Sewer Replacement – Ruidoso Downs to WWTP
Preliminary Engineering Report

December 2009

Prepared for

Village of Ruidoso, New Mexico
313 Cree Meadows Drive
Ruidoso, NM 88345

PREPARED BY

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WCI#: 0820003004

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October 2009

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Village of Ruidoso, New Mexico
313 Cree Meadows Drive
Ruidoso, NM 88345

I, JoAnne Barnett, certify that I am a licensed Professional Engineer (NMPE # 18090), and that this report was prepared by me or under my direction.

JoAnne Barnett, P.E.

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1.0 GENERAL

1.1 Background

In July 2008, Hurricane Dolly made landfall on the southern Gulf Coast of Texas as a Category 2 hurricane with widespread flooding and 100 mile per hour winds. As the storm moved inland into New Mexico it was downgraded to Tropical Storm Dolly. The remnants of the storm caused five days of major flooding of the Rio Ruidoso through Ruidoso, the largest community in the Sacramento Mountains of New Mexico. Refer to Figure 1-1, Location Map. The overflowing river washed out 13 bridges, damaged approximately 250 homes/structures, and damaged the Ruidoso Downs Racetrack. The flood damaged or destroyed sanitary sewers and manholes located along the river in the Upper Canyon area, through the Village, through Ruidoso Downs, and damaged the joint use interceptor pipeline that carries wastewater flows to the Ruidoso Regional Wastewater Treatment Plant (WWTP).

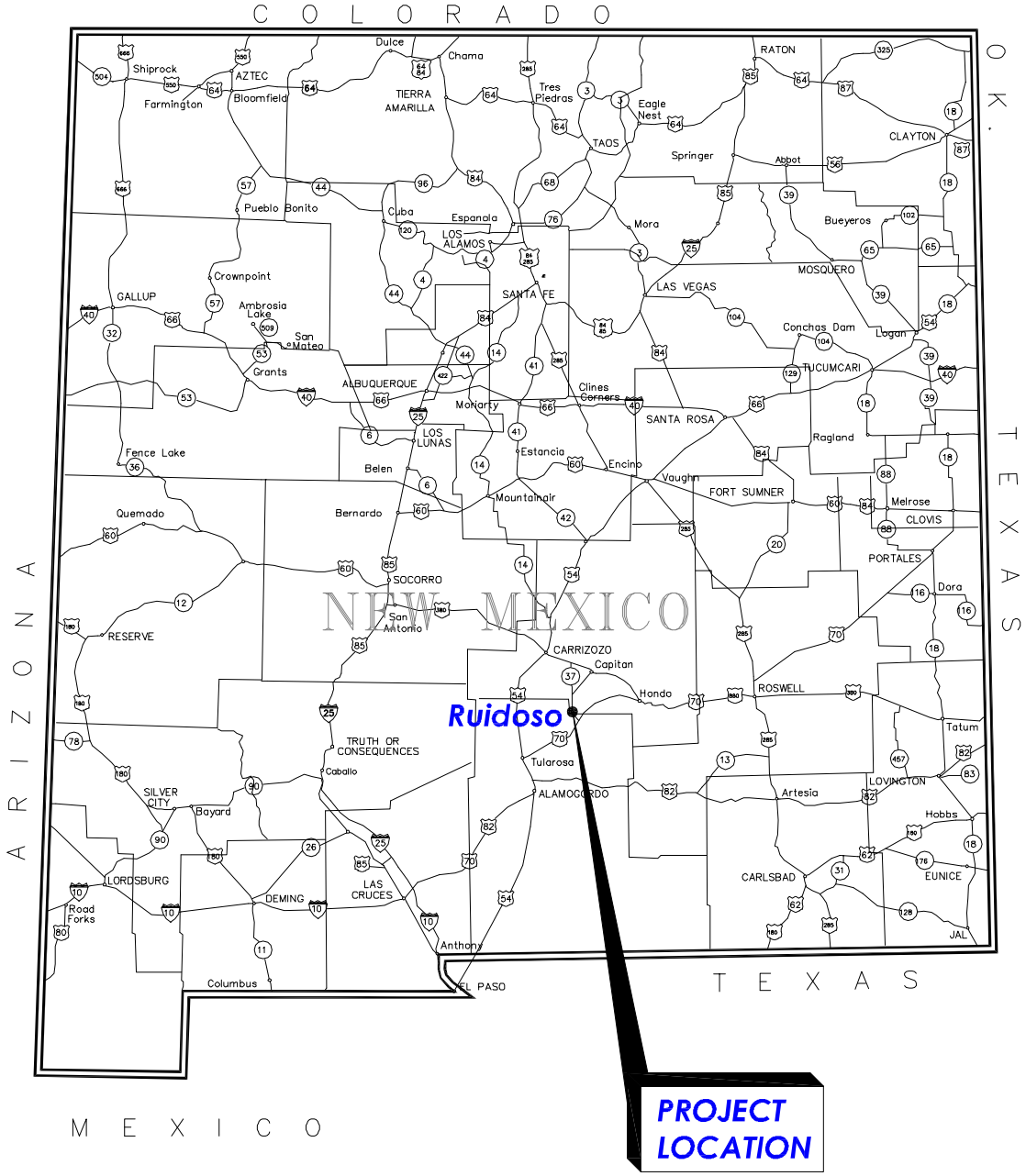
The United States Geological Survey (USGS) Hollywood Station stream recorder located in downtown Ruidoso measured the magnitude of the flood. The flow in the river was recorded to be 1630 cubic feet per second (cfs) at the height of the flood conditions and the gage height read 12.08 feet. This is the second highest amount recorded at this gage station since records have been kept starting in 1954. The USGS Hollywood Station stream recorder is located approximately 500 feet west of the Village of Ruidoso's wastewater flow metering station.

