ESCAFCA
Eastern Sandoval County Arroyo Flood Control Authority

P.O. Box 638
829 Camino Del Pueblo
Bernalillo, NM 87004
Tel: (505) 771-7110 ext. 7110
http://www.escafca.com

December 15, 2011

To: See distribution
Re: Pipeline Grant Report; Agreement DTPH56-10-G-PHPT03

Attached is the final report, in either hard copy or electronic form, as appropriate or prescribed. It is comprised of the following sections:

I. Executive Summary
II. Conclusions/Recommendations [Technical Memorandum]
III. History/background
IV. The Process
V. References
VI. Acknowledgements

If further information is needed, please contact Mike Castillo at mcastillo@escafca.com, and me at blairylar@hotmail.com or 505-249-1035.

Sincerely,

Larry A. Blair P.E.
ESCAFCA Consultant

Distribution:
USDOT Pipeline and Hazardous Materials Safety Administration-2 [electronically]
Enterprise Products-1
Kinder Morgan-1
NM Public Regulatory Commission-Pipeline Safety Bureau-1
Sandoval County-2
Placitas Library-2
Placitas Community Center-1
ESCAFCA-3
Wilson and Co. Inc-1

I. Pipeline Grant Report-Executive Summary

In 2007-2008, residents of Placitas, NM, requested that the safety of several pipelines in and crossing Las Huertas Creek be investigated, especially because some lines had been exposed during a 2006 storm event. They also requested that the Creek be kept as natural as possible.

In response, the Board of Directors of the Eastern Sandoval County Arroyo Flood Control Authority [ESCAFCA] commissioned an engineering study to determine how the creek would behave over a 30-year period of typical storm events, plus a 100-year event. This so-called "Prudent Line Study" predicted the vertical and lateral migration likely to occur.

Concern had been raised in other forums and documents, but this study, using an analytical approach, predicted that the pipelines could indeed be exposed by stormwater scour, thus increasing the danger of rupture or damage.

The Grant received from USDOT Pipeline and Hazardous Material Safety Administration [PHMSA] enabled work to continue, both to inform the public about the study results, and to continue further engineering analysis aimed at identifying specific concerns, and recommending possible solutions.

A major purpose of this entire study effort was to demonstrate that engineering analysis can, and should be used to predict scour and lateral migration when pipelines and watercourses are to occupy the same space.

This Report documents the entire process used for Las Huertas Creek. The final component, entitled "Technical Memorandum: Recommendations for Channel Stability Measures in Las Huertas Creek, Sandoval County, New Mexico", recommends the construction of four grade control structures, installation of bank protection in four locations, and monitoring of existing pipeline protection. This Technical Memorandum is Section II, Conclusions/Recommendations [next under].

Because Las Huertas Creek and Placitas are no longer in ESCAFCA jurisdiction, this report is provided to other government and regulatory agencies, to the affected pipeline companies, and to the community of Placitas, for whatever action is deemed appropriate.

Technical Memorandum: Recommendations for Channel Stability Measures in Las Huertas Creek, Sandoval County, New Mexico

December 8, 2011

1. INTRODUCTION AND BACKGROUND

In October 2010, Tetra Tech, Inc. completed a channel stability analysis and prudent line assessment for portions of Las Huertas Creek in Sandoval County, New Mexico (Tetra Tech, 2010) that was conducted for Wilson and Company, Inc. (Wilson). As part of this work, Tetra Tech provided recommendations for channel stabilization measures for the project reach, a number of which were developed to protect the buried pipelines in the portion of the project area between the Camino de Las Huertas culvert crossing and the eastern boundary of the Placitas Open Space. During the field reconnaissance for that study, a number of existing channel stabilization measures were identified, including articulated concrete mat bed and bank protection and gabion basket bank protection. While these items were used to estimate the location of the buried pipelines, no information was available to determine neither the exact location nor the burial depth of the pipelines; thus, that study recommended a more detailed field investigation with representatives from the pipeline companies (Enterprise and Kinder-Morgan) to determine the location and burial depth of the pipelines. This field investigation was subsequently carried out by representatives from Wilson, East Sandoval County Flood Control Authority (ESCAFCA), and Enterprise during August 2011. Information collected during the investigation was provided to Tetra Tech to develop updated recommendations for channel stabilization measures that may be necessary to protect the pipelines. This memorandum summarizes the findings from the field investigation and the updated recommendations for grade control and bank protection in the portion of the project area where the buried pipelines were identified.

2. FIELD INVESTIGATION SUMMARY

Four buried pipelines are located along the valley bottom of Las Huertas Creek from about 900 feet upstream (east) from the Camino de Las Huertas Culvert Crossing to near the eastern boundary of the Placitas Open Space in Subreaches 8 and 9 as defined in the previous study. The pipelines include an 8-inch refined petroleum product line installed by Enterprise in 1972, two 12-inch natural gas lines installed by Enterprise in 1980 and 1995, and a 30-inch CO2 line installed by Kinder Morgan in 1982. The field investigation was carried out by representatives from Wilson, ESCAFCA, and Enterprise to identify the specific location of the pipelines, the burial depth, and locations where existing bed and bank protection have been installed (**Figure 1**). The alignment of the pipelines was determined using an electronic locater, and the burial depth to the top of the Enterprise pipelines was measured at four specific locations, and estimated at one additional location (Figure 1).

3. UPDATED RECOMMENDATIONS

Because no additional bed-material data were collected for this updated study, and because the previously developed hydraulic model includes sufficient resolution to evaluate the hydraulic conditions in the vicinity of the buried pipelines that were identified during the August 2011 field investigation, the previously developed hydraulic models and associated sediment-continuity and equilibrium slope analyses were used in conjunction with the findings from the field investigation to update the recommendations for channel stability measures necessary to protect the pipelines. These recommendations include measures to insure the vertical stability of the channel (grade-control structures) and measures to protect against bank erosion and lateral migration (bank protection), as discussed in the following sections. **It should be noted that, because the depth of the pipelines is not known at a number of locations, a burial depth of 3 feet was assumed at these locations for this analysis, since that depth appears to be consistent with most of the measured burial depths. If additional information becomes available that indicates the assumed burial depth of 3 feet is larger than the actual burial depth, it may be necessary to re-evaluate the recommended stabilization measures.**

3.1. Location of Grade-control Structures

Four locations were identified where grade control may be necessary to protect the pipeline crossings. The identified grade control was primarily located downstream from areas where the ultimate equilibrium slope profile (i.e., the anticipated channel bed profile after channel incision) would be below the top of the pipelines, and could therefore threaten the stability of the pipelines. The existing bed protection (articulated concrete mats) and natural grade control, as identified during the 2010 and 2011 field investigations, was considered in the development of the recommendations. A profile of the existing channel bed, the field-identified or estimated top of pipeline that is buried beneath the channel bed, the existing bed protection, and the ultimate equilibrium slope profile with the recommended grade control is shown in **Figure 2**. A summary of the recommended grade-control structures is presented in **Table 1**, and are also shown on the aerial photograph in Figure 1. Downstream scour protection for the grade-control structures is discussed in the design considerations section, below.

The first recommended grade-control structure (GCS#1) is located at Station 85+00 about 700 feet downstream from Arroyo del Ojo del Orno. The Enterprise pipeline just upstream from this grade control structure is buried to a depth of 26 inches, and the dirt road crossing at this location could destabilize the channel bed. For these reasons, an approximately 2-foot grade-control structure is recommended, even though the equilibrium slope analysis indicates less than 1-foot of degradation is anticipated at this location.

GCS #2 is located at Station 98+50 at the downstream limit of the existing bed protection (articulated concrete mat) to protect the Kinder Morgan lines that run parallel to the channel beneath the channel bed and the Enterprise line that crosses the channel bed a short distance upstream. This grade control structure would also assist in preserving the stability of the existing articulated concrete mat along the channel bed and banks upstream from the structure, thereby eliminating the need for additional grade control through the matted reach. During the 2011 field investigation, the top of the Enterprise line crossing could not be located, but it was estimated to be buried to a depth of 6 feet near 100+00 (150 feet upstream from GCS #2).

Table 1. Summary of recommended grade-control structures in Subreaches 8 and 9.									
Grade-control Structure	Station (ft)	Crest Elev @ Existing Ground (ft)	Elev after Incision (ft)[1]	Predicted Drop Height (ft)	Estimated Plunge Scour (ft)	Recommended Drop Height (ft)	Top of Pipeline Elev (ft)	Existing Dist to Top of Pipeline (ft)	Dist to Top of Pipeline After Incision[1]
GCS #1[2]	85+00	5495.2	5494.5	0.7	2.5	2.0	5493.1	2.2	1.5
GCS #2[2,3]	98+50	5521.2	5518.8	2.4	7.0	3.0	5517.3	3.9	1.5
GCS #3[4]	105+70	5546.3	5540.2	6.1	6.5	6.1	NA	NA	NA
GCS #4[4,5]	120+50	5580.4	5574.0	6.3	4.3	-	NA	NA	NA

[1]Based on the equilibrium slope analysis in Tetra Tech, 2010.

[2]Riprap to be installed below crest to protect against plunge scour since estimated scour depth exceeds distance to pipeline.

[3]Based on estimated pipeline burial depth at Station 100+00.

[4]Recommended drop height assumes measures to protect against plunge scour will be installed.

[5]Not recommended unless existing culvert foundation depth is less than the 6.3 feet of predicted incision; no drop height recommended because foundation depth unknown.

Assuming this estimated burial depth is correct, this grade-control structure should have a total drop height of 3 feet to account for the 2.4 feet of downstream incision that is predicted by the equilibrium slope analysis. However, because the measured burial depths are much shallower at up- and downstream locations, the 6-foot burial depth at Station 100+00 could be over-estimated, so the depth to the top of the pipeline at GCS #2 could be less than the estimated depth of 3.9 feet. If this is determined to be the case, it may be necessary to adjust the height of the drop to be less than the distance to the top of the line but still sufficient to account for the 2.4 feet of predicted downstream incision.

The majority of the reach between GCS #2 and the existing 6-foot headcut at Station 98+50 is currently protected with articulated concrete mat, and this mat will be stabilized by GCS #2. It is therefore unlikely that significant incision will occur in this reach, provided that the mat is sufficiently keyed in to prevent undermining of the upstream limit of the mat (as discussed in the considerations for design section, below). While the existing headcut is composed of erosion-resistant Santa Fe Formation and appears to be relatively stable at the current time, disturbance of the formation during large floods could result in upstream migration of the headcut. To prevent this migration from reaching a point where it could threaten the pipeline crossings near Station 111+00, which have burial depths of as little as 3 feet, GCS#3 should be installed at this location. To reduce the amount of trenching that would be necessary for keying down, this structure could be located immediately downstream from the headcut at Station 105+70 with a crest elevation equal to the elevation of the existing headcut crest, provided that the void between the structure and existing crest is filled with soil cement. Because the anticipated incision along the reach between GCS #3 and the Camino de Las Huertas culverts is less than the measured or estimated burial depths of the pipelines in this reach, no additional grade control is recommended in this reach. However, if the estimated burial depths of 3 feet are determined to be too high, it may be necessary to install additional grade control in this reach.

The estimated incision at the downstream face of the Camino de Las Huertas culvert crossing (Station 120+70) is about 6.3 feet. While the key-down depth of the culvert foundation is unknown, if it is determined to be less than the predicted depth of incision, some form of grade control is recommended at Station 120+70 to protect the culverts. Because the key-down depth of the culvert foundation is not known, the details (type, drop height, etc.) of this grade control cannot be determined at this time. However, if the vertical distance to be protected is relatively small, some form of lateral trenchfill riprap may be a viable and less costly solution than a cement-based structure at this location. The low-elevation portion of the roadway grade to the south of the culvert crossing in the left overbank was apparently designed to be a sacrificial washout section. If this section were to fail during a large flood event, significant downcutting in the vicinity of upstream pipelines could occur. It is therefore recommended that this section of the roadway be replaced with a non-sacrificial grade that is equipped with a hardened spillway on the downstream (west) face of the embankment.

Although Tetra Tech did not conduct any analysis along Arroyo del Ojo del Orno, information collected during the 2011 field investigation indicated that active incision downstream from the Cedar Creek Road culvert crossing of this arroyo could threaten the Enterprise lines that cross the arroyo a short distance downstream from the road. Based on this observation, a grade control structure should be located a short distance downstream from the pipeline crossing to protect pipeline. However, the structure drop height and other structural details such as plunge pool scour protection will need to be determined at a later date, since the depth of the pipeline is not known and since estimates of the depth of incision are not available in this arroyo.

3.2. Location of Bank Protection

A number of locations were identified where the pipelines are buried in the channel banks and could be threatened by bank erosion or lateral migration. To protect the pipelines in these areas, riprap bank protection is recommended, as shown in Figure 1 and summarized in **Table 2**. The recommended bank protection on the left bank between Station 58+80 and Station 60+50 would protect both the structures on the top of this bank and the pipelines buried in this vicinity. The bank protection that was recommended in Tetra Tech (2010) on the right bank between Station 61+00 and Station 63+20 was intended to protect the residential buildings just north of the bank, and is still recommended even though it would not protect any pipelines. About 370 feet of bank protection is recommended to protect the pipeline buried in the left bank between Station 110+80 and Station 114+30. In addition to the bank protection recommended in Las Huertas Creek, about 370 feet of bank protection is also recommended on the left bank of Arroyo del Ojo del Orno near its mouth to protect the Enterprise line that is buried to the south of this tributary. In addition, if the burial depth of the Kinder Morgan line that runs parallel to the channel along the north bank between Station 82+00 and Station 92+70 is determined and the top-of-pipeline elevations are higher than the channel invert, bank protection may also be required on the right bank to prevent lateral migration that could endanger this line.

Table 2. Summary of recommended bank protection in Subreaches 8 and 9.

Downstream Station (ft)	Upstream Station (ft)	Length (ft)	Bank	Comment
58+80	62+80	360	Left	Protect residential structures and buried pipelines in active bank erosion reach.
61+00	63+20	230	Right	Protect residential structures in active bank erosion reach.
92+00	95+70	390	Left	Protect Enterprise line buried along outside of actively eroding reach of Arroyo del Ojo del Orno.
110+80	114+30	370	Left	Protect Enterprise line buried on outside of bend.

3.3. Design Considerations for Stabilization Measures

A number of items should be considered in the more detailed design of the grade-control structures and bank protection, as presented in the following sections. The scour estimates that were used to develop a number of these recommendations are based on guidelines presented in the SSCAFCA Sediment and Erosion Design Guide (Design Guide; MEI, 2008).

3.3.1. Grade Control Structures

The potential for plunge scour that typically occurs downstream from the crest of grade control structures is a primary consideration in the design of the structures. Preliminary estimates of the plunge scour were made using the Veronese equation (Equation 3.57 in the Design Guide) and the hydraulic conditions predicted by the Tetra Tech (2010) hydraulic model for the 100-year future development conditions peak flow. These estimates indicate the predicted plunge scour depths range from 2.5 feet at GCS #1 to about 7.0 feet at GCS #2. Because the estimated scour depths at GCS #1 and #2 exceed the pipeline burial depth after incision (Table 1), it will be necessary to install some form of scour protection in the plunge pool of these two structures. While a number of measures could be employed in the plunge pools, either riprap or articulated concrete mats will likely be the most effective considering the relatively shallow pipeline burial depths below the structures. The scour protection should extend for a distance of at least 1.5 times the crest with the downstream end matching the existing profile, and the downstream end should be toed-down to a depth that matches the equilibrium slope profile (**Figure 3**). The area excavated to install the protection should be backfilled to the existing grade after construction. The protection measures at GCS #1 and GCS #2 should be designed and installed in a manner that safeguards the pipelines that run parallel to the channel bed. No buried pipelines were identified at the upstream two structures (GCS #3 and GCS #4), so scour protection is not necessary at these two structures. However, because the estimated plunge scour depths are relatively large at these two locations (Table 1), the scour protection measures that are recommended for GCS #1 and GCS #2 could also be implemented at the upstream structures.

The recommended grade-control structure GCS#2 is located near the downstream limit of the existing bed protection, where the mat transitions from bed protection to bank protection. To insure that this structure protects the upstream mat in the bed as well as the downstream mat along the right bank, the existing mat should be "broken" at the structure crest. This would allow for tying the upstream segment of the mat that protects the channel bed into the crest of the structure, and the downstream segment of the mat that protects the right bank into the bank at the structure outlet.

As noted above, GCS #4 may not be necessary if the existing key-down depth of the Camino de Las Huertas Culvert foundation exceeds the predicted incision depth of 6.3 feet. Regardless of whether the structure is deemed necessary, the sacrificial washout section of the road embankment should be hardened to prevent failure of this section, which would likely result in upstream incision that could threaten the buried pipelines in the upstream channel bed. The roadway hardening should include some form of protection on the downstream side of the embankment (i.e., the "spillway"). Although more detailed modeling of this area would be required to determine the hydraulic conditions and potential for scour, results from the existing hydraulic modeling indicate that this section of the roadway, as currently configured, conveys about 2,400 cfs of the 11,300-cfs discharge at the 100-year peak (future development

conditions hydrology), at velocities of up to 3 fps. Because these velocities are relatively low, it is likely that riprap revetment would be a suitable form of protection for the embankment spillway.

3.3.2. Bank Protection

Riprap revetment is recommended for the areas where bank protection is necessary because it is more flexible than gabion structures and, therefore, is more suitable for the minor channel adjustments (i.e., incision) that are expected along the project reach. In addition, in coarse bed material systems such as the project reach of Las Huertas Creek, gravels and cobbles that are transported during flood events tend to damage the gabion baskets. Based on results from the hydraulic modeling (Tetra Tech, 2010) and using the future developed conditions 100-year peak flow as the design discharge, the median size of the riprap should be 20 inches with a D_{30} of 16 inches. The riprap should extend to an elevation that is equal to the 100-year (developed conditions hydrology) water-surface elevation plus 2 feet of freeboard, except in locations where this water-surface elevation exceeds the top of bank, in which case the revetment should extend to the top of bank (**Table 3**; **Figure 4**). [The hydraulic model of Las Huertas Creek that was developed for Tetra Tech (2010) should be modified to represent design conditions in order to determine the 100-year water-surface elevation and the necessary height of the revetment. A similar model should be developed to determine these design parameters for the recommended riprap in Arroyo del Ojo del Orno.] The riprap should also be keyed down into the bed to a depth equal to the estimated scour, which includes long-term scour and bend scour (Table 3), since no antidune scour is likely due to the relatively coarse bed material in these areas. The riprap should have a minimum thickness equal to 30 inches based on a $1.5*D_{50}$ criteria.

Table 3. Summary of estimated scour depths and the resulting toe-down for the recommended riprap revetments along Las Huertas Creek.

