING?

A. Yes.

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?

A. The purpose of my testimony is to: 1) evaluate the factual basis of statements and conclusions regarding origins, distribution, extent, and success of remediation of hydrocarbons at the Hampton 4M site introduced under the direct testimony of Burlington witnesses Paul Rosasco and Louis Edward Haseley, and OCD witness William Olson; and 2) to demonstrate that certain opinions and conclusions presented by these witnesses are not supported by site-specific data obtained at the Hampton 4M site.

Q. ON PAGE 3 OF HIS TESTIMONY, MR. ROSASCO LISTS THE DOCUMENTS HE HAS REVIEWED IN PREPARING HIS TESTIMONY?

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WHAT HAVE YOU DONE IN PREPARING YOUR TESTIMONY FOR THE HAMPTON 4M SITE?

A. In addition to merely reviewing the documents listed by Mr. Rosasco, I have also prepared interpretations combining the site-specific data in order to better understand site conditions. I have personally prepared the cross-sections, groundwater contour and product maps, the calculations for how much product could have been contributed through PNM's dehydrator, and many of the other PNM exhibits relating to the occurrence and distribution of contaminants at this site. These interpretations are founded on site-specific boring logs, hard analytical data (not PID readings), and survey measurements. We have not seen any similar interpretations provided by Mr. Rosasco for the benefit of this hearing, nor to this point has Burlington challenged any of PNM's interpretations. To the contrary, Burlington uses many of PNM's interpretations as their own in reports submitted to OCD. Similarly, I have not seen any interpretations provided by OCD that contradict those prepared by PNM for this hearing. Again, in the absence of a conflicting opinion, one must conclude that all parties are in agreement as to the basic interpretations relating to groundwater flow, the occurrence of contamination in the subsurface, and estimates of contaminant volumes released.

Q. DO YOU AGREE WITH THE BASIS OF MR. ROSASCO'S CONCLUSION ON PAGE 4 OF HIS TESTIMONY THAT PNM HAS

CONTRIBUTED TO FREE PRODUCT OCCURRENCE AT THE HAMPTON 4M SITE?

A. No, I do not. Mr. Rosasco does not establish a basis of support in site data for his conclusion. He merely states that "high levels of contamination" are present in soils beneath both impoundments extending continuously through the vertical column of soil down to the saturated zone. He does not provide any site-specific analytical sample data to substantiate his statement. That is because the site-specific data contradict Mr. Rosasco's conclusion. Mr. Rosasco has obviously not reviewed his prior testimony from the OCD Hearing where a soil boring, SB-2 (PNM Exhibit 15) drilled by Burlington through the center of PNM's former impoundment, yielded a soil sample collected at 15 feet that met OCD guidelines for clean closure for benzene and BTEX (PNM Exhibit 48). This soil sample is site-specific hard data that indicates soil contamination levels in the interval between the base of PNM's former pit and groundwater are low enough that PNM's former pit would not be considered an ongoing source of groundwater contamination for benzene and BTEX by OCD guidelines, let alone a source of free phase hydrocarbons to groundwater. Mr. Rosasco conceded this point under cross-examination at the prior OCD hearing. The presence of high accumulations of free product beneath PNM's former pit is the result of free product released by Burlington that covers much of the Hampton 4M well site, as measured at upgradient locations (MW-4, MW-8, MW-10, and TPW-2).

Burlington's free product release has migrated downgradient to locations underlying PNM's former pit in response to gravity and site geology.

Q. DO YOU HAVE RECENT EVIDENCE THAT PNM'S PIT IS NOT AN ONGOING SOURCE OF FREE PRODUCT CONTAMINATION AT THE HAMPTON 4M SITE?

A. Yes. Despite the complete removal of all soils extending into the water table beneath PNM's pit by Burlington, free product continues to move downgradient from Burlington sources, as indicated by increasing benzene concentrations and the recent arrival of hydrocarbon sheen in MW-12 (PNM Exhibit 67). MW-12 was installed after Burlington's excavation was completed. As MW-12 will continue to demonstrate, the mere presence of free product beneath the footprint of a former pit does not necessarily indicate the pit is a source of that free product.

Q. MR. ROSASCO WAS ASKED WHETHER BURLINGTON CONTAMINATION WOULD HAVE CONTAMINATED UNSATURATED SOILS BENEATH PNM'S FORMER PIT – HE REPLIED "ABSOLUTELY NOT". MR. ROSASCO WAS NOT ASKED A MORE IMPORTANAT QUESTION AS IT CONCERNS FREE PRODUCT – AND THAT IS WHETHER FREE PRODUCT ORIGINATING FROM BURLINGTON'S OPERATIONS COULD HAVE CONTAMINATED SATURATED SOILS BENEATH THE FORMER PNM PIT?

A. That is true. Free product originating from Burlington's upgradient operations has contaminated saturated soils near the groundwater table beneath PNM's

former pit. Based on the magnitude of free product handled by Burlington at this site (248,000 gallons), the 22,000 gallons of tankage onsite, and the presence of a laterally extensive free product plume estimated at 7,000 to 13,000 gallons, Burlington's free product has blanketed most of the water table beneath the Hampton 4M site, including the portion of the well pad underlying PNM's former pit. The maximum amount of free product that could possibly have come through the dehydrator via PNM's former pit is about 1,125 gallons over a 13-year period, with only a fraction of that volume having the potential to reach groundwater. PNM recovered 1,050 gallons of free product at this site until the time its recovery equipment was removed. Approximately 7,700 to 13,000 gallons of free phase hydrocarbons are estimated to reside in the subsurface. If you believe PNM was a source of free phase hydrocarbons to the groundwater, which I do not, PNM could only have contributed less than 10 percent of the free product plume present at this site. PNM should not bear the responsibility for remediating half of the dissolved phase contamination resulting from free phase hydrocarbons.