1.2 Project Description

The Sewer Replacement – Ruidoso Downs to WWTP project includes the replacement of, and/or realignment of, the flood destroyed and significantly damaged joint use interceptor pipeline located along the Rio Ruidoso, specifically between the Village of Ruidoso-Ruidoso Downs boundary and downstream to the WWTP. Existing manhole #74, located on the interceptor at the Village-Ruidoso Downs boundary, is the starting point on the west end of the joint use interceptor for this report. Existing manhole #1, located on the east end of the joint use interceptor on the south side of the WWTP is the end point.

1.3 Preliminary Engineering Report

The purpose of the Preliminary Engineering Report is to summarize the impact that the flood had on the existing joint use interceptor pipeline and to recommend mitigation as necessary to restore the pipeline to its pre-disaster condition. Such mitigation will include appropriate engineering codes and standards to establish the pipe's hydraulic capacity and performance. Alternatives considered for the restoration of the pipeline are presented in Section 5.0. Section 7.0, Proposed Project, discusses the project and estimated costs associated with the alternative recommended for implementation.



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Village of Ruidoso, New Mexico
Sewer Replacement-Ruidoso Downs to WWTP

Figure 1-1
Location Map
DATE: May 2009

2.0 PROJECT AREA

The Sewer Replacement - Ruidoso Downs to WWTP project is located along the Rio Ruidoso for a length of approximately five miles, bounded on the west by the Village-Ruidoso Downs boundary at manhole #74, and on the east by manhole #1 located south of the Ruidoso Regional Wastewater Treatment Plant (WWTP). Refer to Figure 2-1 for Project Location Map.

3.0 EXISTING SEWER

3.1 History

The existing interceptor pipeline was constructed in 1980 for joint use by the Village of Ruidoso and Ruidoso Downs to transport wastewater flows to the Regional Wastewater Treatment Plant. The length of the pipeline from the Village-Downs boundary to the treatment plant is approximately five miles. The interceptor follows the river alignment which is the natural low point for the mountainous community. The pipeline crosses the river three times before reaching the treatment plant. Refer to Figure 3-1, and Figure 3-2, for the existing alignment of the joint use interceptor. The pipeline carries flows from the Village of Ruidoso to the WWTP and intercepts flows from the Ruidoso Downs community and the Ruidoso Downs Racetrack facility along the way.

Since the interceptor has been in service, the Village has observed that the pipeline is subject to the seasonal high flows of the river and the region's high precipitation. However, the July 2008 flood event had an increased magnitude of force and intensity that impacted the pipeline's integrity due to the extent and duration of the flood conditions. The Village did not anticipate, and was not prepared for, the greater than 500 year storm and five day flood event that was not within the region's previous recorded history.

3.2 Condition of Existing Interceptor

The interceptor has been in service approximately 30 years and consists of clay pipe ranging in size from 15-inch diameter upstream to 24-inch diameter approaching the treatment plant. The pipeline varies in size and changes slope over its length to maintain velocity. Ductile iron pipe material is typical at original river crossings and in some sections where the pipeline was replaced in the past. The original ductile iron pipe river crossings were encased in concrete. Two of the river crossings today are ductile iron pipe encased in a larger ductile iron pipe. The manholes, which are a critical appurtenance to the pipeline, are typically 4 ft. diameter, precast concrete, and vary in depth.

3.2.1 Pipeline

Immediately following the flood, the Village of Ruidoso hired several contractors on an emergency basis to remedy the flood damaged pipeline. The goal was to repair the

Limits of Project: Village of Ruidoso/Ruidoso Downs Boundary on the West to the WWTP to the East

Ruidoso Regional Wastewater Treatment Plant

Rio Ruidoso

Village of Ruidoso/ Ruidoso Downs Boundary

US HWY 70

Village of Ruidoso, New Mexico
Sewer Replacement-Ruidoso Downs to WWTP

Figure 2-1
Project Location Map
DATE: May 2009

SCALE: 0 2000'

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M:\WWW\08-200-030-04\CADD\EXHIBITS\FIGURES\FIG 2-1.dwg

Joint Use Interceptor Pipeline Legend

- Existing Pipeline Alignment
- Rio Ruidoso
- U.S. Highway 70
- River Crossing

JOINT USE INTERCEPTOR PIPELINE

River Crossing No. 2

River Crossing No. 1

Rio Ruidoso

Village of Ruidoso/ Ruidoso Downs Boundary

Manhole #74 West Boundary Joint Use Interceptor

US HWY 70

Ruidoso Downs Race Track

NO SCALE

Village of Ruidoso, New Mexico
Sewer Replacement-Ruidoso Downs to WWTP

Figure 3-1
Joint Use Interceptor
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Joint Use Interceptor Pipeline Legend