Downstream Station (ft)	Upstream Station (ft)	Average 100-yr WSE (ft)	Avg. Recommended Top Elev. (ft)	Length (ft)	Bank	Long-term Scour (ft)	Bend Scour (ft)	Recommended Toe-Down (ft)
58+80	62+80	5461.3	5459.0	360	Left	2.3	3.0	5.3
61+00	63+20	5463.6	5461.3	230	Right	0.7	3.2	3.9
110+80	114+30	5574.0	5576.0	370	Left	0.5	3.2	3.7

3.4. Recommendations for Monitoring and Additional Evaluation

In addition to the recommendations for monitoring that were presented in Tetra Tech, 2010, a number of additional recommendations were developed during this updated study to protect the pipelines. The depth of the Kinder Morgan lines is not known along the project reach, so it was not possible to develop recommendations for protecting these lines at locations where there are no Enterprise Lines. As such, every effort should be made to determine the burial depths of these lines. As discussed above, if the burial depth of the Kinder Morgan line that runs parallel to the channel along the north bank between Station 82+00 and Station 92+70 is determined

and the top-of-pipeline elevations are higher than the channel invert, bank protection may also be required on the right bank to prevent lateral migration that could endanger this line.

The existing articulated concrete mats could fail due to a variety of different mechanisms, the most common of which involve either (1) downcutting of the reach downstream from the mats such as headcut migration that results in destabilization of the downstream face of the mat, and (2) undermining of the upstream face of the mats due to scour associated with impinging flows. Because the recommended grade control structures were located in a manner that should prevent incision at the downstream face of the mats, this mode of failure is not anticipated at any of the mats upstream from GCS #1 at Station 85+00. However, because no grade-control structure was recommended downstream from the recently installed mat near Station 59+50, this mat should be monitored periodically to insure the downstream face of the mat is not in danger of failure. In general, the most common method for protecting the upstream face of the mats against impinging flow scour involves proper key down of the mat into the channel bed. A field evaluation to determine the degree of key down along the upstream face of the mats should be carried out, and if the key down is determined to be insufficient to protect against the impinging flow scour, the mats should be refurbished with properly designed burial depths.

The depth of key-down for the foundation of the Camino de Las Huertas culverts should be determined by either reviewing as-built drawings or through a field investigation. As discussed previously, this information is important because GCS #4 is only recommend if the predicted depth of incision (6.3 feet) exceeds the foundation key-down. If it is determined that GCS #4 is necessary to protect the culvert crossing, this structure should be designed with a crest elevation that is sufficiently high to protect the foundation, while minimizing the drop height to reduce costs.

The very high right (north) bank of the arroyo along the outside of the bend between Station 73+00 and Station 77+00 appears to be relatively stable at the current time, and the estimated bank erosion rates are relatively low, so no bank protection was recommended to protect the Enterprise lines that are buried a short distance beyond the top of the bank. However, this area should be monitored to insure that future bank erosion does not threaten the pipelines. The existing gabion bank protection in Subreaches 8 and 9 should be monitored to insure the baskets are intact and the bank protection is functioning as intended. For the reach of Arroyo del Ojo del Orno where bank protection (and possibly grade control) is recommended, hydraulic and channel stability analyses similar to those conducted for Las Huertas Creek should be carried out to properly design the stabilization measures.

4. SUMMARY

Previously developed hydraulic models and the associated sediment-transport and channel stability analyses were used in conjunction with pipeline location information to update recommendations for channel stabilization measures that were originally developed by Tetra Tech (2010). These recommendations generally include grade-control structures to provide vertical controls that will limit down cutting, bank protection in areas where the pipelines are buried in the banks along the outside of bends or where residential structures are at risk, and a number of items that should be evaluated in the future after additional information becomes available. The following list of items is a summary of the specific recommendations that were developed for the reach between the Camino de Las Huertas road crossing and the eastern boundary of the Placitas Open Space that was considered in this study:

1. Three grade-control structures are recommended in the reach downstream from the Camino de Las Huertas road crossing to protect the buried pipelines (Figure 1 and Table 1). These structures should be designed with drop heights that are large enough to protect against the predicted incision, and should be designed with proper scour protection to protect the buried lines against plunge scour (Table 1). A fourth grade-control structure may be necessary to protect the Camino de Las Huertas culverts if the key-down depth of the culvert foundation is less than the predicted depth of incision at this location.
2. About 1,100 lineal feet of bank protection is recommended at three locations to safeguard pipelines that are buried in the left (south) bank of Las Huertas Creek and Arroyo del Ojo del Orno (Table 2). An additional 230 feet of bank protection was recommended at one location in Tetra Tech (2010) to protect residential structures on the right (north) bank. The bank protection should be designed based on guidelines presented in the Design Guide with the general dimensions outlined in Table 3.
3. Because the burial depth of the Kinder Morgan lines is unknown at most locations along the project reach, the grade control and bank protection is primarily recommended to protect the Enterprise pipelines. The burial depth of the Kinder Morgan pipelines should be determined, and these recommendations should be updated to ensure the safety of all pipelines.
4. The degree to which the existing articulated concrete mats are keyed down should be determined, since this key-down safeguards the upstream face of the mats against impinging flow scour. If this key-down is determined to be insufficient or non-existent, the mats should be refurbished with properly designed key-down.
5. The existing articulated concrete mats and gabion structures should be periodically monitored to insure that these elements are functioning as designed, and bank erosion should be monitored at select locations where pipelines are buried along the outside of bends, but the estimated bank erosion rates were deemed to be insufficient to warrant bank protection.

5. REFERENCES

Mussetter Engineering, Inc., 2008. Sediment and Erosion Design Guide. Prepared for the Southern Sandoval County Arroyo Flood Control Authority, Rio Rancho, New Mexico, November, 246 p.

Tetra Tech, Inc., 2010. Channel Stability Analysis and Prudent Line Assessment for Las Huertas Creek, Sandoval County, New Mexico. Prepared for Wilson and Company, Inc., Rio Rancho, New Mexico, October 15.

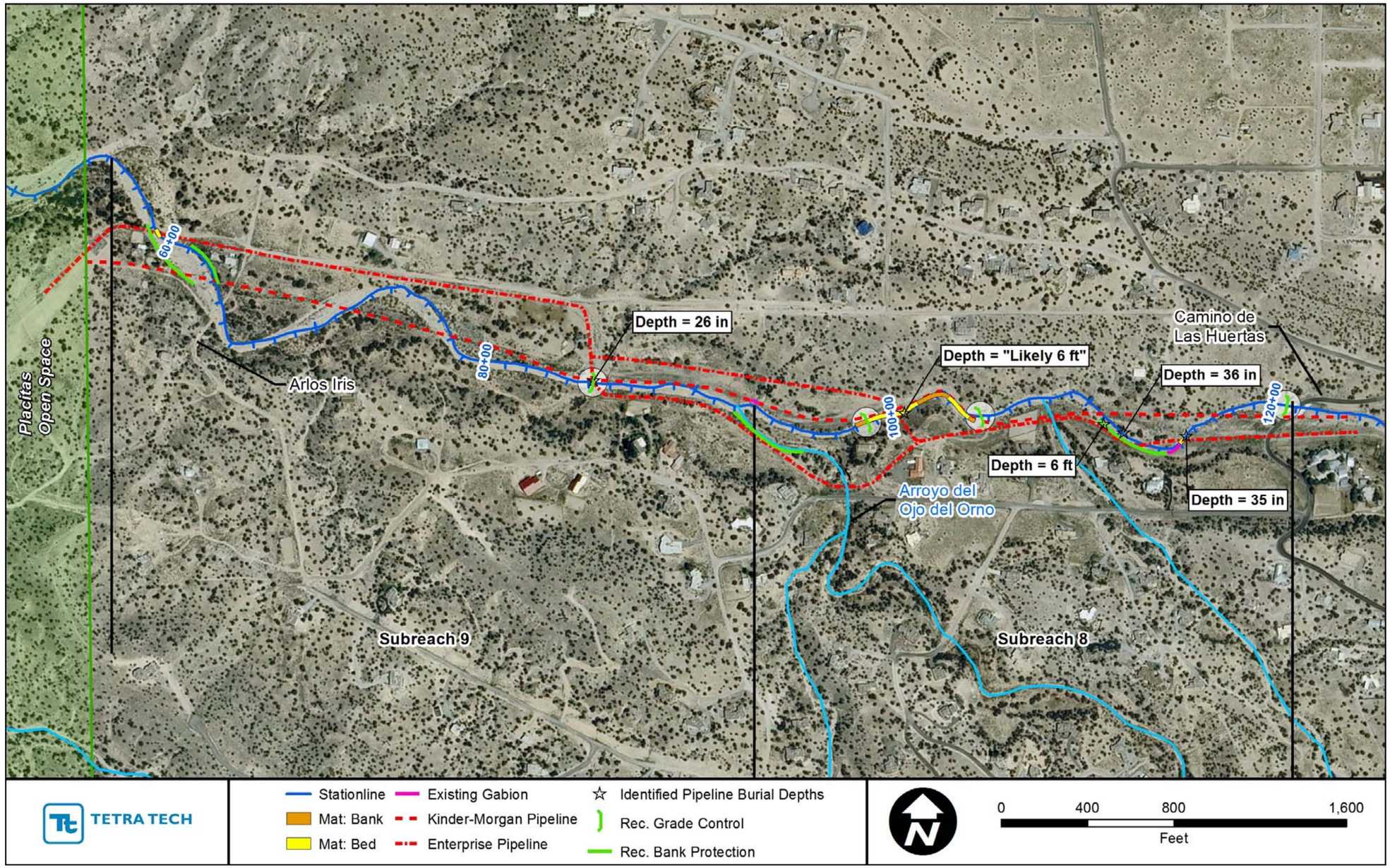


Figure 1. Aerial photograph showing the location of the buried pipelines and other key features in Subreaches 8 and 9 of Las Huertas Creek.

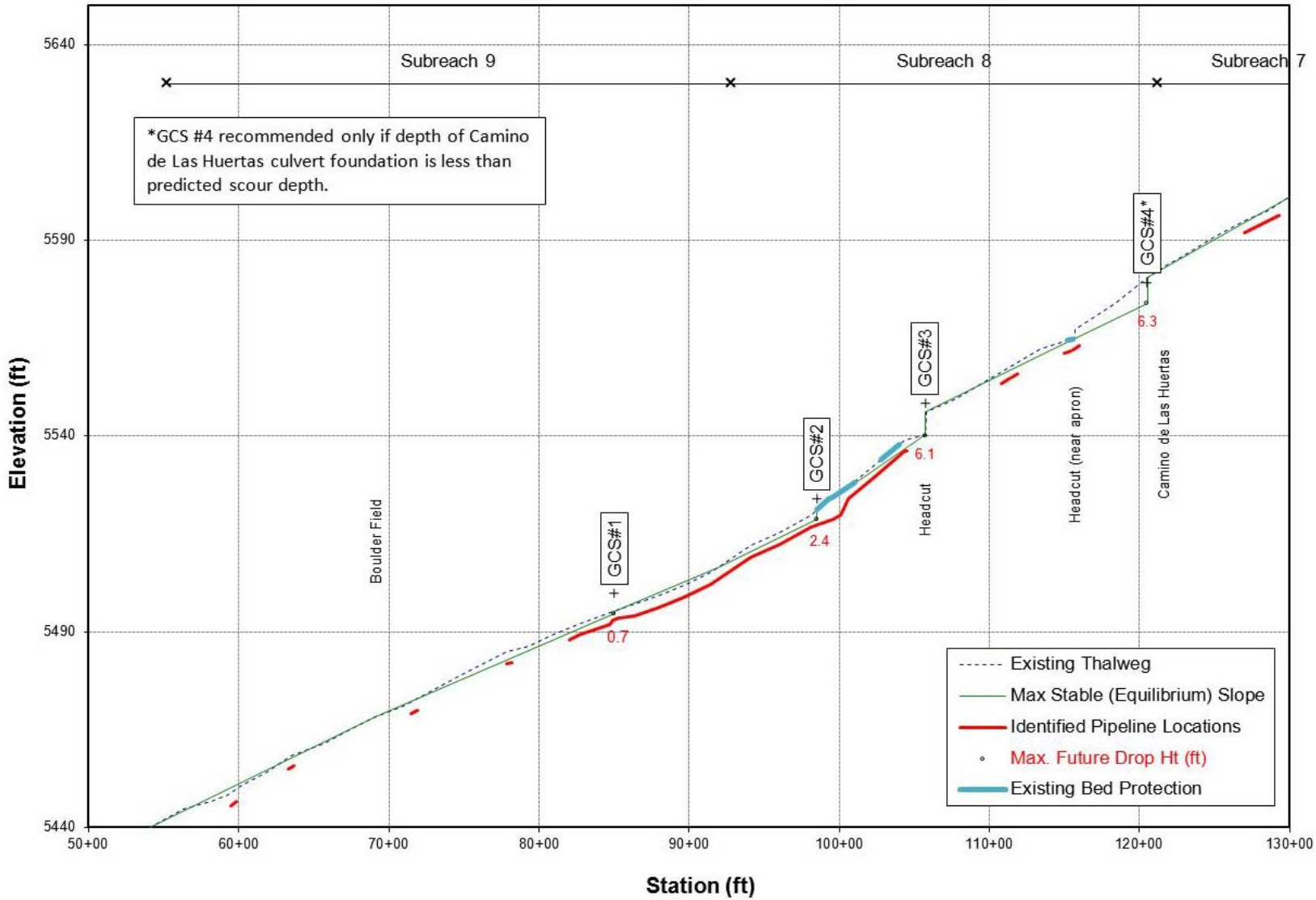


Figure 2. Existing thalweg profile and estimated or measured top of pipeline profile in Subreaches 8 and 9 of La s Huertas Creek. Also shown is the future profile after incision with the recommended grade control structures.

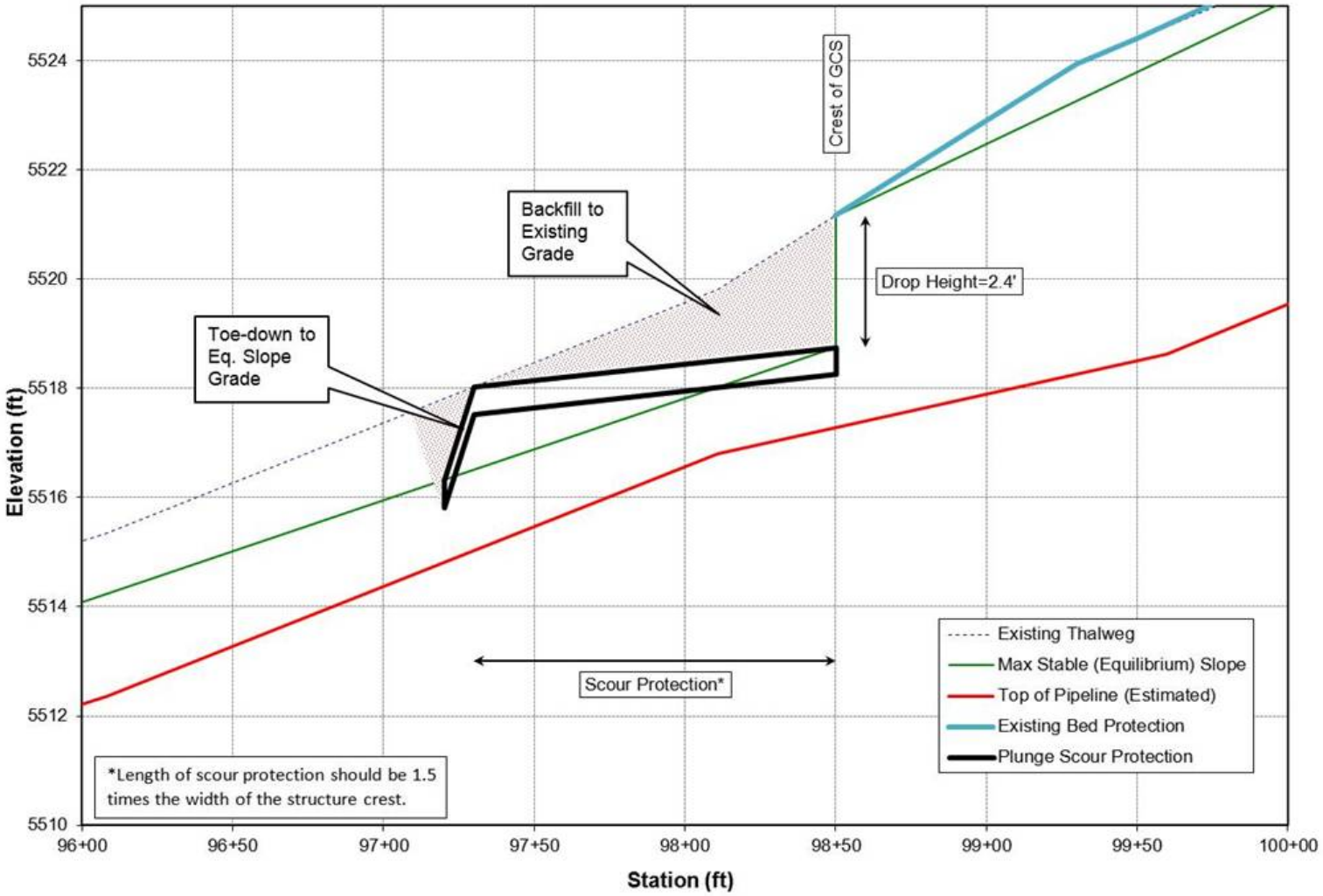


Figure 3. Example profile along grade-control structure GCS #2 where bed protection is recommended below the structure crest to protect the buried pipelines against plunge scour. The length of the scour protection (120 feet) is based on an assumed crest width of 80 feet.