Q. **MR. ROSASCO IS ASKED WHETHER UPWARD MIGRATION OF CONTAMINATION IS POSSIBLE – DO YOU BELIEVE UPWARD MIGRATION CAN OCCUR?**

A. Mr. Rosasco answers "no". I disagree. Mr. Rosasco has obviously not considered groundwater fluctuation and the resulting hydrocarbon smear zone caused by the rise and fall of the groundwater table. A rising water table will push overlying free product upward into the vadose zone. A falling water table

will create an accompanying fall in the free phase hydrocarbon elevation, but soils smeared by the up and down passage of free product will remain saturated with free product. This hydrocarbon smear zone typically occurs near the water table as shown on PNM Exhibit 68. This is the very mechanism that has contributed to the significant band of hydrocarbon contamination near the water table underlying much of the site, as well as the location near PNM's former pit. Hydrocarbon smear zones occur around the water table, and can easily extend several feet above and below the water table, depending on the magnitude of groundwater fluctuations occurring from the time of original release through the present. The stained soils observed at an interval of 12 to 14 feet beneath PNM's former pit during excavation, are clearly the pit base, and are not attributed to underlying free product. Soils beneath the pit base and above the smear zone just above the water table were clean per NMOCD closure guidelines for benzene and BTEX, as established by visual inspection of soils during excavation and the sample from Burlington soil boring SB-2. Product-stained and hydrocarbon-saturated soils were encountered only near the water table, starting at approximately 20 feet, with average depth to groundwater at this location being approximately 21.5 feet. Free product released by Burlington has been subjected to the rise and fall of the water table, resulting in creation of a smear zone with hydrocarbon-stained soils in and around the water table.

Q. WHAT IS THE IMPORTANCE OF THE SMEAR ZONE RELATIVE TO EFFECTIVE SOURCE REMEDIATION?

A. A typical smear zone for free phase hydrocarbon releases to the subsurface is shown as PNM Exhibit 68. The free product smear zone contains much of the hydrocarbon mass released at a site. It is this smear zone that must be remedied if excavation is to be successful at removing hydrocarbon sources at this site. Burlington excavated this smear zone beneath PNM's pit. Burlington but did not excavate the smear zone in the vicinity of their own operations, thereby leaving significant free phase hydrocarbon sources in place.

Q. DID BURLINGTON EVER ALLUDE TO THE PRESENCE OF HYDROCARBONS IN THE GROUNDWATER, AND NOT IN THE OVERLYING SOIL COLUMN, BEING AN INDICATOR THAT UPGRADIENT SOURCES OF HYDROCARBONS WERE CONTRIBUTING CONTAMINATION IN THE VICINITY OF BURLINGTON'S PIT?

A. Yes, on Burlington Exhibit 7, Page 4, the first paragraph discusses how significant contamination present just above the water table, but not in the overlying soils, suggests that the subsurface flow of contaminants is the predominant means by which that location is contaminated. This contradicts Mr. Rosasco's opinion on whether upward migration of contamination is possible. Burlington further proposed to investigate this suspected hydrocarbon source upgradient of MW-4 by constructing a small pad upgradient of the Hampton 4M site in order to conduct a groundwater investigation. This groundwater investigation was presumably satisfied by PNM's installation of MW-1

upgradient of the well pad. Burlington further states that if they discover the influence of an upgradient hydrocarbon source, they will cease operations and consult with OCD about responsible parties. They also indicate that if no off-site source of hydrocarbons is discovered that Burlington will conduct further investigation in the area of Burlington's operations.

Q. DID BURLINGTON DISCOVER A HYDROCARBON SOURCE UPGRADIENT OF THEIR OPERATIONS?

A. No. Data from MW-1, the upgradient well to Burlington's operations installed and sampled by PNM, met drinking water standards. This indicates that the sources of hydrocarbons at this site originate on the Hampton 4M well pad beneath Burlington's former operations.

Q. IN PERFORMING ITS UPGRADIENT INVESTIGATION, DID PNM DISCOVER A HYDROCARBON SOURCE UPGRADIENT OF PNM'S FORMER OPERATIONS?

A. Yes. PNM also performed an upgradient investigation to explore whether upgradient sources were responsible for the free phase product beneath PNM's former pit. This investigation revealed the presence of measurable free product in at least 4 upgradient monitoring well locations located near and immediately downgradient of Burlington's former operations. Burlington found no such upgradient contributions in the vicinity of MW-1. Therefore, the sole source of free phase hydrocarbons at this site lies in the area of Burlington's operations.

Q. IS THE MOVEMENT OF HYDROCARBONS ALONG THE WATER TABLE POSTULATED BY BURLINGTON, THE SAME MECHANISM PROPOSED BY PNM TO ACCOUNT FOR THE PRESENCE OF FREE PHASE HYDROCARBONS BENEATH PNM'S PIT?

A. Yes. The presence of hydrocarbon contamination in the smear zone along the water table without significant overlying soil contamination indicates that free product has migrated along the water table from upgradient sources.

Q. DID PNM, AFTER IDENTIFYING AN UPGRADIENT SOURCE, CEASE OPERATIONS AND CONSULT WITH OCD ABOUT RESPONSIBLE PARTIES, FOLLOWING A COURSE OF ACTION SIMILAR TO THAT OUTLINED BY BURLINGTON?

A. Yes. PNM and OCD representatives met to discuss PNM's findings at the site with regard to the location and distribution of free product upgradient of PNM's former pit and the issue of responsible parties.

Q. WHAT WAS THE RESULT OF THESE DISCUSSIONS?

A. OCD representative Roger Anderson suggested PNM appeal the OCD directive, requiring PNM to pursue free phase hydrocarbon remediation, as a final order if PNM disagreed with OCD's allocation of responsibility.

Q. DID PNM APPEAL THIS OCD DIRECTIVE?

A. Yes.

Q. IS THIS THE REASON FOR THIS HEARING?

A. Yes.

Q. DOES OCD ALLOW SITES TO BE CLOSED IF A RESPONSIBLE PARTY CAN DEMONSTRATE THAT IT HAS CLEANED UP A SITE TO BACKGROUND LEVELS?

A. Yes. PNM's groundwater management plan, as approved by OCD, allows for closure once remediation has been completed to background levels.

Q. CAN BACKGROUND LEVELS BE DEFINED AS HYDROCARBON CONCENTRATIONS IN UPGRADIENT WELLS?

A. Yes. in PNM Exhibit 22, Page 3 – background hydrocarbon concentrations relative to PNM activities at this site were defined as free phase product measured in upgradient monitoring wells MW-8 and TPW-2 and high dissolved phase concentrations from MW-8. Monitoring wells MW-10 and MW-4 also revealed the presence of free phase product at additional locations upgradient to PNM's former pit subsequent to the submittal of this report to OCD in PNM Exhibit 26, page 2.