- Existing Pipeline Alignment
- Rio Ruidoso
- U.S. Highway 70
- River Crossing

Ruidoso Regional Wastewater Treatment Plant

River Crossing No. 3

Rio Ruidoso

Manhole #1 East Boundary Joint Use Intereptor

US HWY 70

Rio Ruidoso

River Crossing No. 2

JOINT USE INTERCEPTOR PIPELINE

N

NO SCALE

Village of Ruidoso, New Mexico
Sewer Replacement-Ruidoso Downs to WWTP
Figure 3-2
Joint Use Interceptor
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pipeline to restore a comfort level for the Village during the next rainy season. The contractor repaired a section of exposed and damaged interceptor located near manhole number 29, and repaired the stream bed and bank to provide temporarily cover on that pipeline. Such repairs are temporary and will require mitigation as part of the overall pipeline renewal. Several months after the flood, the Village conducted an emergency closed circuit television (CCTV) inspection of the Upper Canyon collection system and the joint use interceptor pipeline. The inspection did not include the entire length of the interceptor pipeline because flows were too high to camera the line and the pipeline had obstructions and damage from the flood. Infiltration was observed to start approximately one half mile east of the Village/Ruidoso Downs boundary and remained a problem from that point to the WWTP. Normal seasonal high flow causes surcharges in the pipeline which affect the pipe's joints from the inside. Average flows subject the pipe's joints to ground water pressure and infiltration from the outside. The internal hydrostatic pressure put on the pipe and its joints during the five day flood duration had the capacity to permanently blow joints out on the pipeline already taxed by such drastic changes in system pressure. The sections of pipe that were inspected resulted in various findings:

- The interceptor had very high flows in the pipe from the Downs all the way to the treatment plant for several days during the inspection. After several days the flow was at a minimum. This flow volume is evidence of a high amount of infiltration through bad pipe joints and broken pipe.
- The pipeline inside the Downs Racetrack area had signs of a choke in the system from debris and problems in the pipe downstream.
- The pipeline downstream of the Ruidoso Downs metering station choked from hydraulic overload and debris in the pipe. The line backed up into the metering station.
- The river has encroached closer to the pipeline system making it subject to future damage from floods and seasonal high flows.
- An eroded river bank exposed one stretch of 18-inch ductile iron pipe as a result of the river changing course. The pipe appears to have floated during the flood then settled after the flood subsided. The pipe is damaged on the exterior, out of alignment, and subject to failure.

3.2.2 River Crossings

The joint use interceptor pipeline crosses the river three times before it reaches the WWTP. The river crossings consist of an 18-inch diameter pipe crossing, a 21-inch diameter pipe crossing, and a 24-inch diameter pipe crossing. The pipe crossings are encased in concrete or in a larger ductile iron pipe. The crossings were designed originally to be buried 2 ft. minimum below the river bed, measured from the river bed to the top of pipe installation. The river crossings have been compromised as a result of the river's force and intensity scouring the river bed and banks during the flood. A recent land survey conducted by the Village reports the following findings:

- The river crossing at the Downs Racetrack is buried. The pipe crosses the river under the actual track and is connected by two buried manholes. This river crossing will remain unchanged since the pipeline crosses under the river's concrete culvert and has a stable installation.
- The two river crossings located east of the Downs Racetrack have less than 2 ft. of cover and require mitigation to meet the USACE requirement of a minimum 4 ft. bury from river bed to top of pipe installation.

3.2.3 Manholes

Manholes on the interceptor pipeline are typically 4 ft. diameter, precast concrete, and vary in depth. Not all of the manholes on the pipeline were accessed during the emergency CCTV inspection because of very high flows observed in manhole spot checks along the existing alignment. Manholes were reported to have the following problems:

- Several manholes are now located closer to the river, or in the river, because the river meandered closer to the pipeline during the flood.
- Manholes had signs of infiltration through pipe barrel connections
- Manholes had signs of leakage through barrel seals during surcharging in system
- Infiltration was observed through a manhole at interior pipe drop penetration
- Infiltration of flood water through chimney joints and rim and casting installation
- Manholes located west of and within the Ruidoso Downs Racetrack had debris in the inverts and had signs that the manholes were submerged during the flood contaminating the river.

Further field inspection of the manholes is recommended for all manholes on the interceptor pipeline.

3.2.4 Metering Stations

Three metering stations measure the wastewater flows that enter the joint use interceptor. They are as follows:

- Village of Ruidoso Metering Station
- Ruidoso Downs Racetrack Metering Station
- Mescalero Reservation Metering Station

The Village of Ruidoso's metering station is located on the interceptor pipeline west of Village manhole #74 near the west end of the project area. It is located directly on the pipeline. The Village's metering station was not damaged during the flood and is in operating order.

The Downs Racetrack metering station is located outside of and east of the racetrack, adjacent to the interceptor pipeline between Village manhole numbers 54 and 53. It measures wastewater flows from the racetrack facility and discharges into manhole 53. The Downs Racetrack metering station was damaged due to hydraulic overload in the system downstream causing a surcharge through the station's Parshall flume. The station was not in service and had no electrical power as reported in the emergency CCTV inspection, and as observed during our site visit of April 15, 2009. The City of Ruidoso Downs has reported to the Village that the Downs Racetrack staff repaired and cleaned the metering station since that time, and the metering station is now in operating order. Metering the flows identifies diurnal and peak flows from each source and allows for the opportunity to evaluate groundwater infiltration and inflow volumes. The metering devices must be functional for this purpose.

The Mescalero Reservation metering station measures wastewater flows from the reservation but it is not located near the interceptor pipeline. It is located on the south Village boundary with the reservation and was not affected by the flood.

Refer to Figure 3-3, Metering Stations, for the location of the metering stations and the USGS Hollywood stream gage station.