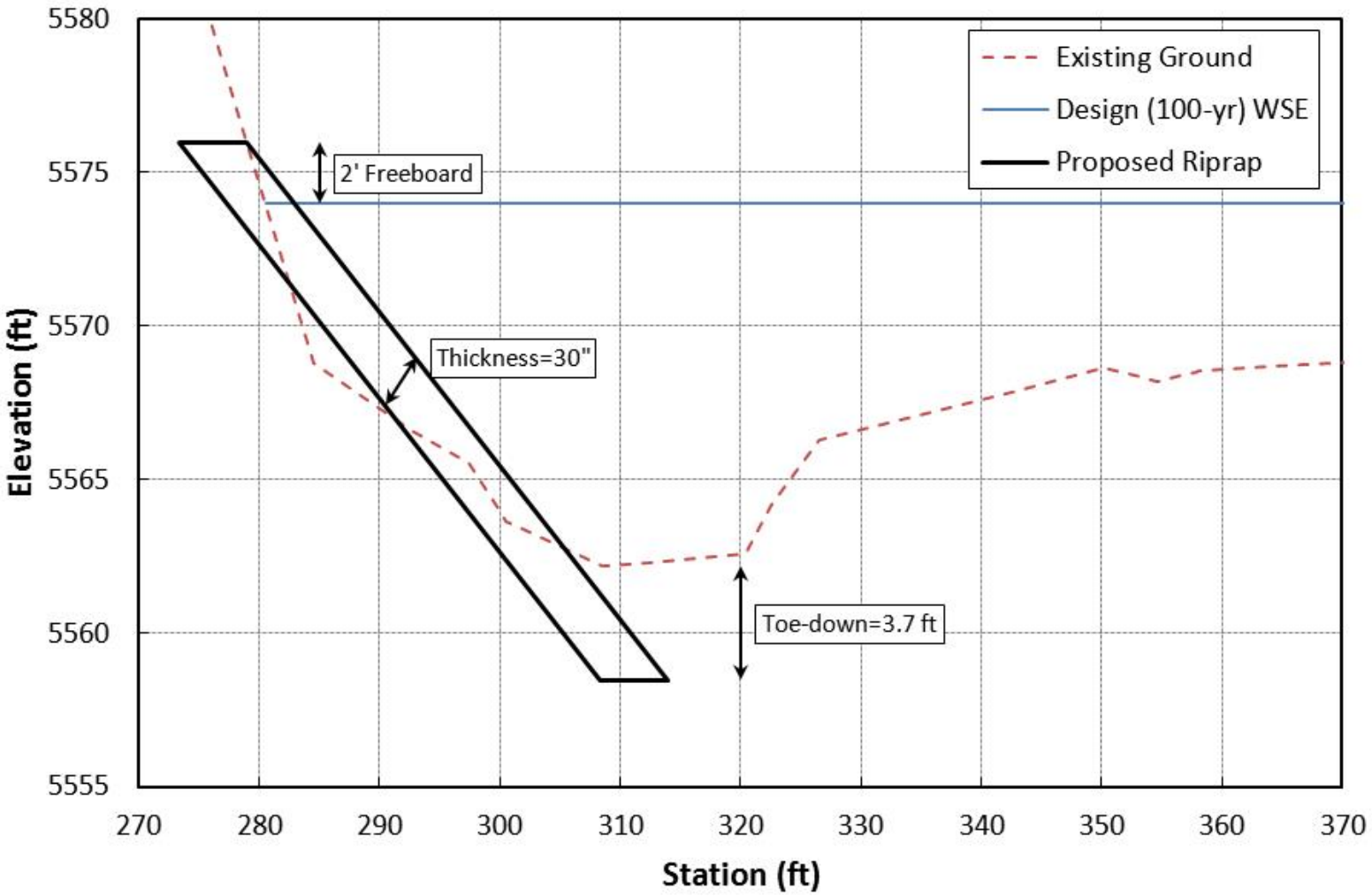


Figure 4. Cross Section 11338 showing typical dimensions of the recommended riprap revetments.

III. Pipeline Grant Report-History/Background

New Mexico's oil and gas industries are located in the northwest and southeast corners of the state. Several pipelines carry products between these areas, as well as to/from out-of state sources.

The Sandia and Manzano Mountains in the north central part of the state, form a barrier around which pipelines must pass. One such pipeline corridor goes through the village of Placitas, and a portion of this corridor lies in the watershed of Las Huertas Creek [arroyo], the major watercourse which drains the village.

"The Sandia Mountains have been occupied by human beings for thousands of years.
Settled in 1767 when Governor Pedro Fermin de Mendinueta made the land grant known as La Merced de San Antonio de Las Huertas. The area is known as 'Las Placitas' because it contains several villages, also known as 'plazas'.

Descendants of the stockmen and farmers who first settled the grant still live in the vicinity." [From Historic marker, Highway 165 in Placitas].

The older portion of the village is built on the north slope of the Sandia Mountains.It is irrigated by acequias [ditches] which draw their water from springs and Las Huertas Creek , and is drained by several tributary arroyos which flow northerly to Las Huertas Creek. These arroyos and Las Huertas Creek comprise a drainage area of some 29 square miles, and are subject to snowmelt runoff and summer flash floods. Newer portions of Placitas generally drain elsewhere.

In the last 50 years, the community has grown, first with an influx of "hippies", and more recently, with upscale subdivisions and pricey homes. Included in that growth were the installation of petroleum, natural gas, and CO2 lines between 1972 and 1995. Currently, in and adjacent to Las Huertas Creek are two 12-inch liquid natural gas lines, installed in 1980 and 1995; an 8-inch refined products line, installed in 1972 [gasoline, diesel, jet fuel]; and a 30-inch CO2 line installed in 1986.

Along a two-mile portion of Las Huertas Creek, pipelines were buried in, and crossed, the Creek bottom. Homes, structures, corrals, and yards also were built in desirable locations along the Creek, sometimes on or near the pipelines. This juxtaposition of uses inevitably raised concerns about safety.

In 2006, a major rainstorm caused damage along Las Huertas Creek, including the exposure of pipelines where high flows had scoured away the creek bottom and/or banks. This event heightened concerns of residents, and led, at least to some degree, to the formation of the Eastern Sandoval County Arroyo Flood Control Authority [ESCAFCA].

Responding to community concerns, ESCAFCA commissioned an engineering study to predict how the Las Huertas Creek would behave over a 30-year period of typical storms, coupled with a 100-year storm. The study identified the expected vertical and lateral migration of the creek, and established a line on each side of the creek, within which it would not be prudent to build [the "Prudent Line"]. It also identified areas of potential scour which could expose the buried pipelines and subject them to damage or failure.

It was at this juncture that ESCAFCA applied for, and received, a grant from the US Department of Transportation [USDOT] Pipeline and Hazardous Materials Safety Administration [PHMSA] to conduct further engineering analysis and public outreach to determine which, if any, measures might be advisable. The overall effort and resulting reports are also intended to demonstrate that analytical engineering can be of value in determining how deep and in what locations pipelines should be buried, when a watercourse is involved.

This report is the final product of that grant effort.

IV. Pipeline Grant Report-The Process

This section documents the process used to accomplish the objectives of the USDOT grant.
Certain documents, as noted , are not included in this report, because of their volume, and because they have been previously distributed to involved or interested parties. Hard copies are available in ESCAFCA files, and can be provided electronically on request. Those documents will be so noted , but will be summarized for understanding.

A. The area of concern is along Las Huertas Creek [arroyo] in the village of Placitas, NM, as depicted on the map, Reference 1, attached.

B. The Las Huertas Canyon Watershed Restoration Action Strategy [WRAS] , September 30, 2005, identified " the pipeline corridors a major environmental and human health and safety concern of local residents [LPA 2005a]" [page 7].Attached Reference 2,also on file.

C. In the summer of 2006, major storm events in the Las Huertas watershed caused significant damage to the streambed and road crossings, and exposed pipelines in the creek bottom. Although estimated flows were significant [6,000 to 8,000 cfs], they were not as large as the predicted 100-year event [10,000 cfs]. Repairs were made by the pipeline companies. See photos in Reference 3, attached.

D. Before ESCAFCA was voted into existence in November 2008, it received funds from the State Legislature and other government agencies to determine flood control needs. ESCAFCA contracted with HDR Engineering Inc. to conduct a needs assessment. This study effort included public meetings in the three affected communities, during which attendees were asked to identify concerns. The HDR Interim Preliminary Needs Assessment, July 12, 2007, stated that in Placitas "several residents noted strong safety concerns about the existing pipelines adjacent to and crossing arroyos in the area. Residents were also concerned about the adequacy of current repairs on arroyo crossings." [p.4]. The report also recommended to "perform a thorough hydraulic and scour analysis of pipeline crossings in the area" [p. 6]. Reference 4, on file.

E. Upon receipt of the HDR study, ESCAFCA than contracted with Wilson and Company, Inc. to develop a Drainage Master Plan. This plan identified as a Documented Drainage Problem " Erosion of arroyos resulting in damage to roadway embankments and exposure of natural gas pipelines" [p.8], and stated "Of the issues affecting Placitas residents, the issue of erosion and exposed natural gas and exposed pipelines within arroyos is by far the most serious" [p. 18], and

recommended "that channel stabilizing structures are constructed within arroyos containing pipeline infrastructure" [p. 19]. It also "recommended that one of ESCAFCA's priorities in the Placitas area be to establish erosion limits of existing major arroyos (i.e., the maximum anticipated extent of erosion within an arroyo)"[p. 18], [a so-called 'prudent line']. [Reference 5, on file].

F. In November, 2008, ESCAFCA was voted into existence, along with approval of a $3 million bond issue, thus giving ESCAFCA the ability to begin engineering studies and projects.

G. Responding to the concerns of Placitas residents, one of ESCAFCA's first projects was to conduct an engineering study of Las Huertas Creek [arroyo] to predict how it would behave over a 30-year period of typical storm flows, coupled with a 100-year event. The study was to predict vertical and horizontal movement of the streambed, and thus establish lines along each side of the creek within which it would not be prudent to build [so-called "prudent lines"]. A second major component of the study was also to identify potential scour in areas where pipelines were located. This study was authorized by Task Order No. 11 "Las Huertas Creek Prudent Line Assessment and Letter of Map Revision (LOMR)" , dated 10/20/09, and Amendment 1, dated 1/6/2011, for a total appropriation of $195,000. Reference 6, attached.

H. On August 17, 2009, the Cedar Creek Homeowners Association hosted a meeting in Placitas, at which residents expressed concerns to Federal and State regulators and pipeline company representatives over the possibility of damage or failure during storm events. The ESCAFCA Board Chairman informed all present that ESCAFCA had initiated a study [Reference 6, above] which would address this very issue. A committee was formed to assist and advise [but never did anything]. Minutes of this meeting are attached as Reference 7.

I. In the fall of 2009, ESCAFCA learned of the availability of USDOT grants for pipeline safety issues. On December 8, 2009, the Board authorized expenditure of $5,913.72 to prepare a grant application [Task Order No.12, Reference 8, attached] and in January, 2010, ESCAFCA submitted a request for a Technical Assistance Grant for $50,000.00. The Grant Agreement was subsequently executed on September 30, 2010 [Reference 9, on file].

J. On October 19, 2010, the ESCAFCA Board of Directors approved Task order No. 15, the ESCAFCA Pipeline Grant Work Plan, and appropriated up to $50,000.00, to be reimbursed by the USDOT under the Grant Agreement [Reference 10, attached]

K. The "Channel Stability Analysis and Prudent Line Assessment for Las Huertas Creek, Sandoval County, New Mexico", was completed on October 15, 2010 [Reference 11, on file]. Using recognized engineering techniques, the study established erosion risk limits along Las Huertas Creek [prudent lines], and predicted scour depths along the creek where pipelines are buried. At some pipeline locations, scour predictions were 6 to 8 feet. Assuming pipelines were buried at least 30 inches deep, as specified by 42 CFR 192.139-327, it was apparent that some pipelines might be at risk. Accordingly, the two pipeline companies were asked to field identify location and depths, so that a more exact analysis of risk could be performed. Only Enterprise Products responded.

L. As part of the work plan, public meetings were to be held to inform residents of the study results, solicit comments, and recommend solutions. The first meeting, scheduled for December 16, 2010, was cancelled because of snow. Subsequent meetings were scheduled for January 11, January 26, and February 22, 2011. Pipeline companies and government regulators were invited by letter, and Placitas residents were invited via flyers and newspaper ads. Attendance was dismal at the first two meetings, and no one attended the February 22 meeting. Especially obvious was the lack of attendance by the Cedar Creek homeowners. To help remedy this, the New Mexico Public Regulation Commission sponsored a third meeting on April 28,2011,at which some 30 people attended, 15 of which were pipeline company representatives. Copies of the meeting notices and meeting minutes are at Reference 12, attached.

M. On May 5, 2011, a time extension was granted, allowing the Final report and final financial report to be submitted by December 31, 2011. A copy of that document is at Reference 13.

N. In order to complete the engineering analysis of the scour potential on the pipelines, the two affected pipeline companies were repeatedly asked to provide field crews to ascertain pipeline location and depth within and along the creek. Because the ground was frozen January through March, this effort was delayed. Ultimately, only Enterprise personnel participated in this effort, and on July 29, 2011, a productive field reconnaissance was made, during which the Enterprise lines [2-12 inch NGL lines and one 8 inch refined product line] were located and plotted. The field notes and map resulting from this effort are at Reference 14, attached.

O. The field notes were transmitted to the consulting engineers for final analysis and a report. This report is entitled “Technical Memorandum: Recommendations for Channel Stability Measures in Las Huertas Creek, Sandoval County, New Mexico”, and is included in this Pipeline Grant Report as Section II, Conclusions/Recommendations. The Technical Memorandum recommends construction of four [4] grade control structures, additional bank protection at four [4] locations along Las Huertas Creek to help protect the pipelines, and monitoring of existing protection. This Technical Memorandum represents the culmination of the work to be done under this grant.

P. The thrust of this grant-funded project is to demonstrate that engineering analysis can be used to determine appropriate depth [or bank setback] for buried pipelines in or adjacent to watercourses, especially those in ephemeral streams. Rather than simply following” guidelines”, there may be many instances where engineering analysis of the type done here might prevent serious consequences, such as happened on the Yellowstone and Missouri Rivers in 2011. See attached news articles at Reference 15.

Q. Because Placitas and Las Huertas Creek are no longer under ESCAFCA jurisdiction [by Legislative action-HB306, April 6, 2011]. ESCAFCA will not take any further action to implement the recommendations contained in the Technical Memorandum. However, copies of this entire Pipeline Grant Report will be provided to pipeline companies, regulatory agencies, the Placitas

library and Community Center, and government agencies for whatever action is deemed appropriate. The distribution list is listed below.

USDOT Pipeline and Hazardous Materials Safety Administration- 2 [electronically]
Enterprise Products-1
Kinder Morgan-1
NM Public Regulatory Commission-Pipeline Safety Bureau-1
Sandoval County-2
Placitas Library-2
Placitas Community Center-1
ESCAFCA-3
Wilson and Co.Inc-1

V. Pipeline Grant Report-References

1. Area Map, National Pipeline Mapping System
2. Las Huertas Canyon Watershed Restoration Action Strategy, Version 2.0, September 30, 2005, Reid Bandeen, P.G., Principal Author
3. Photographs, 2006
4. Interim Preliminary Needs Assessment, July 12, 2007, HDR Engineering, Inc, prepared for ESCAFCA
5. Drainage Master Plan and Needs Assessment, Wilson and Company, Inc, for ESCAFCA, June 27, 2008
6. Task Order No. 11 Las Huertas Creek prudent Line Assessment and Letter of Map Revision(LOMR), 10/20/09, and Amendment 1, 1/6/2011
7. Pipeline Meeting Minutes—August 17, 2009, submitted by Larry A. Blair, Executive Engineer, ESCAFCA
8. Task Order No. 12,Pipeline and Hazardous Material Safety Administration Grant Assistance, 12/8/09
9. GRANT AGREEMENT between ESCAFCA and U. S. Department of Transportation, dated Sep 30,2010, with Pipeline Grant Work Plan [10/14/2010], and modification to AGREEMENT, dated 5/5/11
10. Task Order No. 15 Pipeline Grant Administration, 10/19/10
11. Channel Stability Analysis and Prudent Line Assessment for Las Huertas Creek, Sandoval County, New Mexico, by Wilson & Company, Inc. and Tetra Tech for ESCAFCA, dated October 15, 2010
12. Public Meeting notices, minutes, and notes
13. Executed Grant Agreement #DTPH56-10-G-PHPT03, Modification #0001 [Time Extension],5/5/11
14. Field notes and map from August 29,2011 reconnaissance
15. News Articles on Yellowstone and Missouri Rivers, 2011

VI. Pipeline Grant Report- Acknowledgements

Thanks to the following people for their assistance, involvement, and support:

Reid Bandeen, for his WRAS report, his interest, and constructive input.

Carol Parker, for encouragement and advice.

Sefie Anaya, NM PRC Pipeline Safety Bureau, for organizing a public meeting and good advice.

Tony Lucero, San Antonio De Las Huertas Land Grant and Las Placitas Acequia Association, for his historical perspective and valuable input.

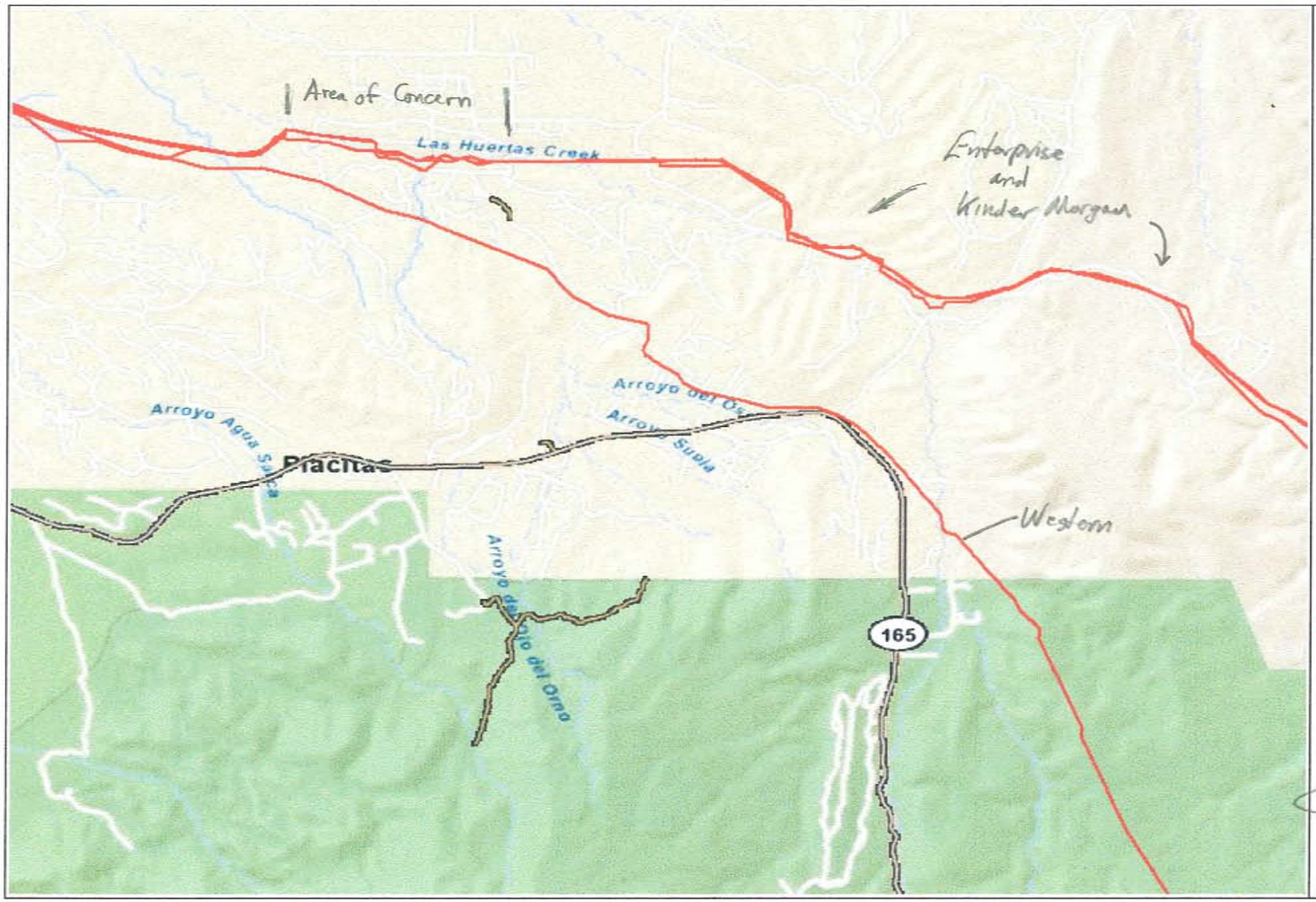
Robert North, Enterprise Products Farmington Supervisor, for his expert and cooperative help in the field.