Q. DID PNM FILE FOR CLOSURE AT THIS SITE BASED ON BACKGROUND HYDROCARBON CONCENTRATIONS?

A. Yes. PNM's closure report submitted to OCD is presented as PNM Exhibit 29, dated November 12, 1998.

Q. HAS OCD RESPONDED TO PNM'S REQUEST FOR CLOSURE AT THE HAMPTON 4M SITE?

A. Not to my knowledge, and not to this date.

Q. MR. ROSASCO WAS ASKED WHETHER PNM'S FORMER PIT WAS A SOURCE OF CONTAMINATION. DO YOU AGREE WITH HIS RESPONSE?

A. Mr. Rosasco answered that PNM's former pit resulted in soil, free product, and dissolved phase contamination. I disagree with his conclusion about free product and associated dissolved phase contamination based on review of site-specific data and sampling results. However, PNM's former pit may have contributed residual, sorbed hydrocarbons in soil, vapor phase hydrocarbons, and relatively small quantities of dissolved phase hydrocarbons. PNM's former pit did not contribute nearly 5 feet of free phase product on top of the groundwater table. Burlington boring SB-2 sampled at 15 feet shows that soils beneath PNM's pit meet OCD closure guidelines for benzene and BTEX. Burlington has not provided any field evidence to the contrary in the form of analytical sample data (not PID readings) that show hydrocarbon-saturated soils were present between 15 and 20 feet beneath PNM's pit. The accumulations of free phase hydrocarbons beneath PNM's former pit are the result of Burlington free product releases migrating beneath and through the sands occurring beneath PNM's former pit. Despite the complete removal of any sources attributable to PNM, free product is continuing to migrate through the subsurface at this site. This is shown by recent data reported for MW-12, the former pit location well, installed after Burlington had completely removed the soil column between ground surface and several feet beneath the water table. If PNM was the source of free phase hydrocarbons, and

that source is now fully remedied, MW-12 should have remained clean, and/or shown downward concentration trends. Instead, benzene concentrations in MW-12 have increased five-fold and a free phase hydrocarbon sheen has been observed on top of the water sampled from this well, indicating the reappearance of measurable free product is not far behind (PNM Exhibit 67). The source of free product appearing in MW-12 is solely from release points upgradient to PNM's former pit and cannot be attributed to PNM's former pit, as all soils were removed from this location in the winter of 1998.

Q. HOW EFFECTIVE WERE REMEDIATION EFFORTS PERFORMED BY PNM IN THE VICINITY OF THEIR FORMER PIT?

A. PNM's remediation efforts removed the bulk of soils from the pit, leaving an approximate 1.5 to 2-foot thick band of soils at the very base of the pit. Not being a current owner/operator of the site, PNM had no authority to move operator equipment or destroy the well pad. Instead, PNM removed as much soil as was reasonable given physical site constraints, including soil instability near the edges of the well pad. As demonstrated by Burlington boring SB-2, and subsequent excavation activities, soils beneath the contaminated layer marking the base of the former PNM pit were clean per OCD guidelines. It was not until the water table was reached that free product and product-saturated soils were encountered. PNM removed the bulk of potential hydrocarbon source material attributable to its pit, with the exception of the 1.5 to 2-foot thick base of the pit. The base of the pit was not contributing hydrocarbon-saturated materials to the vadose zone

between the base of the pit and the water table, and therefore could only be a minor source of dissolved contamination. Any dissolved phase contamination contributed by the leaching of soils beneath PNM's former pit would naturally attenuate in groundwater, were it not for the overwhelming, ongoing contamination coming from free product released by Burlington. An example of hydrocarbon contamination associated with typical PNM dehydrator pit sites is shown on PNM Exhibit 69.

Q. DID PNM LEAVE CONTAMINATION IN PLACE FROM ABOUT 12 TO 14 FEET BELOW GRADE?

A. Yes, an approximately 1.5 to 2-foot thick layer of hydrocarbon-contaminated soils was encountered during Burlington's excavation and was identified as the base of PNM's former pit (PNM Exhibit 50). These soils were not saturated with hydrocarbon, but were visibly stained and soil concentration data were above OCD closure guidelines. Soils beneath this layer and above the water table met OCD guidelines for benzene and BTEX. These soils from 12 to 14 feet did not contribute to free phase hydrocarbon contamination at the Hampton 4M well site. All of these soils were removed during Burlington's excavations in 1998.

Q. DID PNM LEAVE CONTAMINATION IN PLACE FROM ABOUT 14 TO 20 FEET BELOW GRADE?

A. No. The soil sample from boring SB-2 demonstrated that soils were clean according to OCD guidelines for benzene and BTEX, despite PID readings over 2000 ppm. These soils were also removed by Burlington in 1998.

Q. HOW DO YOU RECONCILE THE APPARENT CONFLICT BETWEEN PID READINGS AND SOIL ANALYTICAL RESULTS. THE PID READING SUGGESTS CONTAMINATION, WHILE THE ANALYTICAL LABORATORY RESULT CONFIRMS RELATIVELY CLEAN SOIL IS PRESENT?

A. PID readings are not a reasonable indicator of soil hydrocarbon concentrations in areas overlying free product or other significant sources of high concentrations of organic vapors. PID readings provide a general measure of the presence of organic vapors as measured from a vapor sample of the headspace above a soil. The photoionization detector (PID) responds to a wide range of organic vapors ionized over the range of light emitted by the photodetector. A PID is not measuring specific hydrocarbons such as benzene, toluene, etc. For example, a PID is often field-tested to make sure that it is responding to organic vapors by exposing the wand to a magic marker. The PID responds to organics in the marker and shows either a numerical or analog reading, depending on the instrument used. PID readings typically overstate the amount of contamination present precisely because they are sensitive to a wide range of vapors. It is typical to find soil concentrations below standards when that contamination is quantified by an analytical laboratory for specific hydrocarbon constituents benzene, toleune, ethylbenzene, and xylenes, despite PID readings that often peg the meter. In many cases, high PID readings are caused by other sources of hydrocarbons that emit organic vapors, but do not contaminate the soil. Free product on the

water table is such a source. Vapors from free phase hydrocarbons can migrate upwards in the soil column, without significantly contaminating the soil itself, resulting in a high PID reading and a low analytical laboratory result. This is the case with the data obtained for SB-2. The soils beneath the base of PNM's former pit are not highly contaminated, despite the high PID reading. Visual observation of excavation activities by PNM witnesses Sikelianos and Gannon, as depicted in PNM Exhibit 51, also confirmed that native soils, without significant hydrocarbon discoloration, were encountered between 14 and 20 feet below grade.