3.3 Suitability for Continued Use

The existing joint use interceptor pipeline is suitable for continued use if the pipeline is mitigated to its pre-disaster condition. The original pipe has adequate hydraulic capacity to transport the community's wastewater flows to the Ruidoso Regional WWTP. The pipe's capacity does not include the excess infiltration and inflow (I/I) flows resulting from proximity to the river or damage to the pipe caused by the flood. Excess I/I displaces the wastewater volume required during normal high flows. Elimination of the I/I will project a more accurate peak flow to the new WWTP expansion presently under construction.

4.0 NEED FOR THE PROJECT

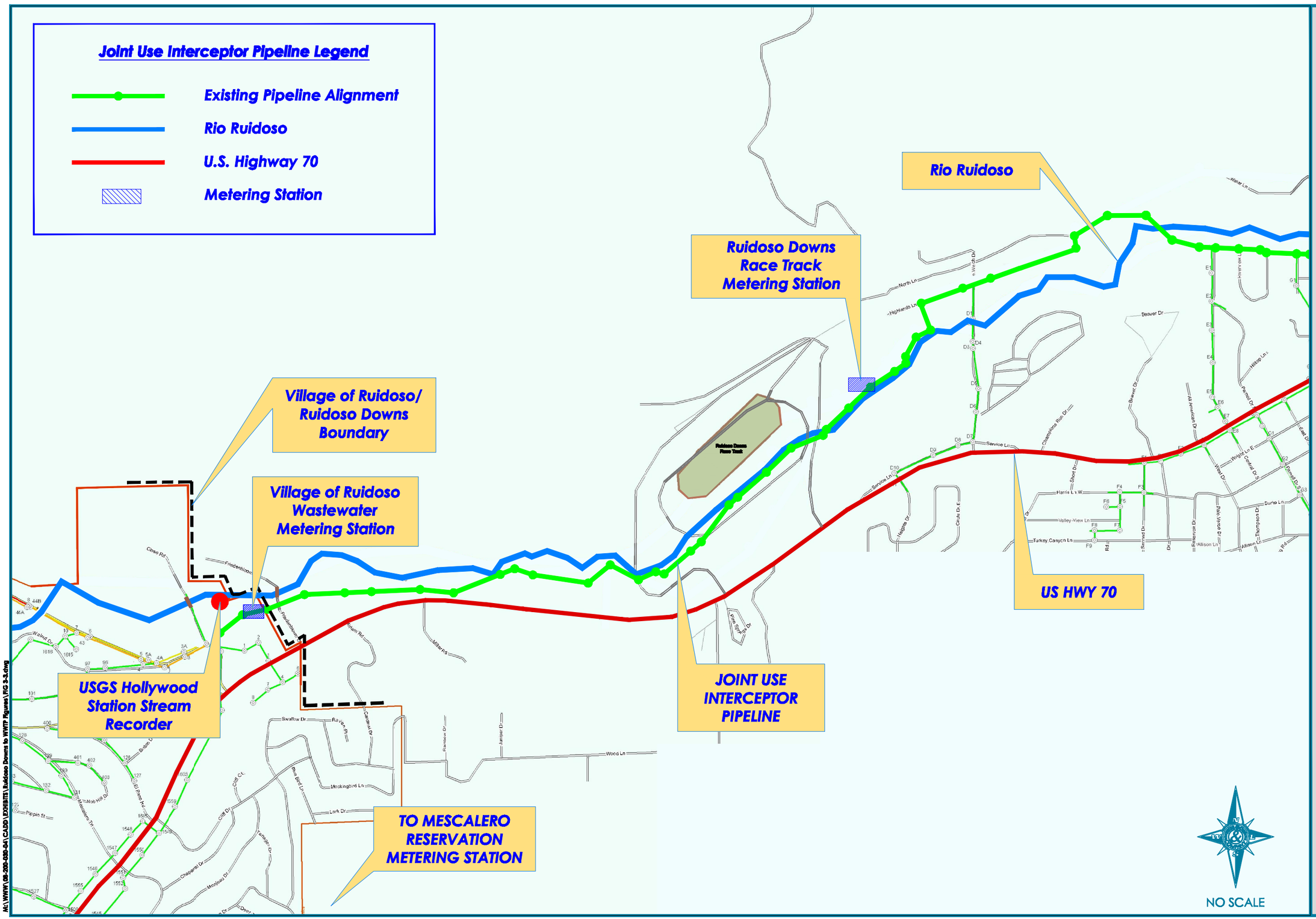
The July 2008 Ruidoso flood damage was isolated along the river in the Upper Canyon and the mid-town area, and along the alignment of the joint use interceptor pipeline. The damage in the Upper Canyon impacted the interceptor pipeline downstream causing flood waters and debris to enter the interceptor through broken pipe and manholes. The need for the project is to assist the Ruidoso community in their recovery from the devastating flood event and to restore the interceptor system to reliably transfer wastewater from the collection system to the Ruidoso WWTP.

4.1 Health and Safety

The joint use interceptor sewer essentially parallels the river between the Village of Ruidoso-Ruidoso Downs boundary and the Ruidoso Regional Wastewater Treatment Plant. The force and intensity of the flood waters changed the river's course exposing the interceptor pipeline,

Joint Use Interceptor Pipeline Legend

- Existing Pipeline Alignment
- Rio Ruidoso
- U.S. Highway 70
- Metering Station



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Village of Ruidoso, New Mexico
Sewer Replacement-Ruidoso Downs to WWTP
Figure 3-3
Metering Stations
DATE: May 2009

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moved the river closer to the pipeline and manholes, and compromised the pipeline's performance due to the hydraulic overload and increased interior hydraulic pressure which impacted the pipe and pipe joints. Failure of the pipeline has caused contamination of the river and/or ground water evidenced by the presence of algae in areas of the river adjacent to the pipeline. Contamination of the environment will jeopardize the health and safety of Ruidoso community.