Angela Valdez, Wilson And Co. Inc, for her patients and cheerful assistance in applying for the grant, preparing material, and for sticking with it.

From John Jacobi
PHMSA

Pipeline and Hazardous Materials Safety Administration

NATIONAL PIPELINE MAPPING SYSTEM



Legend

Hazardous Liquid Pipelines

Pipelines depicted on this map represent gas transmission and hazardous liquid lines only. Gas gathering and gas distribution systems are not represented.

This map should never be used as a substitute for contacting a one-call center prior to excavation activities. Please call 811 before any digging occurs.

Questions regarding this map or its contents can be directed to npms-nr@mbakercorp.com.

Projection: Geographic

Datum: NAD83

Map produced by the NPMS Public Viewer at www.npms.phmsa.dot.gov

Date Printed: Dec 09, 2010

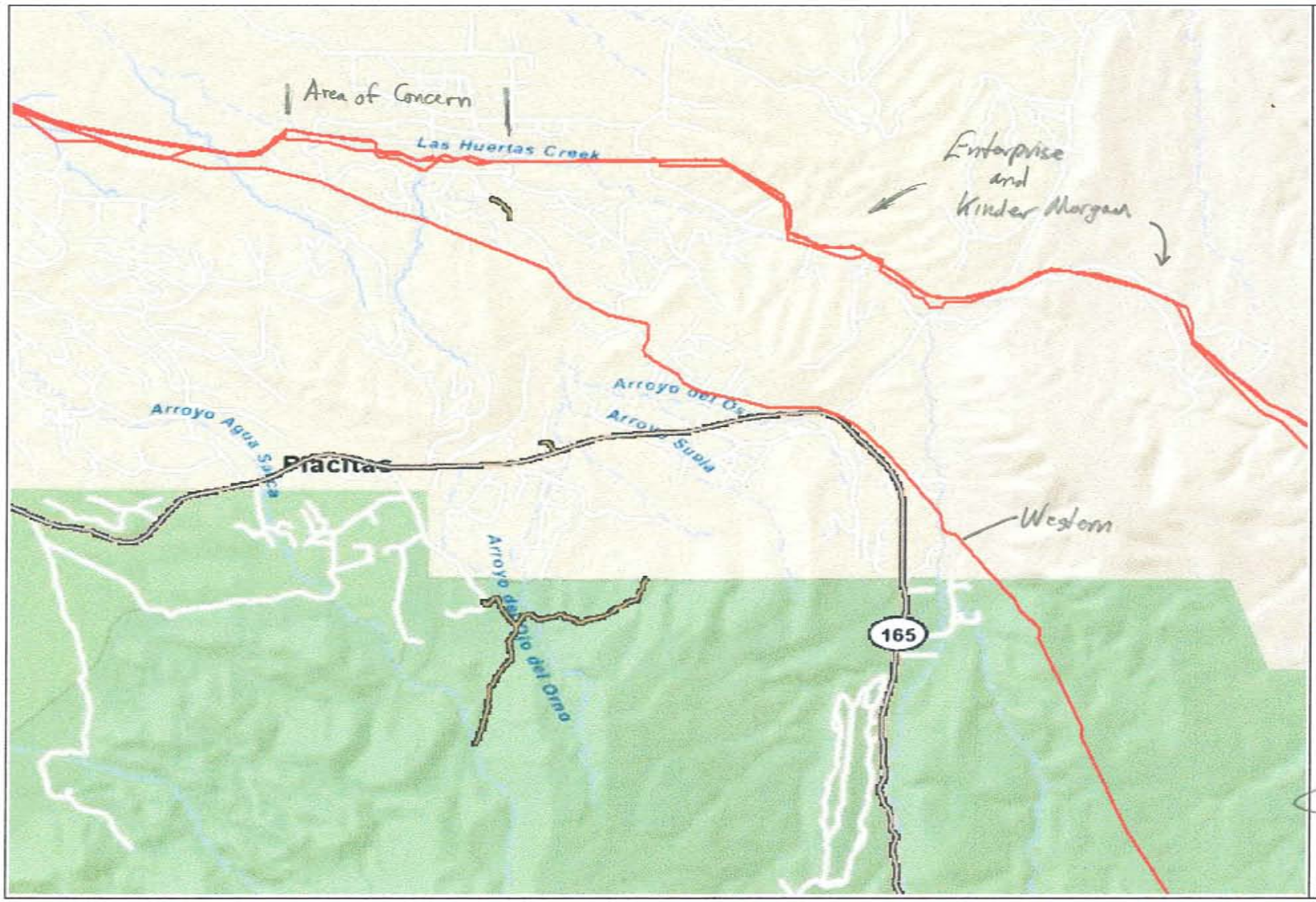
811 Know what's below. Call before you dig.

Reference 1

From John Jacobi
PHMSA

Pipeline and Hazardous Materials Safety Administration

NATIONAL PIPELINE MAPPING SYSTEM



Legend

Hazardous Liquid Pipelines

Pipelines depicted on this map represent gas transmission and hazardous liquid lines only. Gas gathering and gas distribution systems are not represented.

This map should never be used as a substitute for contacting a one-call center prior to excavation activities. Please call 811 before any digging occurs.

Questions regarding this map or its contents can be directed to npms-nr@mbakercorp.com.

Projection: Geographic

Datum: NAD83

Map produced by the NPMS Public Viewer at www.npms.phmsa.dot.gov

Date Printed: Dec 09, 2010

811 Know what's below. Call before you dig.

Reference 1

Las Huertas Canyon
Watershed Restoration Action Strategy (WRAS)

Version 2.0

September 30, 2005

Prepared by the Las Huertas Watershed Project, Placitas, New Mexico

Reid F. Bandeen, P.G. Principal Author

if not properly managed, leading to erosion, incising of drainages, and associated increased siltation/sedimentation in the Creek. ORV and non-motorized recreation may also contribute to erosion by establishing trails that become drainage pathways that erode during runoff events.

Mining Operations

Another allowable use of BLM land is leasing for mining. Lafarge North America Inc. conducts gravel mining at the northern end of the watershed. Lafarge operates the Placitas Sand and Gravel operation on 800 acres leased from BLM that are closely surrounded by several Placitas area subdivisions (DeMello, 2005). Lafarge additionally operates the Santa Ana pit and Santa Ana asphalt plant, both on and abutting the Santa Ana Reservation and BLM land. Lafarge may expand mining operations on the Santa Ana pit eastward onto an additional 275 acres of BLM lease land (DeMello, 2005).

Petroleum Product Pipelines

Several petroleum product pipelines traverse the northern portion of the Las Huertas Watershed. These pipelines are contained in two corridors that enter the east side of the watershed and merge within the Placitas Open Space (Figure 7). A major pipeline corridor operated by the Mid-America Pipeline Company (MAPI) borders Las Huertas Creek on private land, the POS, BLM and finally Santa Ana Pueblo land. An Environmental Assessment was recently published proposing the construction of an additional natural gas liquids pipeline within the Placitas watershed pipeline section, calling for the expansion of the existing pipeline right of way by 25 feet (Diven, 2005). Recent local product leak and release incidents, together with recent spectacular pipeline explosion accidents involving human fatalities near Carlsbad, New Mexico, and Bellingham, Washington continue to make the Placitas pipeline corridors a major environmental and human health and safety concern of local residents (LPA, 2005a).

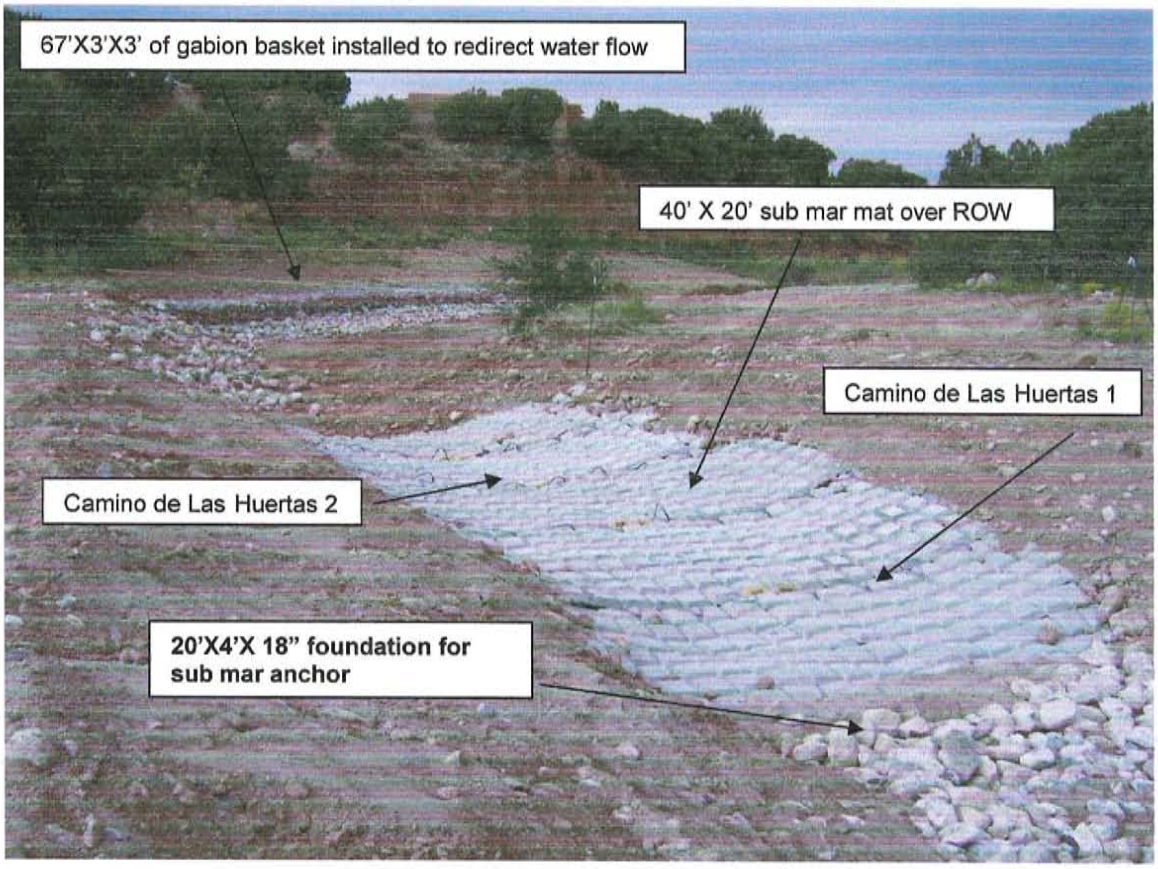
Private Property Owners

Land use by private property holders in the watershed is primarily residential. The creek flows through private properties, and most of the lower perennial reach of the Creek is on private property (Figures 3 and 7). Private land uses in the lower canyon include limited livestock and equestrian grazing, and small-scale agriculture.

Most small-scale agriculture in the Placitas area operates through one of three membership acequias: 1). Las Acequias de Placitas; 2). Rosa de Castilla; and 3). Las Huertas Community

Exposed pipelines on Las Huertas Creek

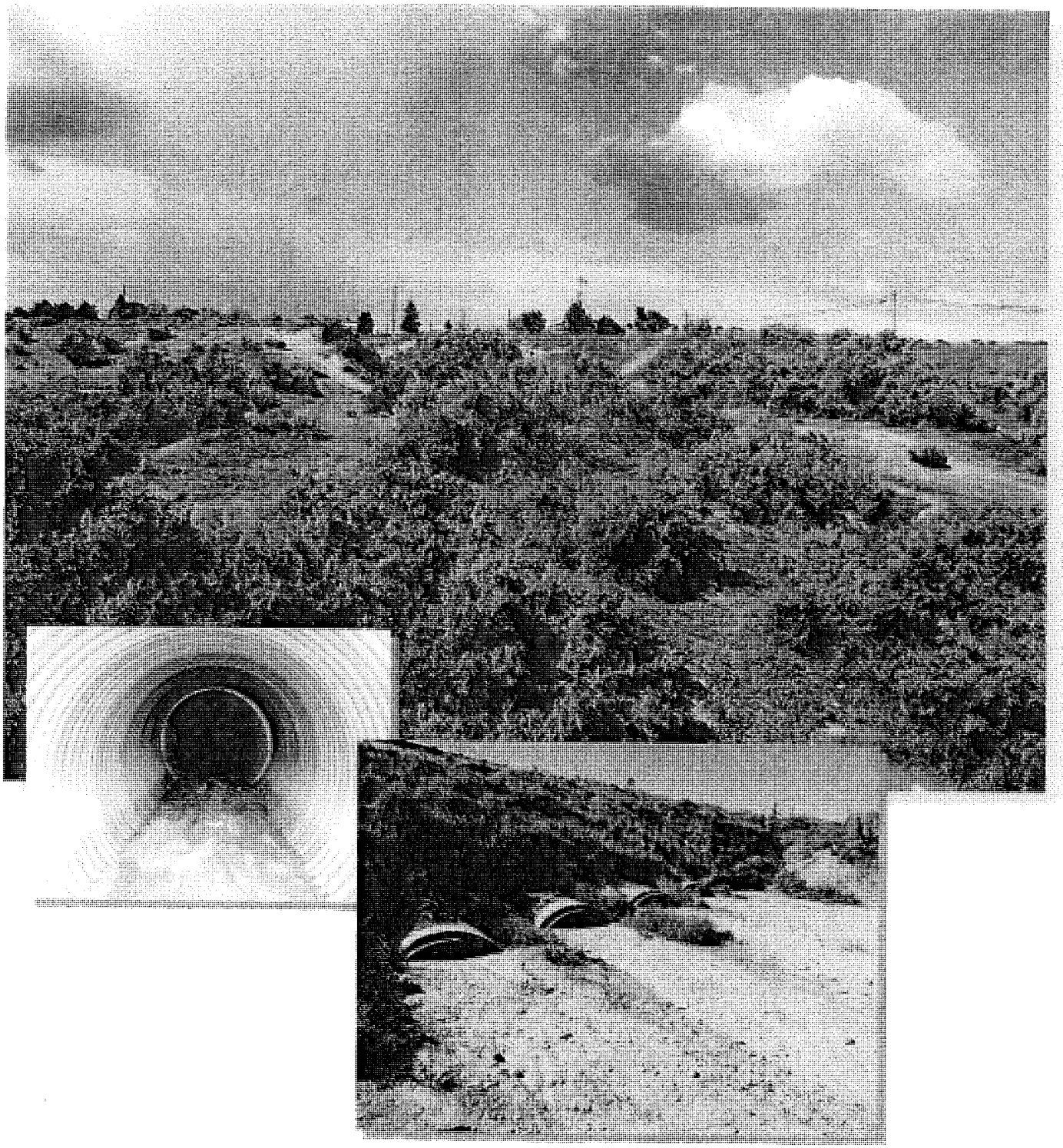
Camino De Las Huertas 1 & 2 after repairs. Both pipelines were re coated, rock shield installed and backfilled.



July 2009

Eastern
Sandoval County Arroyo Flood Control Authority

INTERIM PRELIMINARY NEEDS ASSESSMENT



HDR | ONE COMPANY *Many Solutions*℠

July 25, 2007

Reference 4

DRAINAGE MASTER PLAN
AND
NEEDS ASSESSMENT

PREPARED BY:
WILSON & COMPANY, INC.
2600 THE AMERICAN ROAD SE
RIO RANCHO, NEW MEXICO 87124
(505) 898-8021

PREPARED FOR:

ESCAFCA
Eastern Sandoval County Arroyo Flood Control Authority

JUNE 27, 2008

EASTERN SANDOVAL COUNTY ARROYO FLOOD CONTROL AUTHORITY
TASK ORDER NO. 11 (Amendment 1)

Master Contract No. Engineering On Call Approval Date 01/03/11

1. Engineer: Wilson & Company, Inc., Engineers & Architects

2. Project Title: Las Huertas Creek Prudent Line Assessment and Letter of Map Revision (LOMR)

3. Project Description: Analysis and Report of Las Huertas Creek to assess channel stability and identify an appropriate lateral erosion corridor.

4. Location: Las Huertas Creek (Placitas, NM) between the boundary of the Open Space and the National Forest Boundary

   Maps attached Yes _____ No X

5. Scope of Additional Services Required: Additional engineering analysis effort to complete LOMR submittal to FEMA and provide additional information and analysis at FEMA reviewers request; additional printing and shipping expenses; additional fee to cover $5,300 FEMA review fee and purchase of electronic data (FEMA Kit) and FIS Study information needed for LOMR.

6. Cost/Fee: Lump Sum $5,300 (FEMA Review Fee); $146 (FEMA Kit Fees)
   T&M NTE Engineering Fee Increase by $20,410 (Increased Total Task Fee to $195,018.74).

7. Additional Attachments: _____

_____ Date 1/6/2011
ESCAFCA Chairman

_____ Date 1/3/2011
ESCAFCA Executive Director

_____ Date 1/3/2011
Engineer/Title

t:\pc\escafca\tskordr

Item 12

EASTERN SANDOVAL COUNTY ARROYO FLOOD CONTROL AUTHORITY
TASK ORDER NO. 11

Master Contract No. Engineering On Call Approval Date 10-20-09

1. Engineer: Wilson & Company, Inc, Engineers & Architects

2. Project Title: Las Huertas Creek Prudent Line Assessment and Letter of Map Revision (LOMR)

3. Project Description: Analysis and Report of Las Huertas Creek to assess channel stability and identify an appropriate lateral erosion corridor.