Q. DID PNM LEAVE CONTAMINATION IN PLACE FROM ABOUT 20 FEET TO 27 FEET BELOW GRADE?

A. Not from its operations. Hydrocarbon contamination encountered at these depths was in the form of free phase hydrocarbons and hydrocarbon-saturated soils at the smear zone near the water table as shown on PNM Exhibits 52 and 53. This contamination was subsequently identified by PNM to be free phase hydrocarbon contamination encroaching beneath PNM's pit location caused by Burlington's upgradient releases. PNM conducted reasonable investigations and determined that this free phase hydrocarbon contamination was originating at significant distances upgradient of PNM's former pit (MW-4, MW-8, MW-10, and TPW-2), that it encompassed much of the Hampton 4M well site, and that it was not related to discharges from PNM's dehydrator. PNM is not in the habit of remediating contamination clearly caused by others. Instead, PNM notified OCD of their

findings, and elected to continue to recover free product recovery at MW-6 until further determination was made as to allocation of responsibility. These soils were removed by Burlington in 1998.

Q. WHAT PROOF IS THERE THAT BURLINGTON'S REMEDIATION EFFORTS WERE REASONABLE AND EFFECTIVE AT ADDRESSING REMAINING CONTAMINATION AT THE HAMPTON 4M WELL SITE, AS ASSERTED BY BURLINGTON WITNESS ROSASCO?

A. There is no proof that Burlington's remediation has been successful. Groundwater monitoring data, collected since Burlington's excavation activities were completed, demonstrate that ongoing sources of free phase and dissolved phase hydrocarbons are continuing to adversely impact water quality. If Burlington had successfully addressed contamination at this site, dissolved phase groundwater concentrations would be decreasing, there would be no increases in benzene, and there would be no reappearance of free product. Data from monitoring wells installed since the Burlington excavation show that dissolved phase groundwater concentrations are increasing (MW-9, MW-12, hydrocarbon seep, and MW5), benzene concentrations are increasing (MW-9. MW-12, hydrocarbon seep), and free product sheen is reappearing (MW-12). Therefore, source removal has not been successfully accomplished. This is largely due to the fact that Burlington did not excavate the hydrocarbon smear zone residing above and below the groundwater table in the areas of their own operations in order to

identify and remediate the release points contributing free phase hydrocarbons at this site.

Q. DID BURLINGTON'S RECENT EXCAVATION IN THE AREA OF PNM'S FORMER PIT RESULT IN ADVERSE IMPACTS TO GROUNDWATER?

A. Yes. Contrary to testimony by Mr. Rosasco, groundwater conditions at this site have not improved since Burlington's excavation. Burlington backfilled the excavation despite ongoing free phase hydrocarbon inflow into the excavation (PNM Exhibit 54), rather than tracing and excavating the sources of this free phase hydrocarbon inflow upgradient towards the area of Burlington's operations. The relative areas excavated to the water table and below are shown on PNM Exhibit 6. The areal extent of free phase hydrocarbon contamination is depicted on PNM Exhibit 57. At least half of the area impacted by free phase hydrocarbons, almost all of it located in the southern half of the well pad in the vicinity of Burlington's operations, has not been excavated to depths at and below the water table. Groundwater concentrations for monitoring wells associated with the Hampton 4M site, including most recent data collected in July 1999, are summarized in PNM Exhibit 67. Monitoring well MW-9, which was hovering near the 10 ppb groundwater standard for benzene prior to Burlington's excavation, has now increased ten-fold, to a concentration of 120 ppb, as illustrated in PNM Exhibit 70. Concentrations in MW-12, the new well near PNM's former pit installed after Burlington's excavation, increased from 790 to

4,500 ppb benzene in the two months since the well has been installed (as shown on PNM Exhibit 70), and hydrocarbon sheen has been observed on the water surface. Concentrations in MW-13, the replacement well near MW-4, are elevated at 2,100 ppb benzene and appear to be holding steady (PNM Exhibit 70). Concentrations at the hydrocarbon seep were below 10 ppb benzene before Burlington's excavation and were above groundwater standards at 40 ppb benzene in April 1999. Concentrations at the closest downgradient well MW-5 are also steady to increasing slightly since Burlington's excavation (PNM Exhibit 70). Groundwater quality has clearly worsened since the excavation, as indicated by water quality trends for most of the wells illustrated in PNM Exhibit 70. Based on the fact that hydrocarbon sheen has already been observed by staff while sampling MW-12 during the May and July 1999 sampling events, PNM expects measurable free product will reappear in this well.

Q. WHAT IS YOUR UNDERSTANDING OF THE BASIS FOR MR. ROSASCO'S ASSERTION THAT THE GROUNDWATER QUALITY IS IMPROVING?

A. The sole example for groundwater quality improvements cited by Mr. Rosasco is MW-7. Mr. Rosasco's assertion that this well shows improvements measuring effects of Burlington's excavation neglects the fact that this well is almost dry (less than 6 inches of standing water) due to a falling water table and is not presently yielding representative samples, as shown on PNM Exhibit 70. Second, assuming groundwater flows at the maximum estimated velocity of 500 feet per

year, MW-7 is located more than one (1) year's travel time away from the site. Mr. Rosasco is obviously taking analytical data at face value and is not evaluating data quality, nor is he placing data in the context of groundwater behavior at the site. Any groundwater quality trends at MW-7 could not reasonably be attributable to Burlington's excavation until some time after the year 2000.

Q. WITH REGARD TO MR. HASELEY'S TESTIMONY ON PAGES 8 AND 9, MR. HASELEY REFERS TO NINE OR TEN TEST HOLES EXCAVATED WITH THE CLAIM THAT NO HYDROCARBONS WERE DETECTED. CAN YOU FIND ANY FACTUAL BASIS FOR THIS CLAIM?

A. No, I cannot find any documentation by Burlington that these test holes were excavated, sampled, or otherwise tested. Mr. Haseley himself is unclear on the number of test holes excavated. There are no maps identifying test hole locations, dimensions, drilling or excavation methods used, PID readings obtained, or analytical sample results. Documentation submitted to OCD does not include supporting data for these test holes.

Q. ON PAGE 11, MR. HASELEY CLAIMS THAT BURLINGTON HAS BEEN RESPONSIVE TO OCD REQUESTS FOR ACTION AT THIS SITE. HAS BURLINGTON EVER INSTALLED THE SOURCE MONITORING WELL SPECIFICALLY REQUESTED BY OCD IN THE LOCATION OF TPW-7?

A. No. Burlington has never installed this source monitoring well at the location of TPW-7, which was requested by OCD in a letter to Burlington included as Burlington Exhibit 10. Burlington kept postponing the installation of this source monitoring well, as indicated in Burlington Exhibit 12, claiming that Burlington would proceed with source well installation after backfilling its excavation. The excavation is backfilled and there has yet to be a source monitoring well installed at the location of TPW-7. Burlington has not complied with OCD directives, as this well was requested by OCD in November 1997.