4.2 Interceptor Capacity

The interceptor was designed to carry wastewater flows from the Ruidoso community's wastewater collection system to the treatment plant. A functional, safe, reliable, and cost effective interceptor pipeline is a critical element of the planned recovery for Ruidoso. The flood impacted the pipeline and manholes with flows that exceeded the pipeline's hydraulic capacity for a period of five days. Hydraulic overload subjected the pipe to an increase in internal hydrostatic pressure for the flood duration causing joint and pipe defects that adversely influence the performance of the sewer under normal operating conditions. The pipeline has an excess amount of infiltration and inflow (I/I) which is currently displacing wastewater capacity. Under normal conditions the pipeline is not subject to hydraulic overload. The performance of the existing pipeline has been compromised and the pipeline's original wastewater flow capacity must be restored to render the pipeline reliable to transport wastewater flows from the Ruidoso community to the WWTP. The Village of Ruidoso, a resort town, sees increased wastewater flows on weekends resulting from an increase in the tourist population. Elimination of excess I/I from the pipeline through system mitigation will restore the pipe's wastewater capacity.

5.0 ALTERNATIVES CONSIDERED

This section presents three (3) alternatives considered as reasonable to provide a solution to restore the damaged joint use interceptor pipeline and manholes to beneficial use.

Alternative 1, No Action, presents the option that the Village of Ruidoso take no action and continue use of the joint use interceptor pipeline in its current condition which includes only the emergency repairs made after the flood.

Alternative 2, the In-River alternative, presents the option to replace/repair the sewer in-place in its current location. It allows the interceptor to follow its original alignment in, or adjacent to, the river.

Alternative 3, the Out-of-River alternative, presents the option to remove the sewer in whole or in part from the river. This alternative is required to be evaluated by the Village at the request of the U.S. Army Corps of Engineers (USACE).

Each alternative may be impacted by the fact that the river was also damaged by the flood and the planned restoration and stabilization of the river by the National Resource and

Conservation Service (NRCS) may affect the existing alignment and/or the recommended realignment of the pipeline.

The evaluation of each alternative includes consideration of the following:

- The village's emergency CCTV inspection conducted after the flood
- Engineering site visit and visual inspection
- Requirements set forth by FEMA and USACE
- Industry standard and accepted engineering/construction practice
- Construction schedule
- Property boundaries
- NRCS river restoration and stabilization

5.1 Alternative 1: No Action

5.1.1 Description

The Village of Ruidoso made emergency repairs to damaged sections of the interceptor pipeline immediately after the flood in the amount of $2,132,000. No additional repairs have been made to the pipeline since that time. Alternative 1, No Action, results in the joint use interceptor pipeline remaining in place, as is, with only the emergency repairs made to the pipeline after the flood. No investments or capital improvements to improve the system's long-term performance will be made. The pipeline requires a cleaning to remove the flood's debris and sediment to reestablish the interceptor's hydraulic capacity. The cleaning should be done immediately.

5.1.2 Map

Figures 5-1, 5-2, and 5-3, show Alternative 1, No Action. Basically, the interceptor alignment is the same as the existing alignment. Figure 5-2 shows the area that received emergency repairs after the flood.

5.1.3 Environmental Impacts

Environmental impacts include continued contamination of ground water and surface water by infiltration and exfiltration through damaged joints. Seasonal rain events or future flood conditions will likely cause more damage requiring emergency replacement of components and/or segments of the joint use interceptor pipeline.

An environmental assessment is currently underway for the sewer replacement needs associated with the joint use interceptor alignment. The report, "*An Environmental Assessment of Sewer Line Improvements in the Village of Ruidoso and Ruidoso Downs, Lincoln County, New Mexico*", by Zia Engineering & Environmental Consultants, LLC, is scheduled for Final/Draft completion in January 2010.