4. Location: Las Huertas Creek (Placitas, NM) between the boundary of the Open Space and the National Forest Boundary

   Maps attached Yes _____ No X

5. Scope of Services Required: Hydraulic and sediment transport study to assess the vertical and lateral stability of the creek and identify the need for vertical control, channel stabilization measures and an appropriate lateral erosion corroder that can be used by ESCAFCA in guiding future development along Las Huertas. Development of the erosion limit line will be consistent with the Prudent Line, as defined by AMAFCA. LOMR services shall include hydraulic (HEC-RAS) modeling and analysis report for submission of a Letter of Map Revision for approval by FEMA. Services are to include up to three (3) Public Involvement Meetings, geotechnical testing for hydraulic analysis, and coordination with property owners. Additional information on scope of services is attached. **This task does not include LOMR applications fees.**

6. Cost/Fee: Lump Sum $ 169,162.74 (excl. NMGRT) T&M NTE _____

7. Additional Attachments: Fee Schedule, Scope of Work

_____ Date 10/20/09
ESCAFCA Chairman

_____ Date 10/16/09
ESCAFCA Executive Director

_____ Operations Manager Date 10/15/09
Engineer/Title

t:\pc\escafca\tskordr

WILSON & COMPANY
ENGINEERS & ARCHITECTS

Fee Proposal Task Order No. 11

Las Huertas Creek Prudent Line Assessment and Letter of Map Revision

WILSON & COMPANY, INC.
2600 The American Rd, SE; Suite 100
Rio Rancho, NM 87124

PREPARED BY: Steve Salazar, PE
PHONE: 505-898-8021
FAX: 505-898-8501
EMAIL: dsaquirre@wilsonco.com; sjsalazar@wilsonco.com

CLIENT: ESCAFCA
PROJECT NUMBER: Task Order No. 11

OH = 168.5%
NEGOTIATED FEE = 12%

WORK CLASSIFICATION	DIRECT LABOR	OVERHEAD	FEE	FULLY LOADED RATE	MAN HOURS	PROJECTED COST
Chief Engineer	$53.27	$89.76	$17.16	$160.19	58	$9,291.23
Lead Project Manager	$45.22	$76.20	$14.57	$135.99	117	$15,910.31
Project Engineer I	$37.52	$63.22	$12.09	$112.83	120	$13,539.62
Project Engineer II	$37.52	$63.22	$12.09	$112.83	232	$26,176.59
Drafter	$19.25	$32.44	$6.20	$57.89	106	$6,136.19
					SUM =	**$71,053.94**
SUBCONSULTANTS						
Tetra Tech, Inc.						$97,020.00
					SUM =	**$97,020.00**
DIRECT EXPENSES						
Mileage per mile		estimated mileage =		320 $0.59		$188.80
Printing and Plotting				$650		$650.00
Miscellaneous Preparation				$250		$250.00
					SUM =	**$1,088.80**

GRAND TOTAL = **$169,162.74**

WILSON & COMPANY
ENGINEERS & ARCHITECTS

Fee Proposal Task Order No. 11

Las Huertas Creek Prudent Line Assessment and Letter of Map Revision

WILSON & COMPANY, INC.
2600 The American Rd, SE; Suite 100
Rio Rancho, NM 87124

PREPARED BY: Steve Salazar, PE
PHONE: 505-898-8021
FAX: 505-898-8501
EMAIL: dsaguirre@wilsonco.com; slsalazar@wilsonco.com

CLIENT: ESCAFCA
PROJECT NUMBER: Task Order No. 11

OH = 168.5%
NEGOTIATED FEE = 12%

WORK TASK	Chief Engineer	Lead Project Manager	Project Engineer I	Project Engineer II	Drafter	Summary by Task
Prudent Line Assessment						
1. Coordination w/ Design Team on hydrologic analysis.	4	6	32		12	54
2. Design Team meetings	16	32	40		12	100
3. Public information meetings and preparation (up to 3 meetings)	6	15	24		18	63
4. Progress updates for Board	12	12	24		12	60
TOTAL for Prudent Line Assessment	**38**	**65**	**120**		**54**	**277**
Letter of Map Revision (LOMR)						
1. Hydraulic Model	8	24		136		168
2. Analysis and report preparation	8	24		80	40	152
3. Public information meeting and preparation (1 meeting)	4	4		16	12	36
TOTAL for Letter of Map Revision (LOMR)	**20**	**52**		**232**	**52**	**356**
Summary by Class	**58**	**117**	**120**	**232**	**106**	**633**

WORK TASK	DETAILED DESCRIPTION OF WORK TASK ACTIVITIES
Prudent Line Assessment	
1. Coordination w/ Design Team	Coordination with Tetra Tech to modify hydrologic analyis in order to provide a workable model for hydraulic analysis.
2. Design Team meetings	Coordination meetings to discuss analysis and progress.
3. Public information meetings	Public meeting and preparation of documents for distribution, exhibits for meeting, etc.
4. Board progress meetings	Periodic progress meetings with Board and Executive Engineer to discuss project progress. These meetings will also serve as an avenue for evaluation of analysis and to gain input from the Board on direction of analysis.
Letter of Map Revision (LOMR)	
1. Hydraulic Model	HEC-RAS Modeling of Las Huertas Creek from Open Space to the National Forest Boundary where Floodplain limits effect residents and businesses. Analysis required to revise current FIS Maps published by FEMA in 2008.
2. Analysis and report preparation	Compilation of analysis and delineation of Floodplain limits for submittal to FEMA. Includes coordination with FEMA for approval and revisions to hydraulics model for final acceptance and LOMR.
3. Public information meeting and preparation (1 meeting)	Public meeting to inform residents of analysis and impending changes to the FEMA FIS Maps.

TETRA TECH

Proposal for Las Huertas Creek Channel Stability and Prudent Line Assessment

Prepared by Robert Mussetter, Ph.D., P.E., Tetra Tech, Inc., Fort Collins, Colorado

September 1, 2009

INTRODUCTION

Based on the field visit and meetings that were conducted by Wilson and Company (Wilson), Tetra Tech (formerly Mussetter Engineering, Inc.), and Mr. Larry Blair on July 28, 2009, Tetra Tech is pleased to submit this proposal to perform a hydraulic and sediment transport study of the approximately 6.4 mile reach of Las Huertas Creek between the upstream boundary of the Placitas Open Space and the National Forest Boundary. The purpose of this study is to assess the vertical and lateral stability of the reach, and based that information, identify the need for vertical control, other potential naturalistic channel stabilization measures and an appropriate lateral erosion corridor that can be used by the Eastern Sandoval County Arroyo and Flood Control Authority (ESCAFCA) to assist the community in guiding future development along the creek. This work will be performed under a subcontract agreement with Wilson, and will include an assessment of the lateral and vertical stability of the creek under existing conditions, identification of existing erosion problem areas, potential changes in the lateral and vertical stability under future development conditions, identification of the location and size of grade controls, and development of an erosion limit line, consistent with the *Prudent Line,* as defined by the Albuquerque Metropolitan and Flood Control Authority (AMAFCA) (Mussetter, et al, 1994), and the Lateral Erosion Envelope (LEE) line, as defined by the Southern Sandoval County Arroyo and Flood Control Authority (SSCAFCA) (Mussetter Engineering, Inc., 2008)].

SCOPE OF WORK

Tetra Tech proposes to perform the following specific tasks to meet the objectives of this study:

1. Obtain and review the available data and information, including the following specific items:

    a. Existing and future development conditions hydrology being developed by Wilson,
    b. Two-foot contour interval topographic mapping of the stream corridor being prepared by Wilson,
    c. Las Huertas Canyon Watershed Restoration Action Strategy (WRAS) (Bandeen, 2005)
    d. Las Huertas Creek Drainage Master Plan and Needs Assessment (Wilson, 2008)
    e. Other available information on the hydrology, geology, and general conditions along the creek corridor.

Tetra Tech, Inc. (formerly Mussetter Engineering, Inc.)
3801 Automation Way, Suite 100, Fort Collins, CO 80525
Tel 970.223.9600 Fax 970.223.7171 www.tetratech.com

TETRA TECH

2. Perform a field reconnaissance of the project reach to identify existing stability conditions, manmade and natural controls on lateral and vertical channel adjustment, assess sources of sediment supply to the project reach, and collect bed and bank material sediment samples for use in the detailed channel stability analysis. The field reconnaissance is anticipated to require approximately 4 days of field time for a 2-person crew. During the field reconnaissance, the crew will identify and document the following:

   a. Typical dimensions and shape of the bankfull channel,
   b. Presence of active geomorphic floodplains and terraces that would limit the width of the corridor over which the channel can laterally migrate,
   c. Condition and character of riparian vegetation and its potential effect on channel capacity and lateral stability.
   d. Other factors that affect hydraulic roughness, particularly at high flows,
   e. Existing lateral erosion areas,
   f. Evidence of recent and active degradation (i.e., channel downcutting),
   g. Manmade and natural erosion controls, including:

      i. bedrock outcrop and other natural erosion-resistant materials in the bed and banks,
      ii. infrastructure that either crosses or parallels the creek near the existing banklines,
      iii. existing vegetation that affects lateral stability

   h. Bed and bank material characteristics, including collection the following samples:

      i. up 5 to 10 pebble counts of the surface bed material in the cobble/gravel-bed reaches,
      ii. up to 5 grab samples of the subsurface bed material in areas of with an active, armored surface,
      iii. up to 5 grab samples of the surface bed material in sand-bed reaches,
      iv. up to 5 grab samples of the bank material.

Tetra Tech, Inc. (formerly Mussetter Engineering, Inc.)
3801 Automation Way, Suite 100, Fort Collins, CO 80525
Tel 970.223.9600 Fax 970.223.7171 www.tetratech.com

TETRA TECH

i. If the new 2-foot contour mapping is available at the time of the field reconnaissance, the need for additional, detailed cross sections at representative locations for use in the hydraulic model (see Task 3, below).

The grab samples will be delivered to a local soils laboratory in the Albuquerque area for gradation analysis.

It is assumed that ESCAFCA and Wilson will assist Tetra Tech in obtaining the necessary property owner permission to traverse the project reach, and that the analysis will rely on only the available aerial photograph and mapping in areas for which access permission cannot be obtained. It is recognized that the field mapping is a key element of the study; thus, the extent of the information used in the analysis, and the conclusions drawn from it, will be limited in any areas that cannot be accessed in the field.

3. Develop and apply a HEC-RAS hydraulic model the project reach using the available topographic mapping (see Task 1.b. above). Because specific data with which to calibrate the model are not available, a sensitivity analysis of the effects of error in selection of the channel roughness (Manning's n) values will be made, particularly as it would affect the flood carrying capacity of the channel in key areas where property improvements could be affected. The model will then be applied for the range of flows encompassed by the existing- and developed-conditions 100-year hydrograph. Hydraulic conditions for low to intermediate discharges will be used for the sediment transport and channel stability analysis, and the flood peak flows for both existing and future conditions hydrology, focusing on the 100-year event, will be used to assess flood potential along the reach.

4. Perform a channel stability analysis of the project reach to quantify the potential for vertical adjustment under both existing and future conditions hydrology and watershed conditions. This will include an incipient motion and armoring analysis in the cobble/gravel bed reaches and a sediment continuity analysis to quantify the relative sediment balance along the reach in the cobble/gravel bed reaches that are mobile under intermediate-level (5- to 10-year recurrence interval) flood flows and throughout the sand bed reaches. The effect of manmade controls, including infrastructure crossings that provide grade control and affect hydraulic continuity will be a key factor in this analysis. For purposes of this proposal, it is assumed that areas of vertical instability, if it occurs, and lateral erosion will primarily occur in the portion of the reach between the upstream boundary of the Placitas Open Space and Tecolote Road (~3.6 miles).

5. Using the information from the above tasks, identify the need for future grade controls, the potential for lateral migration under both existing and future conditions hydrology and watershed conditions, delineate a recommended

Tetra Tech, Inc. (formerly Mussetter Engineering, Inc.)

3801 Automation Way, Suite 100, Fort Collins, CO 80525

Tel 970.223.9600 Fax 970.223.7171 www.tetratech.com

TETRA TECH

Prudent Line outside of which there would be a low probability of damage due to flooding or lateral channel erosion due to a 100-year flood event that could occur at any time within the next 30 years, and if necessary, recommend bank protection in areas where lateral erosion could adversely affect existing infrastructure.

6. Prepare a technical report describing the methods, assumptions, findings and recommendations from the work.

7. Participate in up to three 1-day meetings in the Albuquerque area and up to five 2-hour telephone conferences.

Pipeline Meeting Minutes –August 17, 2009

(Meeting was organized by Carol Parker, who could not attend for medical reasons. Bill Patterson hosted the meeting at his house, 01 Arcoiris Road, Placitas, NM)

Attendees (list may not include everyone):
Bill Patterson, Host, Placitas Resident, Cedar Creek Homeowners Assoc., 867-2999
Dan Dennison, ESCAFCA, Placitas, Cedar Creek HA, 771-2211
Several Homeowners from Cedar Creek HOA
Sal Reyes, ESCAFCA, Algodones, 553-2565
Larry Blair, ESCAFCA, 249-1035
John Pepper, USDOT Office of Pipeline Safety, Houston, TX, 713-272-2849
Bruno Carrera, NM Pipeline Safety Bureau
Neal Schafer, NM Environment Dept., Surface Water Quality Bureau, 505-476-3017
Reid Bandeen, Hydrologist Consultant, Las Placitas Assoc., Author of WRAS Report
Matt Schmader, Albuquerque Open Space Division
Scott Muston, Kinder Morgan, Houston, TX, 432-688-2334
John Salas, Kinder Morgan, Cortez, CO
Steve Brown, Kinder Morgan, Bernalillo, NM
Robert Morris, Enterprise
Mike Johnson, Enterprise
Chuck Lee, Enterprise
Dennis Andrews, Enterprise, 713-381-7507

Situation:

1. Cedar Creek Homeowners Association members are concerned that gas and petroleum lines along and in Las Huertas Creek are vulnerable to erosion, exposure, and possible failure, especially during flood events.
2. Several lines are in the corridor: (list may not be accurate).
   a. 30-inch CO2 line, approx. 2100 psi; owner Kinder Morgan
   b. 2-12 inch natural gas liquid lines, 1650psi; owner Enterprise
   c. 1-8 inch refined product line (gasoline, diesel, etc); owner Enterprise
   d. 1-6 inch natural gas line(?); tar covered, not in service; owner NM Gas Company
   e. 1-Unknown size, not in service; owner Giant(?)
   f. 1 unknown size; owner Shell (?)
3. Some lines have been in place for decades.
4. Erosion and exposure has occurred in the past; no breaks have occurred; remedial measures have included gabion basket bank armoring and articulated concrete mats.
5. Pipeline companies are self-insured.
6. Lines are monitored for pressure drop. Kinder Morgan does an aerial inspection every two weeks. Problems are investigated within minutes or hours.
7. Storm events occur with little warning. Two large events are within recent memory: a 1990 storm which Bill Patterson estimated at 8000-cfs near his house; and a 2006 storm which washed out roads crossings and exposed pipelines.
8. Homebuilding along Las Huertas Creek started 20+ years ago, and has been accelerating in recent years. Several (many?) properties are on or adjacent to the pipeline ROW.

Suggested Remedies:

1. Worry
2. Have meetings
3. Buy insurance (?)
4. Relocate lines
5. More and better protection over the lines
6. Conduct an engineering analysis to determine potential problems and solutions.

Course of Action:

1. ESCAFCA Chairman Sal Reyes stated that because Las Huertas Creek is a major watershed in ESCAFCA's jurisdiction, it is appropriate for ESCAFCA to take the lead in addressing the situation.
2. ESCAFCA has just initiated an engineering study, called "Las Huertas Creek Prudent Line Study". This study will predict, with some certainty, how the creek will behave over a 30-year time span of "typical" storm events, and a one-percent (100-year) storm event. Results will include expected lateral bank erosion, scour and deposition, and other elements. The effects of existing structures, both natural and man-made, are taken into account, as well as the nature of flood flows and geologic and soil conditions. Included in the final product will be lines on each side of the creek showing predicted lateral erosion; "hard points" which are resistant to erosion; locations and estimates of scour and deposition; and proposed structural or other solutions, should present or future development warrant. The pipeline corridor will be a necessary part of the analysis and study. The limits of the study are expected to be from Camino de Tecolote downstream to the Albuquerque Open Space. Time frame for completion of the study is about one year, or winter 2010.
3. Chairman Reyes also called for the creation of a Work Force Committee, with the following tasks:
   A. Work together and with property owners to identify concerns
   B. Collaborate with ESCAFCA on its study.
   C. Assist in public input
   D. Consider and recommend appropriate actions.
4. The committee appointed is:
   - Dan Dennison, ESCAFCA and resident, Work force Chairman and Coordinator
     505-771-2211 dtdan@swcp.com
   - Carol Parker, resident
     505-867-0778 cmparker822@gmail.com
   - Bill Patterson, resident
     505-867-2999 legalecon@msn.com
   - John Pepper, USDOT Office of Pipeline Safety
     713-272-2849 John.Pepper@dot.gov
   - Neal Schaeffer, NMED Surface Water Quality Bureau
     505-476-3017 neal.schaeffer@state.nm.us
   - Scott Muston, Kinder Morgan
     432-688-2334 scott_muston@kindermorgan.com
   - Dennis Andrews, Enterprise
     713-381-7507 dandrews@epco.com

Submitted by: Larry A. Blair, Executive Engineer, ESCAFCA
505-821-1386 blairylar@hotmail.com

EASTERN SANDOVAL COUNTY ARROYO FLOOD CONTROL AUTHORITY
TASK ORDER NO. 12

Master Contract No. Engineering On Call Approval Date 12-07-09

1. Engineer: Daniel S. Aguirre, P.E.

2. Project Title: Pipeline and Hazardous Material Safety Administration Grant Assistance

3. Project Description: Preparation and Submission of the Pipeline and Hazardous Material Safety Administration Grant for the Pipeline located within the Las Huertas Creek area.