Q. ON PAGE 14 LINES 4 AND 5 OF MR. HASELEY'S TESTIMONY, MR. HASELEY STATES THAT PNM DID NOT PARTICIPATE IN THE INSTALLATION OF MW-11 OTHER THAN TO SEND A WITNESS TO MONITOR BURLINGTON'S WORK. DO YOU AGREE WITH THIS ASSESSMENT?

A. No. This is a misrepresentation of PNM's role in the successful completion of downgradient well MW-11. PNM did send a representative, PNM Witness Sikelianos, to observe the drilling and installation of this well. Mr. Sikelianos telephoned me from the site on the day that this well boring was drilled and stated that Burlington had reached a depth of 50 feet and was ready to abandon the well location as a dry hole because they had not yet reached groundwater. I asked Mr. Sikelianos whether Burlington had a hydrogeologist onsite to direct the installation and completion of this well. Mr. Sikelianos responded that Mr. Rosasco was not onsite, and there were no other hydrogeologists present onsite

representing Burlington that could make informed decisions concerning the completion of this well. Mr. Sikelianos indicated that Johnny Ellis was onsite on behalf of Burlington and that Mr. Ellis was the individual recommending that Burlington stop drilling. Messrs. Ed Haseley and Bruce Gantner of Burlington were also onsite. To my knowledge, neither Johnny Ellis, Ed Haseley nor Bruce Gantner are hydrogeologists. Mr. Sikelianos asked for my recommendations concerning well completion. I told Mr. Sikelianos that this well should be completed at least 10 feet deeper than the depth to water measured in the EB well in order to find groundwater. Mr. Sikelianos forwarded this recommendation to the Burlington representatives. Burlington proceeded with drilling, groundwater was encountered at 55 feet, and the well was completed to a total depth of 70 feet. PNM ensured the successful completion of this well by having an alert site representative onsite and a contract hydrologist familiar with the site. Burlington proceeded with the installation of this well based on PNM's recommendation. If PNM representatives had not been onsite, this location would likely have been abandoned by Burlington as a dry hole.

Q. WERE THE BORING LOGS AND WELL COMPLETION DIAGRAMS FOR WELL MW-11 SUBMITTED BY BURLINGTON TO NMOCD?

A. No, not to my knowledge. I have not found boring logs for MW-11 appended to any correspondence transmitted by Burlington to the OCD.

Q. HAS BURLINGTON OMITTED OTHER DATA IN ITS REPORTING TO OCD?

A. Yes. Burlington Exhibit 21 refers to two soil borings drilled on the Hampton 4M location. Burlington makes statements that the soil borings confirm substantial contamination in place in the area of PNM's operations and to a lesser extent near Burlington's pit area. It also claims that contamination associated with PNM operations is migrating upgradient as well as downgradient. However, there are no site-specific boring data for SB-1 or SB-2 provided with this correspondence to OCD to support these assertions. The only attachment to this report is a letter from Burlington Attorney Bill Carr. Burlington does not provide OCD with soil boring logs from borings SB-1 and SB-2. It does not provide OCD with the analytical data for soil samples obtained from SB-2, which demonstrate that soils beneath PNM's pit are clean relative to NMOCD closure guidelines for benzene and BTEX. Instead, Burlington misrepresents to OCD that data collected indicate soils beneath PNM's pit are heavily contaminated.

Q. HAS BURLINGTON SUBMITTED ANY WRITTEN REPORTS OF ITS EXCAVATION ACTIVITIES OF NOVEMBER 1998 THROUGH FEBRUARY 1999 TO OCD.

A. No, not to my knowledge. I have not found any transmittal correspondence from Burlington to the OCD for the March 1999 report by Philip Services Corporation regarding the excavation activities (Burlington Exhibit 28).

Q. ATTACHMENT B TO BURLINGTON EXHIBIT 28 SHOWS A PLAN VIEW OF EXCAVATED AREAS – WHERE DOES THE PREDOMINANT

EXCAVATION AND SAMPLING ACTIVITY OCCUR BASED ON THIS DRAWING?

A. The area of activity and sampling is shown to have occurred in two areas, the first area is centered around PNM's former pit location, indicated by the well symbols for MW-2 and MW-6. The second phase of excavation occurred primarily to the east, at locations cross-gradient and upgradient of PNM's former pit. This drawing does not show any activity occurring in the areas of Burlington's former operations on the southern half of the well pad. A complete version of this figure is included as PNM Exhibit 60. The complete drawing shows excavation and sampling activity between Burlington's former pit and the wellhead. No further excavation was performed in Burlington's areas of known subsurface contamination - specifically near TPW-5, TPW-6, and TPW-7. Contamination documented by soil and groundwater samples obtained at these locations from depths greater than 15 feet remains in place.

Q. ON PAGES 18 AND 19 OF HIS TESTIMONY, MR. HASELEY REFERS TO AN EASTERN CELL. WHAT IS THE LOCATION OF THIS CELL IN RELATION TO PNM'S FORMER PIT?

A. Based on field observations reported by PNM witness Sikelianos, this cell is located east of the footprint of PNM's former pit. The active free phase hydrocarbon inflow was coming from the southeast area of the excavation and accumulating in the eastern cell. The active inflow was occurring at a location upgradient and a significant distance away from the location of PNM's former pit.

Q. DID BURLINGTON TRACE THE ORIGINS OF HYDROCARBONS ACCUMULATING IN THIS CELL?

A. While Burlington did remove an estimated one barrel (55 gallons) of accumulated free product from this cell, Burlington also covered up an ongoing, active hydrocarbon inflow by backfilling this excavation. There is no documentation in the form of photographs, video, or site reports that verify Burlington excavated to the water table and below, in the vicinity of its own operations, in order to track the release points of this active free phase hydrocarbon inflow. Instead, Burlington backfilled this known, active source of free phase hydrocarbons without employing any other means of remediation such as a collection drain with a riser for collection, additives to stimulate bioremediation, or other active or passive remedies. In the absence of further actions, hydrocarbons will continue to move downgradient unabated, as is being demonstrated by the inflow and encroachment of increasing hydrocarbon contamination into MW-12. This is the same mechanism that created the accumulation of free product beneath PNM's former pit.