Joint Use Interceptor Pipeline Legend

No Change

Emergency Repair

Limits of Project

Village of Ruidoso/ Ruidoso Downs Boundary

Village of Ruidoso Wastewater Metering Station

USGS Hollywood Station Stream Recorder

Rio Ruidoso

JOINT USE INTERCEPTOR PIPELINE

Ruidoso Downs Race Track Metering Station

River Crossing No. 1

US HWY 70

Ruidoso Downs Race Track

North Ln

Highlands Ln

Service Ln

Heights Dr

Pine Springs Dr

Dipaolo Hill Dr

Close Rd

Friedenbloom Dr

Miller Rd

Swallow Dr

Raven Pl

Cardinal Dr

Juniper Dr

NO SCALE

Village of Ruidoso, New Mexico
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Figure 5-1
Alternative 1: No Action
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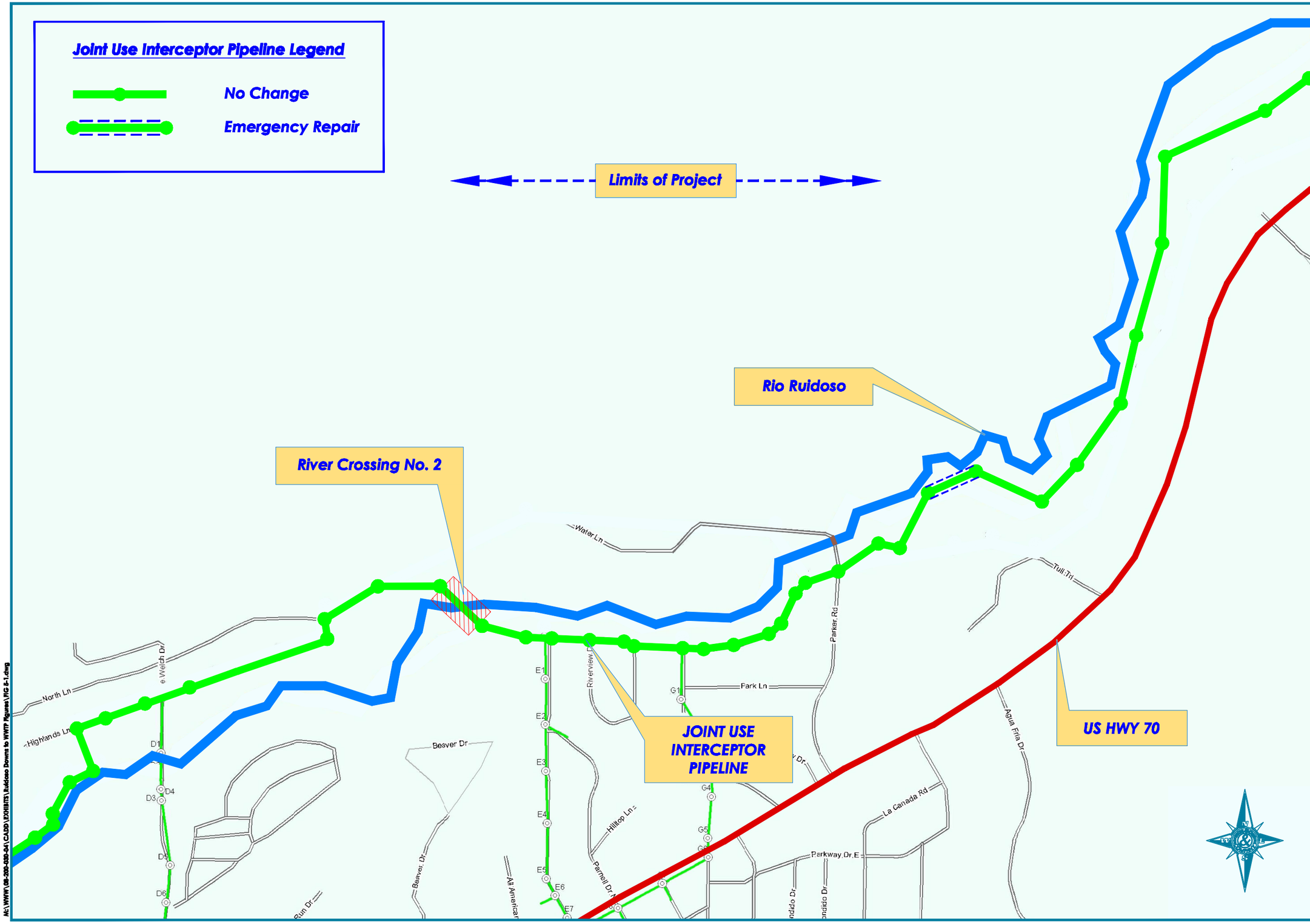

Village of Ruidoso, New Mexico
Sewer Replacement-Ruidoso Downs to WWTP
Figure 5-2
Alternative 1: No Action
DATE: May 2009

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M:\WWW\08-200-030-04\CADD\EXHIBITS\Ruidoso Downs to WWTP Figures\FIG 5-1.dwg

Joint Use Interceptor Pipeline Legend

- No Change
- Emergency Repair

Limits of Project

Ruidoso Regional Wastewater Treatment Plant

Wastewater Treatment Plant

River Crossing No. 3

Rio Ruidoso

JOINT USE INTERCEPTOR PIPELINE

US HWY 70

Apple Blossom Dr

Biscuit Hill Rd

White Angle Ln

Hale Lake Rd - E001

Wrangler Rd

Tree Rv Park Ln

N

NO SCALE

Village of Ruidoso, New Mexico
Sewer Replacement-Ruidoso Downs to WWTP
Figure 5-3
Alternative 1: No Action
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5.1.4 Land Requirements

There is no land requirement associated with the No Action Alternative.

5.1.5 Construction Problems

There are no construction problems associated with the No Action Alternative.

5.1.6 Cost Estimate

The costs incurred by the Village of Ruidoso for the Alternative 1, No Action approach, is **$2,298,563** including NMGRT based on emergency repairs. A breakdown of the cost is presented in Table 5-1.

5.1.7 Advantages / Disadvantages

Advantages:

- FEMA would not incur funding costs associated with pipeline mitigation.
- Village action includes cleaning the pipeline to restore hydraulic capacity.

Disadvantages:

- The Village would continue to use the damaged joint use interceptor pipeline in its current condition.
- Increased maintenance of the pipeline and unpredictable emergency repairs with associated high costs on a yearly basis.
- Continued use of the damaged infrastructure will allow continued infiltration, exfiltration, and subsequent environmental and health problems.
- Continued system and/or wet weather discharges due to no action by the Village to improve the system may result in an Administrative Order from the United States Environmental Protection Agency (USEPA) resulting in fines for both criminal and civil violations.