4. Location: ESCAFCA Jurisdiction

   Maps attached Yes _____ No X

5. Scope of Services Required: Services to preparation of the Grant.

6. Cost/Fee _____ Lump Sum _____ T&M NTE $ 5,913.72

7. Additional Attachments Man Hour Fee Schedule
   Scope of Work _____ Time Schedule 4 weeks Manhours & Fees _____

_____ Date 12/9/09
ESCAFCA Chairman

_____ Date 12/8/2009
ESCAFCA Executive Director

_____ Operations Manager Date 12/7/09
Engineer/Title

t:\pc\escafca\taskordr

Fee Proposal Task Order No.12

Pipeline and Hazardous Material Safety Administration Grant Assistance

WILSON & COMPANY, INC.
2600 The American Rd, SE; Suite 100
Rio Rancho, NM 87124

CLIENT: ESCAFCA
PROJECT NUMBER: Task Order No. 12

PREPARED BY: Steve Salazar, PE
PHONE: 505-898-8021
FAX: 505-898-8501
EMAIL: dsaguirre@wilsonco.com; slsalazar@wilsonco.com

OH = 166.5%
NEGOTIATED FEE = 12%

WORK CLASSIFICATION	DIRECT LABOR	OVERHEAD	FEE	FULLY LOADED RATE	MAN HOURS		PROJECTED COST
Chief Engineer	$53.27	$0.00	$88.69	$141.96	2		$283.93
Lead Project Manager	$45.22	$75.29	$14.46	$134.97	4		$539.89
Project Engineer	$37.52	$62.47	$12.00	$111.99	20		$2,239.79
Sr. Clerk	$15.00	$24.98	$4.80	$44.77	70		$3,134.04
						SUM =	$5,913.72

SUBCONSULTANTS

N/A							$0.00
						SUM =	$0.00

DIRECT EXPENSES

Mileage	per mile	estimated mileage =	0	$0.590		$0.00
Printing and Plotting		Estimated not to exceed		$0		$0.00
Misc.				$0		$0.00
					SUM =	$0.00

GRAND TOTAL = $5,913.72

Fee Proposal Task Order No.12

Pipeline and Hazardous Material Safety Administration Grant Assistance

WILSON & COMPANY, INC.
2500 The American Rd, SE; Suite 100
Rio Rancho, NM 87124

PREPARED BY: Steve Salazar, PE
PHONE: 505-898-8021
FAX: 505-898-8501
EMAIL: dsaguime@wilsonco.com; sjsalazar@wilsonco.com

CLIENT: ESCAFCA
PROJECT NUMBER: Task Order No. 12

OH = 166.5%
NEGOTIATED FEE = 12%

WORK TASK	Chief Engineer	Lead Project Manager	Project Engineer	Sr. Clerk	Summary by Task
1. Coordination Grant with ESCAFCA Executive Engineer			10	16	26
2. Prepare Grant Application Package	2	4	10	54	68
3. Grant Submittal					
Summary by Class	2	4	20	70	94

WORK TASK	DETAILED DESCRIPTION OF WORK TASK ACTIVITIES
1. Coordination w/ Design Team	Coordination of grant format and grant items with Executive Engineer
2. Prepare Grant Application Package	Prepare all grant requirements and application
3. Grant Submittal	Grant Submittal to be done by Jan. 2, 2010

GRANT AGREEMENT

BETWEEN

EASTERN SANDOVAL COUNTY ARROYO FLOOD CONTROL AUTHORITY
7309 Luella Anne Drive, NE
Albuquerque, NM 87109

AND

THE U.S. DEPARTMENT OF TRANSPORTATION
PIPELINE AND HAZARDOUS MATERIALS SAFETY ADMINISTRATION
1200 New Jersey Avenue, SE, E22-229
Washington, D.C. 20590-0001

CONCERNING

"Technical Assistance Grants Program"

Agreement No.: DTPH56-10-G-PHPT03

Total Amount of the Grant Agreement: $50,000.00

Government Funds Obligated: $50,000.00

PHMSA Line of Appropriation:
5172A10DA0/2010/50D0201000/PSGRT03030/41050 $50,000.00 PR# 956-10-6028

Authority: This agreement is entered into between the United States of America, represented by the U.S. Department of Transportation (DOT), Pipeline and Hazardous Materials Safety Administration (PHMSA), and the Eastern Sandoval County Arroyo Flood Control Authority pursuant to and under the Pipeline Inspection, Protection, Enforcement, and Safety Act of 2006, Section 5, codified at 49 U.S.C. §60130, Technical Assistance Grants (TAG) Program.

EASTERN SANDOVAL COUNTY ARROYO FLOOD CONTROL AUTHORITY

Signature

Larry A Blair, Executive Engineer
Name and Title

04 October 2010
Date

U.S. DEPARTMENT OF TRANSPORTATION
PIPELINE AND HAZARDOUS MATERIALS
SAFETY ADMINISTRATION (PHMSA)

Signature Warren D. Osterberg
Contracting Officer

SEP 24 2010
Date

SEP 30 2010
Effective Date

EASTERN SANDOVAL COUNTY ARROYO FLOOD CONTROL AUTHORITY
TASK ORDER NO. 15

Master Contract No. Engineering On Call Approval Date 10-19-10

1. Engineer: Daniel S. Aguirre, P.E.
2. Project Title: Pipeline Grant Administration
3. Project Description: Professional Services as requested by ESCAFCA Director and Board of Directors to include tasks as described in Attachment A Scope of Services.
4. Location: ESCAFCA Jurisdiction
   Maps attached Yes _____ No X
5. Scope of Services Required: As per Attachment A Scope of Services
6. Cost/Fee _____ Lump Sum _____ T&M NTE $50,000.00 (excluding NMGRT)
7. Additional Attachments Attachment A Scope of Services
   Scope of Work Attachment A Time Schedule FY 2011
   Man Hours & Fees Fees based on on-call hourly rates per time as requested by the Executive Director or Board of Directors (per Wilson & Company Rate Schedule)

ESCAFCA Chairman Date 10-19-10

ESCAFCA Executive Director Date 10/19/2010

Engineer/Title Date 10/18/10

t:\pc\escafca\tskordr

Item 19
4 pages

ATTACHMENT A – SCOPE OF SERVICES

TASK ORDER 15

Wilson & Company, Inc., Engineers & Architects shall provide ESCAFCA Board and Executive Engineer with the following services as requested to administer the Pipeline Grant on a Time and Materials basis, not to exceed $50,000.

1. October 2010:
   A. Print and distribute 40 copies of Prudent Line Study.
   B. Assist in clarification of allowable activities and provide request for time extension.

2. November/December 2010:
   A. Prepare exhibits and documents for two public meetings to be held in Placitas.
   B. Create a working committee/task group and meet regularly with group.
   C. Coordinate with pipeline companies to obtain as-built information and arrange for potholing of lines.
      a. Determine property rights and obtain right of entry for potholing
      b. Pothole lines at several locations in creek reaches 7, 8 and 9 (as identified in Prudent Line Report).
   D. Assist with coordination with other regulatory agencies as necessary.
   F. Provide additional detailed scour analysis as an addition to Prudent Line Report.
   G. Prepare report with recommendations/action plan.
   H. Assist with notification of residents along Las Huertas of activities throughout development of recommendations.
   I. Assist with the preparation of reports for submittal and reimbursement requests to granting agency

3. January 2011:
   A. Final Recommended Action Report
      a. Submit to task group, regulatory agencies, and pipeline companies for comment.
   B. Prepare conceptual designs
   C. Prepare and hold Public Information Meeting
   D. Revise/prepare designs to 30% stage
   E. Coordinate/negotiate with ESCAFCA Board, Sandoval County, pipeline companies and regulatory agencies regarding cost of solutions, as necessary.
   F. Prepare agreements as requested
   G. Submit reports and reimbursement requests as requested

4. Feb-Jun 2011
   A. Assist with construction documents for installation of structures and/or assist with implementation of other improvement programs as requested.
   B. Assist with preparation and submittal of final reports to granting agency

Wilson & Company
Rate Schedule Listing

GJ--2008-2009 NM/CO Municipal Rate Schedule			
Classification and Name		Reg. Rate	O/T Rate
FC1	CONSTRUCTION OBSERVER	$ 58.00	$ 87.00
FC2	CONSTRUCTION OBSERVER	$ 62.00	$ 93.00
FC3	CONSTRUCTION OBSERVER	$ 66.00	$ 99.00
FC4	CONSTRUCTION OBSERVER	$ 75.00	$ 112.50
FC5	CONSTRUCTION OBSERVER	$ 97.00	$ 97.00
FC7	CONSTRUCTION OBSERVER	$ 150.00	$ 150.00
FS1	CHAINMAN	$ 30.00	$ 45.00
FS2	RODMAN	$ 38.17	$ 57.26
FS3	INSTRUMENTMAN	$ 51.69	$ 77.54
FS4	PARTY CHIEF	$ 67.67	$ 101.51
FS5	CHIEF SURVEYOR, FIELD SUPERVISOR	$ 93.50	$ 93.50
FS6	DEPARTMENT HEAD	$ 119.37	$ 119.37
FS7	SR DEPARTMENT MANAGER	$ 125.00	$ 125.00
IA1	INTERN	$ 42.00	$ 63.00
OA1	APPREN WP OPER, CLERK, TYPIST	$ 35.00	$ 52.50
OA2	WP OPERATOR, CLERK, TYPIST	$ 40.00	$ 60.00
OA3	SR OPER, CLERK, SEC, LIBRARIAN	$ 42.00	$ 63.00
OA4	ASSIS ACCOUNTANT, SR SECRETARY	$ 52.00	$ 78.00
OA5	SECTION HEAD	$ 82.00	$ 82.00
OD1	APPRENTICE DRAFTER	$ 42.00	$ 63.00
OD2	DRAFTER, TRACER, PLOTTER OPERAT	$ 48.00	$ 72.00
OD3	DRAFTER, DETAILER	$ 58.00	$ 67.50
OD4	SR DRAFT, DETAIL, CAD OP, TYPIST	$ 70.00	$ 105.00
OD5	SR DRAFT, DETAIL, SQUAD LEADER	$ 85.00	$ 127.50
OD6	CHIEF DRAFTER	$ 95.00	$ 142.50
OP1	APPRENTICE STEREO OPERATOR	$ 40.30	$ 60.45
OP2	STEREO OPERATOR	$ 46.50	$ 69.75
OP3	STEREO OPERATOR	$ 55.80	$ 83.70
OP4	SR STEREO OPER, SQUAD LEADER	$ 76.03	$ 114.05
OP5	PHOTOGRAMMETRIST, SUPERVISOR	$ 86.41	$ 86.41
OP6	CHIEF PHOTOGRAM, DEPARTMENT HE	$ 120.00	$ 120.00
OP7	CHIEF PHOTOGRAM	$ 180.00	$ 180.00
OT1	APPRENTICE, TECHNICIAN, OPERATOR	$ 27.00	$ 40.50
OT2	TECHNICIAN, OPERATOR	$ 32.00	$ 48.00
OT3	TECHNICIAN, OPERATOR	$ 38.00	$ 57.00
OT4	SR TECH, OPER, SQUAD LEADER	$ 48.00	$ 72.00
OT5	SECTION HEAD	$ 58.00	$ 58.00
P1	GRAD ENG/ARCH IN RES (UNLIC)	$ 77.00	$ 77.00
P2	GRAD ENG/ARCH IN RES (UNLIC)	$ 80.00	$ 80.00
P3	STAFF DETAIL DESIGNER (UNLIC)	$ 95.00	$ 95.00
P4	STAFF DETAIL DESIGNER (LICENSED)	$ 112.00	$ 112.00
P5	PROJECT DESIGNER (LICENSED)	$ 135.00	$ 135.00
P6	PROJECT DESIGNER (LICENSED)	$ 158.00	$ 158.00
P7	DEPARTMENT HEAD, PRINCIPALS, (LIC	$ 160.00	$ 160.00
P8	PRINCIPALS (LICENSED)	$ 180.00	$ 180.00
PA1	JR PLANNER, PHYSICIST (GRAD)	$ 48.00	$ 72.00
PA2	ASSIST PLANNER, PHYS (GRAD)	$ 58.00	$ 87.00
PA3	ASSOC PLANNER, PHYS (GRAD)	$ 68.00	$ 102.00
PA4	SENIOR PLANNER, PHYS (GRAD)	$ 78.00	$ 78.00
PA5	DEPARTMENT HEAD (GRAD)	$ 98.00	$ 98.00
PA6	PA6	$ 120.00	$ 120.00
PA7	PA7	$ 135.00	$ 135.00
PD1	DETAIL DESIGNER (UNLICENSED)	$ 64.00	$ 96.00
PD2	SENIOR DETAIL DESIGNER (UNLICENSE	$ 76.00	$ 114.00
PD3	SENIOR DESIGNER II	$ 90.00	$ 135.00
PD4	SENIOR DESIGNER III	$ 100.00	$ 100.00
PD5	SENIOR DESIGNER IV	$ 122.00	$ 122.00

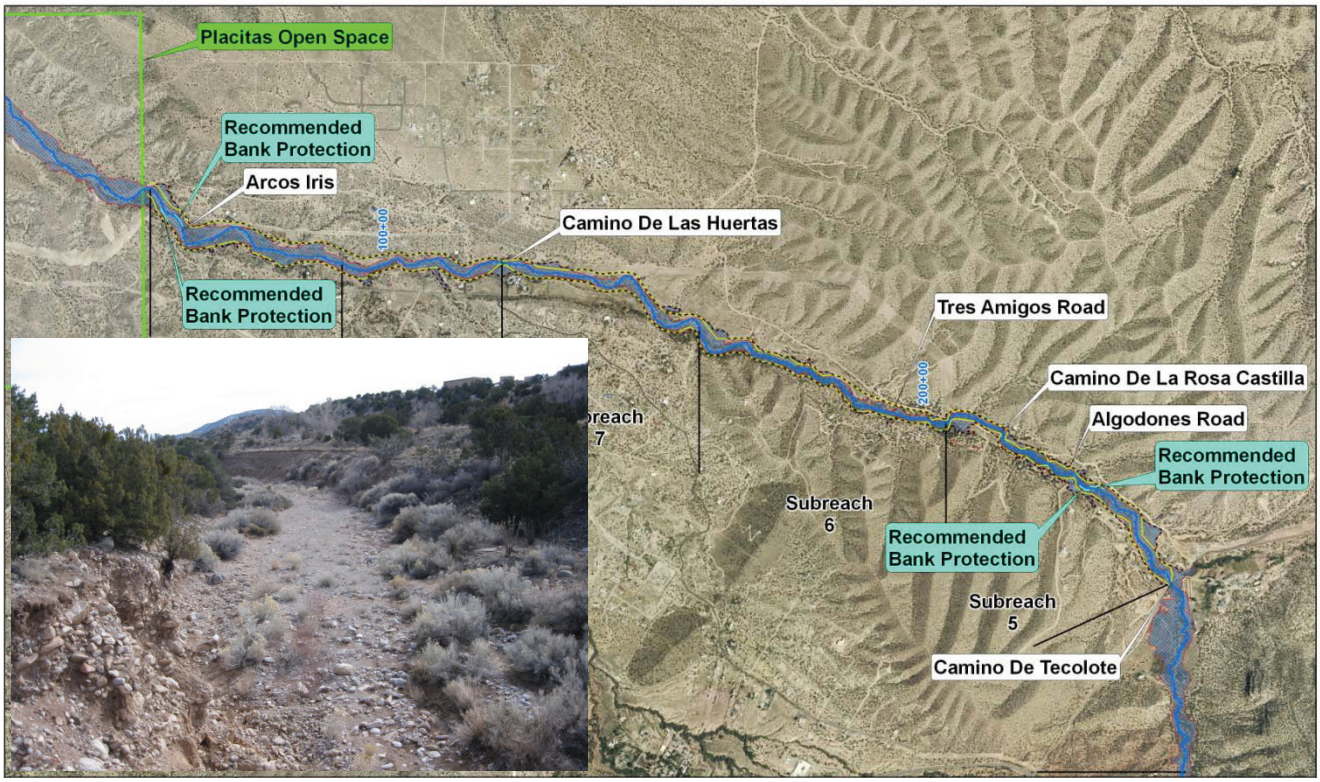
Unit Pricing - Schedule GJ

a	**Subsistance**	
	Subsistance for employees and direct field expenses.....	At Cost
b	**Transportation** (employee's time and subsistence are charged in addition to the following rates)	
	Company Automobile	
	Passenger Vehicle.....	0.59/mi.
	Fuel Surcharge.....	0.10/mi.
	Survey Vehicle.....	0.75/mi.
	Fuel Surcharge	0.10/mi.
	Commercial Transportation.....	At Cost
c	**Materials**	
	All materials, other than normal office supplies, which are used in connection with the rendering of services.....	At Cost
d	**Computer-Aided Design Drafting** (employee's time is charged in addition to the following rate)	
	Use of the interactive CADD System, when used in the rendering of services	$ 0.00/hr.
e	**Subcontract Services**	
	Geotechnical, special environmental services, O&M Manuals and other Subcontracted services.....	At cost plus 10%
f	**Equipment Rental**	
	Outside Charges.....	Commercial Rates plus 10%
	Printing, reproduction and photographic work	
	Outside Charges.....	Commercial Rates plus 10%
	In-House Charges:	
	Copies - 8.5 X 11.....	0.10/copy
	Copies - 11 X 17.....	0.20/copy
	DVD.....	10.00 ea
	Black/White Wide Format Prints	0.25/sq ft
	Black/White Wide Format Prints - Mylar	2.00/sq ft
	Color Wide Format Prints	0.75/sq ft
	Environmental and chemical laboratory work	
	Charges.....	Commercial Rates plus 10%
	Global Positioning System (GPS)	
	Charges.....	$125/unit/day
	Nuclear Densometer	
	Charges.....	$100/unit/day
g	**Delivery Services**.....	At Cost plus 10%

Billing Policy and Credit Terms

Our billing will be prepared each billing period following any billing period in which services have been rendered. Payments are to be made within 30 days from the date of our invoice. Each of our billing periods is four weeks in duration. We reserve the right on past due accounts to suspend all services and levy an additional percentage charge per billing period until payment is received.

Channel Stability Analysis and Prudent Line Assessment for Las Huertas Creek, Sandoval County, New Mexico



Submitted to:

Wilson & Company, Inc.,
Engineers and Architects
2600 The American Road SE
Rio Rancho, NM 87124

Submitted by:

TETRA TECH
3801 Automation Way, Suite 100
Fort Collins, CO 80525

October 15, 2010

Reference 11

Join Us

ESCAFCA
Eastern Sandoval County Arroyo Flood Control Authority

Prudent Line & Pipeline Safety Briefing

Thursday, Dec. 16, 2010, 7 to 9 p.m.
Placitas Community Center

Cancelled - Snow

www.escafca.com for more information

Join Us

Las Huertas Creek Prudent Line & Pipeline Safety Informational Sessions

Tuesday, January 11th

(This is the first scheduled meeting, the December meeting was cancelled due to snow.)

Wednesday, January 26th &
Tuesday, February 22nd

all meetings from 7 to 9 p.m. at the Placitas Community Center

We will receive community feedback and suggestions and
answer technical questions about methodology used.
Representatives from the pipeline companies and regulatory agencies have been invited.