Q. ON PAGE 19 OF HIS TESTIMONY, MR. HASELEY REFERS TO THREE DIRECTIONS AS UNDERLYING AND DOWNGRADIENT OF PNM'S FORMER PIT – HOW CAN THIS OCCUR?

A. It is physically impossible for three directions to be downgradient. Gradient is defined as a line from point A to point B. Therefore, only two directions, i.e., north and west, if the gradient is towards the northwest, can be downgradient. All

other compass points are either cross-gradient or upgradient. Of the three directions cited by Mr. Haseley, only north and west are downgradient of PNM's former pit on the well pad. East is either cross-gradient or upgradient of PNM's former pit. As far as directions that underlie the site, PNM's former pit was a relatively small pit with dimensions of about 20 by 20 feet. The lower bench at the Site, remaining after Burlington's partial backfill of the excavation near PNM's former pit, was surveyed and is shown on PNM Exhibit 66. The dimensions of the excavated bench extend approximately 50 feet wide by 100 feet long. The excavated, benched areas occur only in the northern half of the well pad. Most of the benched area does not underlie PNM's former pit, but was extended significantly east and upgradient of PNM's former pit location. Significantly, this benched area does not extend northward to Burlington's operations, suggesting that significant excavation and soil removal of the scale undertaken at PNM's former pit location was not performed in areas underlying Burlington's equipment.

Q. ON PAGE 19 OF HIS TESTIMONY, MR. HASELEY REFERS TO SOIL REMOVAL IN THE NORTHEAST PART OF THE OLD BURLINGTON EXCAVATION OCCURRING UNTIL PID READINGS INDICATED CLEAN SOILS WERE ENCOUNTERED – IS THIS SUBSTANTIATED BY DATA PROVIDED IN THE PHILIP SERVICES REPORT (BURLINGTON EXHIBIT 28)?

A. No. Soil samples were not obtained by Philip Services for analytical testing. PID readings exceed 100 ppm for four of six samples obtained below 16 feet from the vicinity of Burlington's former pit: 17, 18 29, and 35 (Burlington Exhibit 28). Additionally, samples near MW-4 encountered high PID readings at reported depths of 16 to 17 feet (samples 76 and 79), yet no soil samples were collected to demonstrate whether soils meet NMOCD closure guidelines on the basis of analytical laboratory data. In the absence of analytical laboratory data, it is apparent that hydrocarbon-contaminated soils remain at depth in areas of Burlington's former operations.

Q. ON PAGE 20 OF HIS TESTIMONY, MR. HASELEY REFERS TO THE INSTALLATION OF A NEW MONITORING WELL MW-13. HAS THE SOURCE WELL NEAR TPW-7 REQUESTED BY OCD BEEN INSTALLED?

A. No, the source well near TPW-7 has yet to be installed, despite backfilling of the former Burlington pit excavation. MW-13 is a replacement well installed in the vicinity of MW-4 and is not a true source well as it is not centered near TPW-7 in the area of Burlington's former tanks and pit areas.

Q. MOVING TO TESTIMONY PROVIDED BY MR. OLSON OF THE OCD, ON PAGE 5 OF MR. OLSON'S TESTIMONY, HE IS ASKED WHETHER OCD DIVDED RESPONSIBILITY BETWEEN BURLINGTON AND PNM. HE RESPONDS "YES" – IS THIS AN ALLOCATION OF RESPONSIBILITY?

A. Yes. PNM responded to this allocation made by OCD as an inappropriate allocation based solely on physical location of equipment, and not site-specific data as to the origins, magnitudes of release, and impacts to the subsurface.

Q. ON PAGE 6 OF MR. OLSON'S TESTIMONY, MR. OLSON IS ASKED THE REASONS FOR DESIGNATION OF RESPONSIBLE PERSONS. DO YOU AGREE WITH HIS ASSERTION THAT THE PRESENCE OF MEASURABLE FREE PHASE HYDROCARBONS SHOULD AUTOMATICALLY PLACE RESPONSIBILITY FOR FREE PRODUCT REMEDIATION ON PNM?

A. No. The mere presence of mobile contaminants, such as free phase hydrocarbons should not automatically place the release point at equipment owned by the party overlying such contamination. PNM recognized the unusual characteristics of this site and brought those characteristics to the attention of OCD. Subsequent investigation revealed the presence of an upgradient, areally extensive free phase hydrocarbon plume that moves in response to gravity and geology. This free phase hydrocarbon plume is still present beneath the well pad. It has not been remediated by Burlington, and it will continue to encroach on the area beneath PNM's former pit location, despite the complete removal of all soils beneath that area. The encroachment by free phase hydrocarbons will be repeated, as shown by monitoring well MW-12. In view of the massive excavation performed in the location of PNM's former pit, PNM cannot possibly be responsible for the newly invading free phase hydrocarbons. This data supports PNM's contention that

PNM was not an original release point for free phase hydrocarbons, and that the free phase hydrocarbons are originating from and are continuing to be released from Burlington's operations located upgradient.

Q. HAS MR. OLSON PROVIDED ANY BASIS FOR DISTINGUISHING FREE PRODUCT AS CONTRIBUTED BY PNM FROM THAT CONTRIBUTED BY BURLINGTON ON PAGE 6 OR LATER IN HIS TESTIMONY ON PAGE 11?

A. No. Mr. Olson merely speaks to the presence and thickness of free phase hydrocarbons. He does not indicate that free phase hydrocarbons from speculated PNM sources are any different in chemical character from those released by Burlington. When you evaluate the areally extensive, continuous hydrocarbon plume at this site, it is clear that the larger foot print of hydrocarbons is associated with locations upgradient of PNM's former pit and are therefore clearly the result of Burlington's operations.

Q. IN THE ABSENCE OF A CHEMICAL DISTINCTION IN THE FREE PHASE HYDROCARBON ITSELF, IS IT MORE LIKELY THAN NOT THAT THE FREE PHASE HYDROCARBONS CAME FROM A SINGLE SOURCE AREA WHERE RELEASES CREATE AN AREALLY EXTENSIVE HYDROCARBON PLUME UNDERLYING THE WELL PAD?

A. Yes. The presence of a continuous free phase hydrocarbon plume has been confirmed by drilling and sampling performed subsequent to Mr. Olson's division

of responsibility at this site. There is no separation in the occurrence of free phase product beneath the well pad. All monitoring wells installed on the well pad between Burlington's operations and PNM's former pit location show the presence of free product. Upgradient wells indicate that most of the areal extent of free phase hydrocarbons occurs upgradient of PNM's former operations. (TPW-2, MW-10, MW-8, and MW-4) Soils beneath PNM's former pit merely provided a geologically favorable accumulation zone for this migrating, encroaching free product.