5.2 Alternative 2: In-River

5.2.1 Description

This alternative repairs and/or replaces the existing pipeline in-place where it had been damaged, destroyed, or exposed by the flood. The Village replaced pipe lengths destroyed by the flood on an emergency basis immediately following the flood event. Trenchless pipe renewal methods will be used in place of traditional open cut conventional construction for replacement of pipe that is buried. Manholes will be rehabilitated to eliminate infiltration. Manholes that are structurally damaged will be replaced. The In-River Alternative will require pre-construction CCTV inspection and cleaning, and post construction CCTV inspection. In cases where the pipe's current location is not conducive to trenchless technology, the pipe will be replaced or realigned by conventional construction methods to protect the river. The In-River

Village of Ruidoso, New Mexico
Sewer Replacement - Village / Downs Boundary to WWTP

Table 5-1: Opinion of Alternative 1 - No Action Project Cost

Item		Cost
Alternative 1 - No Action		
Sub-total Construction Cost	$	2,132,000.00
NMGRT @ 7.8125% for Construction	$	166,562.50
Total Construction Cost:	**$**	**2,298,562.50**
Engineering Services: (None; emergency basis)		n/a
Total Alternative 1 - Project Cost:	**$**	**2,298,562.50**

NOTE:

1. A breakdown of the Alternative 1 estimated construction cost is included in Appendix A to this report.

Alternative will have a large high cost associated with by-pass pumping for trenchless technology methods and a similar high cost for dewatering associated with conventional construction methods. A new CCTV of the interceptor pipeline and manholes will determine what method will be used, and where, to mitigate the interceptor pipeline. The interceptor river crossings will be mitigated to provide the required US Army Corps of Engineers (USACE) 4 ft. of cover, minimum, from river bed to top of pipe.

5.2.2 Map

Figures 5-4, 5-5, and 5-6, show the Alternative 2, In-River alignment. The existing interceptor pipeline and manholes, in general, will be renewed using trenchless technology methods. Sections of pipeline and manholes that cannot be renewed will be realigned away from the river and the existing pipe and manholes abandoned in place.

5.2.3 Environmental Impacts

Construction activities associated with repairs and replacement of the joint use interceptor in-river, in-place, where it had been damaged, destroyed, or exposed by the flood will require clearance and/or a permit from the NM Fish and Game Department and the USACE relative to proximity of construction activity to the river. Both conventional construction and trenchless technology will have environmental impacts. Clearance from the State Historic Preservation Office (SHPO) may also be required, however the project site follows the original pipeline alignment rendering the project area cleared of cultural sites. Design and construction permitting requirements for the interceptor/river interaction and adjacent temporary construction easement needs will affect costs of the project and as well as construction scheduling.

An environmental assessment is currently underway for the sewer replacement needs associated with the joint use interceptor alignment. The report, "*An Environmental Assessment of Sewer Line Improvements in the Village of Ruidoso and Ruidoso Downs, Lincoln County, New Mexico*", by Zia Engineering & Environmental Consultants, LLC, is scheduled for Final/Draft completion in January 2010.

5.2.4 Land Requirements

Several locations along the pipeline will require realignment of the pipe away from the river. Land requirements for realignment in these locations is minimal and may result in an access/utility easement. No land acquisition is required for lengths of pipeline that will be rehabilitated in place. Temporary construction easements will be required from adjacent land owners for contractor staging areas during construction. Such easements will be restored to their original condition when construction is completed.

Joint Use Interceptor Pipeline Legend

- No Change
- Pipe Rehab
- Abandon in Place
- Realignment

Limits of Project

Village of Ruidoso/ Ruidoso Downs Boundary

Village of Ruidoso Wastewater Metering Station

USGS Hollywood Station Stream Recorder

Rio Ruidoso

JOINT USE INTERCEPTOR PIPELINE

Ruidoso Downs Race Track Metering Station

River Crossing No. 1

US HWY 70

NO SCALE

Village of Ruidoso, New Mexico
Sewer Replacement-Ruidoso Downs to WWTP
Figure 5-4
Alternative 2: In-River Pipeline Renewal
DATE: May 2009

WILSON & COMPANY
2600 The American Rd. SE Ste. 100
Rio Rancho, New Mexico 87124
505-896-9021

M:\WWW\09-200-030-04\CADD\EXHIBITS\Ruidoso Downs to WWTP Figures\FIG 5-4.dwg

Joint Use Interceptor Pipeline Legend

- No Change
- Pipe Rehab
- Abandon in Place
- Realignment

Limits of Project

Rio Ruidoso

River Crossing No. 2

JOINT USE INTERCEPTOR PIPELINE

US HWY 70

Water Ln
Tull Trl
Parker Rd
Park Ln
Riverview Dr
Aguila Fria Dr
La Canada Rd
Parkway Dr E
Hilltop Ln
Parnell Dr
Beaver Dr
All American
Run Dr
North Ln
Highlands Ln
e Welch Dr
D1
D3
D4
D5
D6
E1
E2
E3
E4
E5
E6
E7
G1
G4
G5
G6

Village of Ruidoso, New Mexico
Sewer Replacement-Ruidoso Downs to WWTP

Figure 5-5
Alternative 2: In-River Pipeline Renewal
DATE: May 2009

WILSON & COMPANY
2600 The American Rd. SE, Ste. 100
Rio Rancho, New Mexico 87124
505-998-6021