ESCAFCA
Eastern Sandoval County Arroyo Flood Control Authority

www.escafca.com for more information

ESCAFCA
Eastern Sandoval County Arroyo Flood Control Authority

Las Huertas Creek Prudent Line/ Pipeline Safety Public Meeting Minutes

Meeting Location: Placitas Community Center
Date & Time: January 11, 2011, 7:00 p.m.

The public meeting commenced at 7:00 p.m. as Larry Blair provided in-depth information on the history of the Las Huertas Prudent Line Study and how it related to the Pipeline Safety Project. Each section of the "*Channel Stability Analysis and Prudent Line Assessment for Las Huertas Creek*" Draft Report (prepared by Tetra Tech, Oct. 15, 2010) was reviewed with those in attendance.

Concerns and questions from those in attendance are included below.

- Based on regulations, how deep are the pipelines supposed to be buried?
  - Larry indicated that depth of bury was based on many factors; soil conditions, velocities in the channel, etc.
  - Pipeline operators will be invited to attend the next public meeting to answer questions about regulations.

- One resident stated that some work to protect a pipeline had recently been completed near Windmill Trail.

- An attendee questioned how completed and on-going studies would affect agreements between various public entities in the area.

- A local resident suggested that additional focus be made on identified channel reaches 6, 7, and 8. The channel along several portions of these sub-reaches has already eroded to underlying bedrock layers.

- Larry closed out the meeting indicating that additional information, comments and questions could be emailed to him after the meeting.

A copy of the meeting sign-in sheet is attached.

ESCAFCA Pipeline Meeting Sign In-Sheet

Jan 11, 2010

Name	Email	Phone #
Susan Arreola		
[illegible]		
Reid Bandeen	RBandeen@aol.com	867-5477
Stephen Barro		
Bill Kreeker		
Linda Socha		
Bala Orban		
D Neuman	dpneuman@openit.com	

ESCAFCA
Eastern Sandoval County Arroyo Flood Control Authority

LAS HUERTAS CREEK PRUDENT LINE/ PIPELINE SAFETY PUBLIC MEETING

January 26, 2011
7:00 p.m.

Sally Arroyo
NM PRC Pipeline Regulation
505 231-5204

I. **Welcome and Introductions** (Larry Blair)
- SIGN-IN SHEET (FOR RECORD KEEPING)

II. **Prudent Line & Pipeline Safety Briefing** (Larry Blair)

A. Project Background

B. Pipeline Safety Conference Presentation

C. Questions and Comments

III. **Channel Stability Analysis and Prudent Line Assessment** (Bob Mussetter)

A. Summary of analysis / methodology

B. Summary of findings

C. Questions and Comments

Joe Rice
NM Gas Company
798-3397

IV. **Pipeline Owner Comments**

A. Questions and Comments

V. **Work Plan Details** (Larry Blair)

A. Next Steps

B. Upcoming Meetings

VI. **Open Forum for Additional Questions and Comments**

VII. **Closing Remarks** (Larry Blair)

Tues 22 Feb

ESCAFCA
Eastern Sandoval County Arroyo Flood Control Authority

Las Huertas Creek Prudent Line/ Pipeline Safety Public Meeting Minutes

Meeting Location: Placitas Community Center
Date & Time: January 26, 2011, 7:00 p.m.

The public meeting commenced at 7:00 p.m. as Larry Blair provided a brief summary of the purpose of the Las Huertas Prudent Line Study and how it relates to the Pipeline Safety Project. Larry then made a brief presentation similar to the presentation made at the Pipeline Safety Conference.

After the presentation, the meeting was open to questions from the public. Questions and comments are included below.

- Are pipeline companies required to provide protection for pipes within or near an arroyo?
  - Sefie Anaya, a Representative from the local Public Regulations Commission (PRC) office, indicated that pipeline companies were responsible for protecting pipelines as well as public and private property where pipelines existed.

- Why are pipeline companies not protecting the pipelines even with the knowledge that they are being exposed?
  - Sefie indicated that ownership of the lines changes periodically so there may be a delay in inspection of lines. He also indicated that several companies, including Kinder-Morgan have made efforts to disseminate information on the location of pipelines to residents in Placitas. The PRC also conducts periodic audits of documentation and encourages pipeline companies to attend public meetings and address public concerns.
  - Carol Parker a local resident (a local pipeline safety program advocate) indicated that no true regulations exist requiring companies to "maintain" cover over pipelines. The regulations are specifically for bury depth at installation.

Bob Mussetter, Tetra Tech, presented a brief summary of the analysis completed for the "*Channel Stability Analysis and Prudent Line Assessment for Las Huertas Creek*". He provided information on the impacts local development has on the Las Huertas Creek and how the impacts could be minimized. The meeting was then opened to further public comment and questions.

- Comment from resident: More regulations need to be imposed on pipeline companies to require them to take more responsibility for protecting their lines.
  - Larry indicated that the Tetra Tech Report had been provided to pipeline companies (NM Gas Company, Kinder-Morgan, Enterprise Gas, and Western

Refining) with facilities in the Las Huertas Creek area; to the PRC; and PHMSA.
    - Carol indicated that passing stronger regulations may not be easy to achieve due to the increased operating costs that would be passed onto customers.

- Reid Bandeen, a Placitas resident, indicated that locals were frustrated because they didn't know who to contact to voice concerns or obtain information. He also indicated that most residents were very interested in low impact protection measures that would maintain the natural habitat along Las Huertas Creek.

- Carol stated that a pipeline break could result in contamination of the area that would impact groundwater used to recharge the local aquifer.

Each of the pipeline companies were formally invited to attend the public meeting to address comments, however, no representatives attended the meeting.

Larry provided attendees details of the work plan for completing the project. He indicated that a series of public meetings were a critical step in completing the requirements of the grant to ESCAFCA. Next, he would be contacting each of the pipeline companies to complete more in-depth surveys of the existing facilities to better identify their horizontal and vertical locations. This would assist in the development of solutions to better protect the existing facilities.

Discussions in the meeting were then focused on the material presented in the Tetra Tech report and the clarifications and changes to be made to the report.

Larry closed out the meeting indicating that additional information, comments and questions could be emailed to him after the meeting. Public comment forms were also made available to the attendees and could be downloaded from the ESCAFCA website.

A copy of the meeting sign-in sheet is attached.

ESCAFCA
Eastern Sandoval County Arroyo Flood Control Authority

SIGN-IN SHEET

LAS HUERTAS CREEK PRUDENT LINE
PIPELINE SAFETY
PUBLIC MEETING

January 26, 2011
7:00 p.m.

NAME	AGENCY	PHONE/FAX	EMAIL
Carl Parker	Self	505-259-1827	cmparker822@gmail.com
Sefie Anaya	Public Regulation Commission	505-231-5604	sefie.anaya@state.nm.us
Reid Bandeen	self	505-867-5477	RBandeen@aol.com
Neal Schaffer	NMED	505-476-3017	neal.schaffer@state.nm.us
COSMOS	CITIZEN	505-217-9384	zhdehner@yahoo.com
JOAN LUCERO	Citizen	(505) 867-4563	JLUCERO317@AOL.COM
TONY LUCERO		11	11

LAS HUERTAS CREEK PRUDENT LINE/
PIPELINE SAFETY
PUBLIC MEETING

NAME	AGENCY	PHONE/FAX	EMAIL
Steve Salazar	WCI	878-8024	Steve.Salazar@wildernessci.com
Bob Gorrell	SELF	771-9464	rgorrell@comcast.net

NEW MEXICO
PRC
PUBLIC REGULATION COMMISSION

Safe Digging Month

April 28, 2011 at the Placitas Senior Center

41 Camino de Las Huertas, Placitas, NM

6 – 8:00 PM.

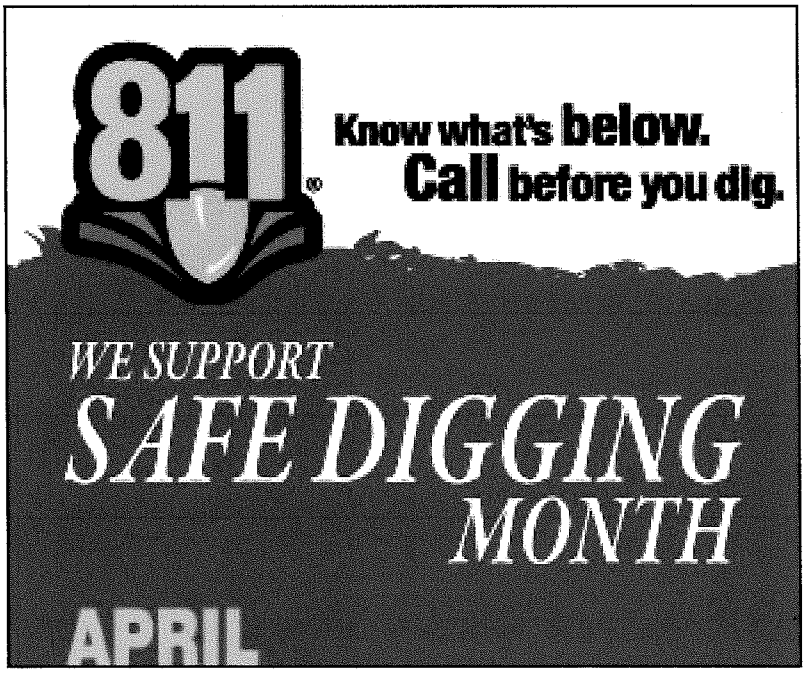
Sponsors:

ESCAFCA
Eastern Sandoval County Arroyo Flood Control Authority

nm811
Know what's below. Call before you dig.

KINDER MORGAN

Western Refining



Come attend a free seminar and learn about the pipelines companies operating in your area, and the safety and hazards associated with excavation.

Sponsors:

PNM

New Mexico GAS COMPANY

Enterprise Products

AGAVE ENERGY COMPANY

For more info call - Sefie Anaya (505) 231-5204 sefie.anaya@state.nm.us

NEW MEXICO
PRC
PUBLIC REGULATION COMMISSION

APRIL is Safe Digging Month

811

A FREE SEMINAR to learn about the pipeline companies operating in your area, and the safety and hazards associated with excavation.

April 28, 2011 at the Placitas Senior Center
41 Camino de Las Huertas, Placitas, NM
6 – 8:00 pm

SPONSORS

nm811 Know what's below. Call before you dig.

PNM

Western Refining

Agave Energy Company

KINDER MORGAN

New Mexico Gas Company

Enterprise Products

ESCAFCA Eastern Sandoval County Arroyo Flood Control Authority

For more information

Contact Sefie Anaya at (505) 231-5204 or sefie.anaya@state.nm.us

Other pipeline in Las Huertas ?
Buried standards vs Scour
36"

30" CO_2 line

CAB
4/20/2011

15 citizens
15 pipeline co
+ regulators
+ One Call

Agenda

- Welcome- Introductions – PRC
- PRC- Slide Show — Jerome Block
- ESCAFEA- Larry Blair
- NMOC (One Call)- Vic Newton — 400 employees state wide, funded by utilities
- NM Gas- James Stanovcak — no lines in creek; up to 6" service line to Placitas, in roads; 40 psi max; PE pipe; may be Xing at Tecolote Rd — Gary Roybal
- PNM Electric- Carlos Arras (Arias)
- Kinder Morgan-Steve Brown — from Cortez CO to Permian Basin; 30" CO2 line 2100 psi 1500 miles installed 1986; inspection once/week – air & ground; 1/2" high tensile steel; 100 yr life; 1" thick at river crossings
- Enterprise Mid-America- Robert North — Scott Muston, Midland TX; UCC Sub New ... Las Huertas '06
- Western Refining-Dave Richards — Ron Koppel — no lines in Las Huertas; all to north; 424 mi 16" crude oil Jal to Bisti, now idle, 1957, Tex-NuMex
- Question

Adjournment

Enterprise:

1. 12" Natural gas liquid 1980, 1600 psi, Ethane, Propane, Gasoline, Butane turn to vapor
2. 8" Gasoline, diesel, jet fuel, stay as liquid, 1972 — Artesia to Bloomfield
3. 12" 1995 Natural gas liquid

10-12 miles between valves, not all remotely operated

4/28/2011

The meeting convened at 6:20 p.m.

Sefie Anaya from the Public Regulation Commission opened. Introduced Jerome Block, commissioner, Jason Montoya, Bureau Chief, Miguel Lujan all from the PRC.

Intent is to know who to call if there's a problem with pipelines in their area. They've gone all over the state.

April is National Safe Digging Month. PRC focuses on enforcing laws and regulations and education of the public.

Sefie showed a slide show, which is available to anyone who wants it.

We've had no deaths or injuries due to excavation. NM excavation law is the toughest in the nation.

Excavation – definition is any time you move erth using any mechanical excavation equipment. You must call 811 if you excavate.

People who prepare engineering plans must call to prevent interference with utilities. There is a 12" tolerance zone. You have to start 18" from the utility.

Call 811. Know before you dig.

Larry Blair from ESCAFCA presented next:

People from Placitas had expressed concern about the pipelines and potential issues. In 2006, pipelines had been exposed during a storm.

ESCAFCA commissioned a study of Las Huertas Creek. The study predicts how Las Huertas will behave over a 30-year time period given typical storm events and with a 100-year storm event. The study is an engineering approach that determines how the Creek will behave. The study concluded that in some of the lower reaches (from Camino de las Huertas to Open Space) there is a potential that some of the gas lines could be exposed during a storm.

ESCAFCA applied to the feds in 2009 and got a grant to educate the public about the study and its findings.

Larry attended a national meeting in New Orleans and presented the methodology we used in our study. It was new. Usually the funding is for remdediation. Our engineering study was ground breaking. We're looking ahead to say what could happen and how could we prevent it. And how do we use engineering principles to do that.

Larry gave a presentation which is also available to anyone who wants it.

The prudent line is the line on either side of Las Huertas Creek where it would not be prudent to build.

The intent is that the information would be widely used by developers/home builders in the future. It's

intended to be a management tool to correct existing problems and prevent future ones.

Cement blankets don't always work.

Camino de las Huertas – has pipelines. There is a dip crossing is a great idea. Moves the water away from the culverts and lead the water out to the road. The problem here is right at the dip crossing – there is a 30-foot CO2 line which could get exposed in a major storm.

Further downstream we found other areas that could have potential problems. There is a side arroyo next to Las Huertas Creek – there are pipelines that could be potentially exposed.

A question was asked as to who's responsibility is it to maintain safety? The county, the pipelines, the homeowners?

Larry said he's not a pipeline regulator and cannot answer the question. He guesses that since they do remedy the problem when they see one. The PRC Bureau chief said the responsibility is both the responsibility of the flood control authority and the pipeline company.

The intent of the study was to preserve the natural state of the arroyo and prevent potential problems with exposure of the pipelines

Larry then showed different possible solutions

Oren Safier asked if there is a general pipeline map. PRC said you can get it on national pipeline mapping system. Pull up state, and then county. The map shows location and background on product carried.

Detail not available – due to 9-11 and protecting national security.

Each pipeline company is supposed to conduct public information sessions with the community.

Next speaker was Bureau Chief. He asked about recommendations of the study and question on design of protection for the pipelines.

Larry said the grant was to identify if there are any problems. And if there seemed to be, sit down with the pipeline companies to devise a plan. We can lend our expertise and they could bring their expertise.

We are not at the point for any design yet.

Bureau Chief reiterated that just because a pipeline is exposed it doesn't necessarily mean there's a problem nor danger.

Next speaker *Vic Newton* from NM One Call – The purpose of the one call – is to find out where you're going to dig – get the info to the utilities so they can mark their utilities for you.

Why? Keep everyone safe. Prevent damage to the utilities. It's the law.

You're required to call if you dig with any machinery (trenching for drip system) anything. Call 811 or go online to www.nmonecall.org

Must give two working days advance notice.
Next Speaker: NM Gas – *James Stanovcak* – from the compliance department

pipelines in Placitas are small – largest is 6" in diameter. They go down your roads and go to your homes and businesses. Some are as small as ½ inch in diameter. Very low pressure.

Most pipelines are plastic. Do regular maintenance and right of way patrol once a quarter. 24/7 monitoring room.

Most pipelines are underground in right of ways.

1-888-NM-GAS-CO if you suspect any leak

Next speaker – *Carlos Arilla* from PNM

Be sure when you're doing construction to look up for power lines as well

Any questions concerns call 888-342-5766. Don't trim trees that are growing into power lines. We'll trim the tree for you. Don't do it yourself.

When doing yard work, don't use netal handles. Even if you think there are no power lines there.

Next speaker – Kinder Morgan *Steve Brown* (CO2 company)

30" line runs through Placitas. CO2 runs from Cortez CO and then transport to West Texas for use in enhanced oil recovery.

1500 miles of pipeline monitored 24/7 out of Cortez CO

Meet with emergency responders once a year.

All pipelines are patrolled 26x per year by air. Placitas now gets patrolled once a week. What we're looking for is excavation and exposed lines. Oncee a year we fly over with a helicopter.

Bob Gorrell asked if there is an emergency disaster plan. Yes there is. All emergency responders have been trained.

Where would a citizen read that plan? You'd have to call the company.

We've spent over 2 million in the last five years to prevent erosion. Multiple repairs take place every year.

Question on has any disaster plan been planned for catastrophic earthquake in the area? Not specific to earthquakes, but the emergency plan prepares for catastrophic events. Pipelines can be shut off

remotely.

Larry Blair asked about the mats out there. Some are theirs and are some are Enterprise.

None have failed here to date.

Next speaker – Enterprise Mid-America *Robert North*

Multiple state pipeline system – transports products to Hobbs and TX

Pipelines are safer than transpoting via trucks.

Also have some natural gas lines

They pump liquids

It is highly flammable.

Also transport refined products – from Artesia to Moriarty and onto Bloomfield

Sandoval County has copy of emergency response plan.

Have done mock drills with both Sandoval County and Bernalillo.

Pipelines constructed in 1972, 1980, 2000 and 2006

Would we install a pipeline where there is population? Yes. The company would do a risk assessment of that pipeline before making that decision. If the risk is too high, they'd make other plans.

Has a risk assessment been done due to current population density? Yes. It is managed by our Integrity Management Program. Data is evaluated and make decisions accordingly.

8" 1972
10" to 12" 1980-
12" 2000
16" in 2006

hydrostatic tests – are done before pipelines are put in

Other tests every year

Smart pigs – now used regularly

1998 Williams owned Mid America pipeline and that was the who owned the pipe when the leak happened.

What is the capacity of these pipelines – gather from Wyoming and Colorado, then San Juan basin and

then onto Houston. 70 to 100 percent volume capacity

Houston is the hub of the oil and gas industry. Largest refraction plants, petro chemical plants. That's the main infrastructure. Shipped out to other pipelines or shipped to China. Global industry.