Q. WAS THIS INFORMATION REGARDING THE AREAL EXTENT OF FREE PHASE HYDROCARBONS PRESENTED TO THE OCD AND WHAT WAS THE OUTCOME OF THIS PRESENTATION?

A. Yes, it was. As testified in prior rebuttal testimony, meetings with Messrs. Roger Anderson and William Olson of the OCD and PNM Witnesses Toni Ristau, Maureen Gannon, Mark Sikelianos, and myself occurred in late March 1998, several weeks after the letter prompting this hearing was issued. PNM provided OCD with working cross-sections and plume maps depicting the data gathered by PNM. The interpretations offered by PNM at that time were not disputed by OCD. Instead, Mr. Anderson indicated that despite the data, OCD would not change its allocations as it did not want to get involved in disputes between owners and operators. As PNM was not a current operator, Mr. Anderson suggested that if PNM disagreed with OCD's allocation of responsibility, PNM

could appeal the March 1998 directive as a final order as a means of obtaining a more equitable allocation of remediation responsibility.

Q. ON PAGE 9, OF MR. OLSON'S TESTIMONY, HE STATES THAT PNM WAS DIRECTED TO DO ADDITIONAL WORK IN ORDER TO REMOVE SOURCES OF FREE PHASE PRODUCT CONTAMINATION IN THE SOIL. SHOULD THIS DIRECTIVE APPLY EQUALLY TO BURLINGTON AT THIS SITE?

A. Yes. Burlington has left documented subsurface hydrocarbon contamination in place at depths greater than 16 feet. The smear zone near and below the water table has not been excavated or remediated in the areas of Burlington's former operations. These free phase hydrocarbons are continuing to migrate downgradient, as evidenced by the recent arrival of free phase hydrocarbon sheen in MW-12, the well installed after complete removal of soils associated with PNM's former pit. Site-specific data indicate that sources remaining in the vicinity of Burlington's operations are continuing to contaminate the subsurface, and until they are removed, groundwater remediation will not be successful.

Q. ON PAGE 9, MR. OLSON ALSO STATES HIS BELIEF THAT WITH THE BULK OF SOIL CONTAMINATION REMOVED, DECREASES IN DISSOLVED-PHASE CONTAMINATION WOULD BEGIN TO OCCUR – ARE THEY IN FACT OCCURRING AS A RESULT OF BURLINGTON'S EXCAVATION IN THE VICINITY OF PNM'S FORMER PIT?

A. No. Instead, dissolved phase concentrations have increased in wells placed in the immediate location of Burlington's excavation as well as downgradient and cross-gradient monitoring wells. Again, this indicates upgradient sources of hydrocarbons remain and are still actively migrating to downgradient locations.

Q. BASED ON GROUNDWATER QUALITY DATA, CAN YOU CONCLUDE THAT BURLINGTON HAS REMOVED THE SOURCES OF CONTAMINATION AT THIS SITE?

A. No. Contaminant sources remain and are contributing to further degradation of groundwater quality.

Q. ON PAGE 10, MR. OLSON STATES THAT HE DOES NOT BELIEVE THAT FREE PRODUCT RECOVERY ALSO REMOVES THE SOURCES OF THAT PRODUCT IN SOIL. DO YOU AGREE WITH THIS STATEMENT?

A. Yes. Free product recovery removes the contaminant mass that is mobile. It does not address residual contamination that remains sorbed on the soil particles and is not capable of flowing into and being captured by a recovery well. However, the release points for free phase hydrocarbons at this site are located in the area of Burlington's operations. Unless you identify and remove the release points and the resulting free phase hydrocarbon smear zone, attempts at reasonable, cost-effective groundwater remediation will be unsuccessful. PNM had already established that PNM was not the release point for free phase hydrocarbons at this site. PNM brought this information to the OCD's attention, and has substantiated

its assertions that there is a large areally extensive free phase hydrocarbon plume originating near Burlington's operations. Therefore, PNM elected not to proceed with further remediation of contamination caused by Burlington. PNM contends that hydrocarbons remain beneath Burlington's operations. This contention is substantiated by data collected since Burlington's excavations have been completed in the area of PNM's former pit. Obviously, sources of free phase hydrocarbons remain despite the removal of soils beneath PNM's former pit. Therefore, Burlington should be called upon to fully excavate the area of its operations and remove the remaining free product in soils at and below the water table.

Q. ON PAGE 11, MR. OLSON STATES THAT, IF THE DEHYDRATOR WAS WORKING AT A SEPARATION EFFICIENCY OF 99%, ABOUT 200 GALLONS PER YEAR WOULD BE DISCHARGED FROM THE WELL INTO THE UNLINED DEHYDRATION PIT. DO YOU AGREE WITH THE ACCURACY OF HIS STATEMENT?

A. No. First, Mr. Olson mistakenly refers to the PNM dehydrator, when the better than 99% separation efficiency testified to by PNM Witness Heath is in reference to the combination production unit owned and operated by Burlington. The reference to a 200 gallon per year discharge from the dehydrator to the unlined pit is high and does not account for other mechanisms that would reduce the amount of hydrocarbons actually discharging to the pit.

Q. WOULD ALL 200 GALLONS OF FREE PHASE HYDROCARBONS, TESTIFIED TO BY MR. OLSON AS POSSIBLY PASSING THROUGH THE DEHYDRATOR, END UP AS FREE PHASE HYDROCARBONS FLOATING ON THE GROUNDWATER TABLE?

A. No. Soils have the capacity to absorb hydrocarbons, similar to a sponge holding liquids. This soil "sponge" can soak up a substantial volume of liquids before it becomes saturated. In this case, the "sponge" of soils beneath the PNM pit was not saturated with hydrocarbons, as indicated by soil samples from SB-2 that met NMOCD closure guidelines for benzene and BTEX. When taking into account the fact that hydrocarbon discharge through the dehydrator would not occur at once and that flashing would volatilize about 50% of product released, my estimates of hydrocarbons potentially reaching the surface of the dehydrator pit are less than 100 gallons per year. This translates to less than a 1/3 gallon per day poured into a pit underlain by a soil column that is 20 feet thick. This small hydrocarbon discharge would not noticeably fill up a dehydrator pit 20 by 20 feet in dimension, let alone infiltrate to the groundwater table and cause a 5-foot accumulation of free product. The free product on the water table beneath PNM's former pit came from other sources. The only other sources at this site are Burlington's operations.

Q. AGAIN, WORKING WITH THE 200 GALLONS OF FREE PHASE HYDROCARBONS ASSERTED BY MR. OLSON AS POSSIBLY

DISCHARGED PER YEAR TO THE PIT, HOW MUCH FREE PHASE HYDROCARBONS WOULD PNM HAVE RELEASED?

A. Using Mr. Olson's inflated estimate of 200 gallons of free phase hydrocarbons discharge to the PNM dehydrator pit per year, and an operating period of 13 years, PNM could have only contributed a maximum of 2,600 gallons to a free phase hydrocarbon plume conservatively estimated to range between 7,700 and 13,000 gallons. PNM recovered 1050 gallons of free phase hydrocarbons during its recovery efforts. This again speaks to the fact that a 50 percent share of responsibility is an unfair allocation. Even according to OCD's overstated estimates, PNM could have contributed only 20 to 34 percent of the volumes at the Site. This calculation also does not give PNM any credit for the 1050 gallons of free phase hydrocarbons already recovered. Therefore, even when using OCD's inflated estimates on quantities of hydrocarbons discharged via PNM's dehydrator, PNM should not be responsible for cleaning up 50% of hydrocarbon contamination at this site.

Q. ON PAGE 11 OF HIS TESTIMONY, MR. OLSON ALLUDES TO HEAVY CONTAMINATION OF SOILS BENEATH THE FORMER PNM PIT. DOES HE PROVIDE DATA TO SUPPORT THIS CONTENTION?

A. No. He does not cite specific sampling data to demonstrate that soils beneath PNM's former pit are heavily contaminated. He does not refer to specific analytical sample data collected at from locations beneath the former PNM pit in order to justify his claim. Site-specific data refute the characterization that soils

beneath PNM's former pit were heavily contaminated, especially considering the relatively clean analytical samples obtained from soil boring SB-2.

Q. ON PAGES 11 AND 12 OF HIS TESTIMONY, MR. OLSON ALSO STATES THAT THE MAJORITY OF FREE PHASE HYDROCARBONS ARE PRESENT BENEATH PNM'S FORMER PIT. IS THIS SIGNIFICANT WHEN DETERMINING SOURCES OF GROUNDWATER CONTAMINATION?

A. No. Both free phase hydrocarbons and groundwater move in the subsurface. With movement, you have encroachment on downgradient locations. It is dissolved phase groundwater encroachment onto private property that is causing OCD concern at this site. It is free phase hydrocarbon encroachment beneath PNM's former equipment location that is not being recognized as similarly responsible for the bulk of groundwater contamination at this site. The present-day location and accumulation of free phase hydrocarbons has little bearing on the original, historic release points of hydrocarbons because these contaminants move. The release points for free phase hydrocarbons reside within the area of Burlington's operations. These release points beneath Burlington's operations have not yet been identified or remedied, therefore groundwater contamination is continuing unabated at this site.

Q. ON PAGE 12 OF HIS TESTIMONY, MR. OLSON STATES THAT BOTH PNM AND BURLINGTON ARE RESPONSIBLE PARTIES AND THAT

BOTH HAVE RESPONSIBILITY FOR REMEDIATION, DO YOU AGREE WITH THIS ASSESSMENT.

A. No. PNM is responsible for the soil contamination contributed by its former pit. This contamination has been addressed. PNM has cleaned up its site relative to background concentrations. Background concentrations at this site are demonstrated to include free phase hydrocarbons originating from Burlington's operations. Burlington is responsible for its release of hydrocarbons to the soil and the resulting free phase and dissolved phase contamination of groundwater, and the migration of this contamination to other portions of the well pad as well as offsite impacts. Both parties should remediate the consequences of their respective releases. PNM has completed its remediation work. Burlington has not. I disagree with OCD's allocation that both PNM and Burlington are equally responsible for remediating groundwater at this site. Even using OCD's worst-case hydrocarbon release assumptions, PNM would be responsible for less than one third of the groundwater contamination at this site. A more accurate allocation for groundwater contamination is stated in my direct testimony, wherein PNM has no further responsibility for the investigation or remediation of free phase or associated dissolved phase contamination at this site.

Q. ARE THE OPINIONS IN YOUR TESTIMONY BASED UPON YOUR EDUCATION, TRAINING, AND EXPERIENCE IN THE ENVIRONMENTAL FIELD?

A. Yes.

Q. FURTHER, ARE THE OPINIONS IN YOUR TESTIMONY BASED UPON YOUR PERSONAL EXAMINATION OF SITE-SPECIFIC DATA AND YOUR INTERPRETATION OF SAMPLES AND MEASUREMENTS COLLECTED AT THE HAMPTON 4M SITE, MUCH OF WHICH IS REPRESENTED IN EXHIBITS PREPARED FOR THIS HEARING?

A. Yes. I have been evaluating data and interpreting conditions at this site since the hydrocarbon seep was first discovered in April 1997. Most of the technical exhibits relating to the occurrence and distribution of hydrocarbons in the subsurface are my interpretations. Neither Burlington nor OCD have provided any interpretive exhibits to the contrary as evidence at this hearing.

Q. ARE YOUR OPINIONS BASED UPON REASONABLE SCIENTIFIC CERTAINTY?

A. Yes.

Q. DOES THIS CONCLUDE YOUR TESTIMONY?

A. Yes.

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

IN THE MATTER OF THE HEARING CALLED
BY THE OIL CONSERVATION COMMISSION
FOR THE PURPOSE OF CONSIDERING:

APPLICATION OF PUBLIC SERVICE COMPANY OF NEW MEXICO FOR *DE NOVO* HEARING ON ORDER NO. R-11134 ISSUED BY THE NEW MEXICO OIL CONSERVATION DIVISION IN

CASE NO. 12,033

AFFIDAVIT

STATE OF NEW MEXICO)
)**SS.**
COUNTY OF BERNALILLO)

I, Valda I. Terauds, upon being first duly sworn according to law, under oath, depose and state: That I am Senior Scientist – Hydrologist of Mission Research Corporation, and that I have read the foregoing Rebuttal Testimony. I further affirmatively state that I know the contents thereof and that they are true and correct to the best of my knowledge and belief.

SIGNED this ___ day of July, 1999.

Valda I. Terauds
VALDA I. TERAUDS

SUBSCRIBED AND SWORN to before me this 28th day of July, 1999.

(Seal, if any)

Dolores Moreno
Notary Public

[My Commission Expires: 9.28.99]

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