Do you plan on introducing any other products into the pipelines. No. They're permitted for what we have in them. If we want to pipe other products we'd have to go through a process with the state and the feds.
You can have more than one product in a line at a time.

Do you switch direction of the flow? No.

Next speaker – Western Refining *Dave Richards*

424 miles of pipeline crude oil

16" pipeline in placitas

through our risk assessment and integrity management we determined that valves needed to put in for safety

at this time the lines are idle

the line goes from jal nm to bisti nm near bloomfield

the pipeline is at a minimum of 36" below ground

aerial and drivers look at the pipeline

we fix exposures as they happen

the age of the pipeline is 1957 by tex/newmex pipeline

in 2006 we went through a thorough hydrostrating testing of the line and there were repairs done

the integrity management system is stringent. Can be done by smart pigging or hydrostatic testing. It must be done every 5 years.

The pipeline could go another 60 years if maintained properly

All pipelines that are in the area are here tonight.

U.S. Department of Transportation
Pipeline and Hazardous Materials
Safety Administration

1200 New Jersey Ave, S.E.
Washington, D.C. 20590

MAY 05 2011

Mr. Larry Blair
Sandoval County Arroyo Flood Control Authority
7309 Luella Anne Drive, NE
Albuquerque, NM 87109

Subject: **Executed Grant Agreement #DTPH56-10-G-PHPT03, Modification #0001**

Dear Mr. Blair:

Enclosed is one (1) executed copy of the above referenced modification for your files.

If you have any questions or concerns regarding this matter, please do not hesitate to contact Maria Muñoz at (202) 366-5513.

Sincerely,

Warren D. Osterberg
Contracting Officer

Enclosure:
#DTPH56-10-G-PHPT03, Modification #0001

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT

1. CONTRACT ID CODE	PAGE OF PAGES
	1 2

2. AMENDMENT/MODIFICATION NO.	3. EFFECTIVE DATE	4. REQUISITION/PURCHASE REQ. NO.	5. PROJECT NO. (If applicable)
0001	See Block 16C	See Schedule	

6. ISSUED BY	CODE	7. ADMINISTERED BY (If other than Item 6)	CODE
Office of Acquisition Services US DOT/PHMSA/PHA-30 1200 New Jersey Avenue, SE E22-305 Washington DC 20590-0001	PHA-30	Office of Acquisition Services US DOT/PHMSA/PHA-30 1200 New Jersey Avenue, SE E22-305 Washington DC 20590-0001	PHA-30

8. NAME AND ADDRESS OF CONTRACTOR (No., street, county, State and ZIP Code)

EASTERN SANDOVAL COUNTY ARROYO FLOOD CONTROL
Attn: Larry Blair
7309 Luella Anne Drive NE
Albuquerque NM 87109

CODE 832899350 FACILITY CODE

(x) 9A. AMENDMENT OF SOLICITATION NO.

9B. DATED (SEE ITEM 11)

X 10A. MODIFICATION OF CONTRACT/ORDER NO. DTPH56-10-G-PHPT03

10B. DATED (SEE ITEM 13) 09/24/2010

11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS

☐ The above numbered solicitation is amended as set forth in Item 14. The hour and date specified for receipt of Offers ☐ is extended, ☐ is not extended.
Offers must acknowledge receipt of this amendment prior to the hour and date specified in the solicitation or as amended, by one of the following methods: (a) By completing Items 8 and 15, and returning _____ copies of the amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGEMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter, provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.

12. ACCOUNTING AND APPROPRIATION DATA (If required)
See Schedule

13. THIS ITEM ONLY APPLIES TO MODIFICATION OF CONTRACTS/ORDERS. IT MODIFIES THE CONTRACT/ORDER NO. AS DESCRIBED IN ITEM 14.

CHECK ONE	
	A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: (Specify authority) THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. IN ITEM 10A.
	B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (such as changes in paying office, appropriation date, etc.) SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(b).
	C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF:
X	D. OTHER (Specify type of modification and authority) Mutual Agreement of the Parties.

E. IMPORTANT: Contractor ☐ is not, ☒ is required to sign this document and return 2 copies to the issuing office.

14. DESCRIPTION OF AMENDMENT/MODIFICATION (Organized by UCF section headings, including solicitation/contract subject matter where feasible.)

The purpose of Modification #0001 to Grant Agreement #DTPH56-10-G-PHPT03, is to extend the period of performance through September 30, 2011.

As a result of this modification, the total Federal Award amount remains unchanged at $50,000.00. The obligated amount remains unchanged at $50,000.00.

The submission due dates for the Final Report, and the Final Financial Status Report are extended as follows:

1) The Final Report submission due date is extended from June 1, 2011 to December 30, 2011

Continued ...

Except as provided herein, all terms and conditions of the document referenced in Item 9A or 10A, as heretofore changed, remains unchanged and in full force and effect.

15A. NAME AND TITLE OF SIGNER (Type or print)		16A. NAME AND TITLE OF CONTRACTING OFFICER (Type or print)	
LARRY A BLAIR EXECUTIVE ENGINEER		WARREN OSTERBERG	
15B. CONTRACTOR/OFFEROR (Signature of person authorized to sign)	15C. DATE SIGNED	16B. UNITED STATES OF AMERICA (Signature of Contracting Officer)	16C. DATE SIGNED
	05 MAY 2011		5/5/11

NSN 7540-01-152-8070
Previous edition unusable

STANDARD FORM 30 (REV. 10-83)
Prescribed by GSA
FAR (48 CFR) 53.243

NAME OF OFFEROR OR CONTRACTOR
EASTERN SANDOVAL COUNTY ARROYO FLOOD CONTROL AUTHORITY

ITEM NO. (A)	SUPPLIES/SERVICES (B)	QUANTITY (C)	UNIT (D)	UNIT PRICE (E)	AMOUNT (F)
	(See section 10.01 of the Basic Grant Agreement for additional details). 2) The Final Financial Status Report submission due date is extended from June 1, 2011 to December 30, 2011 (See section 10.02 of the Basic Grant Agreement for additional details). ALL OTHER TERMS AND CONDITIONS REMAIN UNCHANGED AND IN FULL EFFECT. -- Period of Performance: 09/30/2010 to 09/30/2011 Change Item 0001 to read as follows(amount shown is the obligated amount):				
0001	Obligated Amount. Obligated Amount: $0.00 Requisition No: 956-10-6028, 956-11-X0019 Accounting Info: 5172A10DA0/2010/50D0201000/PSGRT03030/41050 Funded: $0.00 Accounting Info: None Needed Non-Monetary Change. Funded: $0.00 ********** Points of Contact: ---------- Grant Officer's Technical Representative: Sam Hall, (804) 556-4678 Agreement Administrator: Maria Munoz, (202) 366-5513 Payment Office: Margaret Gorman, (405) 954-7468				0.00

Field notes from on-site inspection of Enterprise pipelines buried in, and crossing Las Huertas Creek (Arroyo) conducted on 29 July 2011 by Larry A Blair, ESCAPEM; Robert North, Enterprise; and Angela Valdez, Wilson + Co Engineers.

Inspection focused on Subreaches 8 and 9; deemed most vulnerable (see p 5.13; p 5p1C; pp 7.2 – 7.6)
Purpose was to determine depth of pipelines. Robert North did so with electronic locater.

Note: Attempts to conduct a similar inspection of the 30" CO_2 line belonging to Kinder Morgan have been notably unsuccessful.

Suggestions for Grade Control Structures (GCS) or bank protection are circled. They are independent of, but may be concurrent with, those recommend in the report (p 7.6)

Notes:

All depths to top of line

E = Enterprise

NGL = Natural Gas Line 2 – 12" installed 1950 and 1995

Product = Refined Petroleum Product installed 1972

K-M = Kinder Morgan 30" CO_2 line 2100 psi installed 1982

Site	Coordinates	Comments
121+10 1	N 35° 19' 54.9" W 106° 26' 30.1"	Camino de las Huertas Road Crossing (102+00) Enterprise 2 12" NGL lines 1 8" Refined product Kinder Morgan 30" CO_2 line all buried in southern approach to crossing, which is also the 'Sacrificial "washout" section of roadway. K-M 30" line likely to be first line exposed in overflow. Install buried grade control just downstream of road
2	N 35° 19' 54.6" W 106° 26' 35.3"	Articulated Mat in arroyo bottom 30' long; 20' wide 12" NGL north of mat; 36" deep 18" Product line under mat; 35" deep 12" NGL south of mat; 38" deep
115+80		3'x3'x60' gabions on south bank.
3	N 35° 19' 55'0" W 106° 26' 39' 0"	Arroyo bottom 3 E lines 35-36" deep
		Install gabions along south bank between (3) and (4)

4		3 Enterprise liner in south bank above arroyo bottom; 6 ft deep
104+70 5	N 35° 19' 55.5" W 106° 26' 47.0"	Natural Grade Control structure, 6 ft high (Conglomerate ?), with 150 ft of mats on south bank, downstream of Natural GC. Extend Natural GC structure with buried concrete each side
6		200 ft of mat along north bank - protects K-M 30" CO_2 line
100+00 ± 7	N 35° 19' 56.0" W 106° 26' 51.0"	Enterprise and K-M pipeline cross in arroyo bottom. Enterprise 12". NGL is under K-M 30" CO_2 line. Depth unknown, but likely 6' deep. Both lines are under 200 mat on north bank (see 6 above)
8		100 mat in arroyo bottom, covering K-M 30" CO_2 line. Depth unk
98+50		

62+90 9	N 35° 19' 56.5" W 106° 26' 59.5"	Confluence of las Huertas Arroyo and Orno. Existing gabion on north bank 6'W, 3'H, 40' long Protects K-M 30" line (E lines are on high ground to north and South of Las Huertas) Construct large dumped rock GC structure at confluence
10		2 E lines; 12" NGL an 8" product are on high ground South of Arroyo del Orno. Bank is 15-20' high and eroding toward the lines, from Orno flows. Potential exposure from lateral erosion. Armor toe with gabions or rock
11	N 35° 19' 57.4" W 106° 27' 02.9"	2 E lines (12" NGL and 8" product) cross over 30" K-M CO_2 line. E lines are 26" deep Consider GC structure west of (11)
12, 13, 14		K-M 30" CO_2 line crosses las Huertas Arroyo. Depth unknown

15	N 35° 20' 04.3" W 106° 27' 32.9"	Newly installed (Spring 2011) concrete articulated mat over 3 Enkerprise liner. Note: COE required removal of gabion protection on south bank, which is called for in Prudent Line Study. Gabion bank protection should be re-installed
16	N 35° 19' 52.1" W 106° 26' 54.4"	96" CMP on Arroyo del Orno under Cedar Creek Road. Existing gabions protect 2 E liner - 12" NGL and 8" product. Severe erosion. Extend gabions and mat downstream 300 ft from existing, and install grade control at end

Oil Spill Damage in River Tallied

Pipeline Rupture Sullies Waters

BY MATTHEW BROWN
The Associated Press

LAUREL, Mont. — Teams of federal and state workers fanned out Sunday along Montana's famed Yellowstone River to gauge the environmental damage from a ruptured Exxon Mobil pipeline that spewed tens of thousands of gallons of crude oil into the waterway.

The break near Billings, in south-central Montana, fouled the riverbank and forced municipalities and irrigation districts to close intakes.

An Environmental Protection Agency spokeswoman, Sonya Pennock, said an unspecified amount of oil could be seen some 40 miles downriver during a fly-over Sunday, and there were other reports of oil as far as 100 miles away near the town of Hysham.

But an Exxon Mobil Corp. executive said shoreline damage appeared to be limited to the Yellowstone between Laurel and Billings, which includes about 20 miles of river.

Exxon Mobil Pipeline Co. President Gary Pruessing said company observers flying over the river had seen "very little soiling" beyond Billings, and that the oil appeared to be evaporating and dissipating into the river as the flooded Yellowstone carries it downstream.

A representative of the Montana Disaster and Emergency Services Division said the company's claim was reasonable but had not been independently verified.

State officials on Saturday had reported a 25-mile-long slick headed downstream toward the Yellowstone's confluence with the Missouri River, just across the Montana border in North Dakota. An estimated 1,000 barrels, or 42,000 gallons, spilled Saturday before the flow from the damaged pipeline was stopped.

"My guess is that as fast as that water is moving, it's probably dissipating pretty quick," said DES public assistance officer Tim Thennis.

Exxon Mobil also revealed Sunday that the 12-inch pipeline had been temporarily shut down in May because of concerns over the rising waters on the Yellowstone. Pruessing said the company decided to restart the line a day later after examining its safety record and deciding the risk of failure was low.

The company and government officials have speculated that high waters in recent weeks may have scoured the river bottom and exposed the pipeline to debris that could have damaged the pipe. The state has received record rainfall in the last month and also has a huge snowpack in the mountains that is melting, which has resulted in widespread flooding.

"We are very curious about what may have happened at the bottom of the river. We don't have that yet," Pruessing said.

An EPA representative said only a small fraction of the spilled oil is likely to be recovered.

Agency on-scene coordinator Steve Way said fast flows along the flooding river were spreading the oil over a large area, making it harder to capture. But Way said that also could reduce damage to wildlife and cropland along the river.

Crews were putting absorbent material along short stretches of the river in Billings and near Laurel, but there were no attempts at capturing oil farther out in the river. In some areas, oil flowed underneath booms and continued downstream.

Up to 100 emergency response workers from Exxon Mobil and its contractors were due on the scene by late Sunday. Pruessing said they would remain there until the cleanup is complete.

But property owners along the river were growing frustrated with the response, particularly in agricultural areas where crops and pastures for grazing were at risk. The Yellowstone river is also popular among fishermen, though areas further upriver from the spill are more heavily trafficked.

MATTHEW BROWN/THE ASSOCIATED PRESS

Exxon Mobil contractors spread absorbent pads to soak up oil along the banks of the Yellowstone River in Billings, Mont., on Sunday. A company pipeline about 20 miles upriver near Laurel, Mont., ruptured and spilled an estimated 1,000 barrels of crude into the river on Saturday.

ABQ Journal 11/5/2011

Yellowstone Spill To Cost Exxon $135M

■ *Amount more than triple earlier estimates and includes new pipe*

By Matthew Brown
The Associated Press

BILLINGS, Mont. — Exxon Mobil said Friday it expects to incur costs of about $135 million from an oil pipeline break beneath Montana's Yellowstone River that triggered a massive effort to limit damage to the scenic waterway.

The cost figure was released to The Associated Press.

It is more than triple an earlier estimate and includes for the first time the expense of replacing the section of broken pipeline with a new one buried more deeply beneath the river.

The company's 12-inch Silvertip crude oil pipeline broke July 1 during severe flooding.

In the 56 minutes it took Exxon Mobil to seal off the line, an estimated 42,000 gallons of oil leaked into the river near Laurel. That fouled dozens of miles of riverbank, numerous islands and swaths of low-lying cropland with crude.

More than 1,000 workers were involved in the cleanup effort at its peak.

Work to remove the damaged pipeline began Monday and is expected to take several weeks.

An Exxon Mobil spokeswoman declined to offer a detailed breakdown of the company's costs and provided only a broad overview of expenses.

"This estimate includes costs for overall emergency response and cleanup efforts including personnel, equipment, landowner claims and projects associated with the restart of the pipeline such as the horizontal directional drill," company spokeswoman Claire Hassett said.

"Horizontal directional drill" refers to the process the company used to bore a new route for the pipeline dozens of feet beneath the riverbed. That move was mandated by federal pipeline regulators.

The original pipeline was buried only a few feet beneath the riverbed. State and federal officials have speculated that summer flooding scoured the riverbed and left the pipe exposed to damaging debris and the sheer force of the rushing river.

A federal lawsuit against Exxon Mobil is pending from landowners along the river who accuse the company of a "haphazard, sloppy" cleanup.

The lawsuit also claims the company failed to heed warnings from local officials who raised concerns about Silvertip months before the accident. The company denies the claims.

Second Exposed Pipe Ruptures in Flood Zone

By Jack Nicas

A second pipeline ruptured this week on the flooded Missouri River system, a month after federal officials warned operators of the dangers of scouring, or erosion along the beds of flooded rivers.

Enterprise Products Partners LLP said Thursday that scouring fully exposed its pipeline where it broke in the floodplain near Onawa, Iowa. "Over the top and underneath—all of the soil supporting the pipe has been eroded," said Enterprise spokesman Rick Rainey.

The Enterprise pipeline leaked as much as 3,300 barrels of natural-gas liquids after it ruptured early Saturday in a flooded area outside the normal Missouri River channel, Mr. Rainey said.

The greater weight and speed of an overflowing river can shave dozens of feet off its bed by carrying sediment downstream. That can leave pipelines exposed to passing debris and potential rupture. Enterprise said it hasn't determined the exact cause of the break.

Last month, a burst **Exxon Mobil** Corp. pipeline leaked 1,000 barrels of crude into the flooded Yellowstone River in Montana, which feeds the Missouri River. An investigation is continuing, but experts suspect scouring exposed the pipeline that lay five to eight feet beneath the riverbed.

Floodwater scoured more than three feet to reach the Enterprise pipeline, Mr. Rainey said. That erosion shows the danger flooding poses to pipelines not only where they cross rivers, but also beneath floodplains, where pipelines are sometimes buried at shallower depths using a method more susceptible to scouring.

The Enterprise pipeline was drilled about 20 feet beneath the Missouri riverbed in 1998. Less than a mile east, where it broke, the pipeline was installed at least three feet beneath dry land by digging a ditch, laying the pipe and covering it. The Exxon pipeline in Montana was also installed via the ditch method, as were at least 21 of the 41 pipelines that cross the Missouri from Bismarck, N.D., to St. Louis.

Several hours after the Enterprise spill, Magellan Midstream Partners said it suspended one of its two pipelines that cross the Missouri within a mile of the Enterprise line because the company feared scouring in the floodplain.

Near Bismarck in July, state officials found scouring about 30 feet deep in at least eight places in the Missouri. Downstream, at least 23 pipelines lie 20 feet or less below the riverbed.

Federal rules require that pipelines be buried only four feet below the riverbed—a requirement many experts feel is out of date. In an advisory bulletin last month, the U.S. Pipeline and Hazardous Materials Safety Administration, which oversees pipeline safety, urged operators to "determine if flooding has exposed or undermined pipelines as a result of...erosion or scouring," using divers or sonar scans.

Enterprise had scheduled sonar scans for this week, "so it's ironic that it happened right before they were going to take those readings," Mr. Rainey said. Flooding on the Missouri is expected to last into September.

The Environmental Protection Agency said it has found virtually no evidence of the spill—neither dead fish nor any visible sheen in the water. "Whatever amount was released from the pipe either dissipated very quickly in the water or rose to the surface and quickly evaporated," said EPA spokesman Chris Whitley.

—Ben Lefebvre contributed to this article.