M:\WWW\08-500-026-04\CAD\EXHIBITS\Alternative Downs to WWTP Figures\VIG 5-4.dwg

Joint Use Interceptor Pipeline Legend

- No Change
- Pipe Rehab
- Abandon in Place
- Realignment

Limits of Project

Ruidoso Regional Wastewater Treatment Plant

Wastewater Treatment Plant

River Crossing No. 3

Rio Ruidoso

JOINT USE INTERCEPTOR PIPELINE

US HWY 70

N

Apple Blossom Dr

Biscuit Hill Rd

White Angle Ln

Hale Lake Rd - E001

Fs443

Wrangler Rd

Tree Rv Park Ln

NO SCALE

Village of Ruidoso, New Mexico
Sewer Replacement-Ruidoso Downs to WWTP

Figure 5-6

Alternative 2: In-River Pipeline Renewal

DATE: May 2009

WILSON & COMPANY
2600 The American Rd. SE, Ste. 100
Rio Rancho, New Mexico 87124
505-998-8021

M:\ WWW\ (08-200-080-04\ CADD\ EXHIBITS\ Ruidoso Downs to WWTP Figures\ FIG 5-4.dwg

5.2.5 Construction Problems

Renewal of the existing interceptor pipeline in-river, in its original location, may require special equipment due to the proximity of the pipeline to the river. Heavy construction equipment may require stabilized soil. Pipeline rehabilitation equipment requires relatively large staging areas. The required staging areas and access to them will require special temporary construction and access easements. Establish communications with project/community neighbors to keep them informed before and during construction.

5.2.6 Cost Estimate

The opinion of project cost for the Alternative 2, In-River alignment is **$4,415,425** including NMGRT. A breakdown of the opinion of project cost is presented in Table 5-2.

5.2.7 Advantages / Disadvantages

Advantages:

- Trenchless technology using limited construction equipment
- Interceptor pipeline remains in current location
- Conventional construction methods used only for realignment of pipe.

Disadvantages:

- Recurrence of flood event in the future may jeopardize the safety of the interceptor pipeline, manholes, the river, and ground water.
- Realignment requires heavy construction equipment near the river
- By-pass pumping and extensive dewatering
- Pre and post construction CCTV inspection and cleaning
- Emergency unscheduled repairs may be required on the existing pipeline during construction due to the pipe's condition.
- This in-river approach will require complicated and time consuming efforts during construction including environmental documentation, permitting, and rigid monitoring of construction activities.

5.3 Alternative 3: Out-Of-River

5.3.1 Description

Alternative 3 is considered to be a principal option based on the request by the USACE to consider removal of the pipeline in whole or in part from its in-river alignment. The intent of this alternative is to realign sections of the pipeline away from the river to prevent a recurrence of damage experienced in the flood and to prevent future contamination of the river. It does not include realignment of the entire pipeline.

Village of Ruidoso, New Mexico
Sewer Replacement - Village / Downs Boundary to WWTP

Table 5-2: Opinion of Alternative 2 - In-River Alignment Project Cost

Item		Cost
Alternative 2 - In-River Alignment		
Sub-total Construction Cost	$	3,578,955.00
NMGRT @ 7.8125% for Construction	$	279,606.00
Total Construction Cost:	$	**3,858,561.00**
Engineering Services		
Basic Engineering Services @ 9.7%	$	347,158.64
Additional Engineering Services		
Serveying	$	44,735.00
Geotechnical	$	21,475.00
Permits	$	-
Construction Observation @ 3% of Construction Cost	$	107,368.65
Sub-total Engineering Services:	$	**520,737.29**
NMGRT @ 6.9375%	$	36,126.15
Total Engineernig Services:	$	**556,863.43**
Total Alternative 2 - Project Cost:	$	**4,415,424.43**

NOTE:

1. A breakdown of the Alternative 2 estimated construction cost is included in Appendix A to this report.

Sections of pipeline that are closer to the river because of the flood will be realigned away from the river with special attention paid to that alignment remaining in the existing easement and not on private land. The interceptor river crossings will be mitigated to provide the required US Army Corps of Engineers (USACE) 4 ft. of cover, minimum, from river bed to top of pipe. Pipe that is located away from the river but is damaged will be renewed in its current location using a trenchless technology such as cured-in-place pipe (CIPP) liner or pipe bursting. In cases where the pipe's current location is not conducive to trenchless technology, the pipe may be replaced with a new alignment installed by conventional construction.

5.3.2 Map

Figures 5-7, 5-8, and 5-9, show the Alternative 3, Out-of-River alignment. The pipeline will be realigned away from the river as shown and existing pipe will be abandoned in place. Sections of pipe that are not realigned will be renewed using a trenchless technology.

5.3.3 Environmental Impacts

Construction activities associated with realigning sections of the pipeline away from the river to get the pipeline out of the river, will require clearance and/or a permit from the NM Fish and Game Department and the USACE for construction activities relative to proximity to the river. The new pipeline alignment will require clearance from the State Historic Preservation Office (SHPO) for cultural sites on land along the new alignment where construction occurs outside the river boundary. The realigned pipeline will require new utility easements and temporary construction easements from private land owners which may require cultural surveys. Design and construction permitting for this alternative will affect costs of the project and construction scheduling.

An environmental assessment is currently underway for the sewer replacement needs associated with the joint use interceptor alignment. The report, "*An Environmental Assessment of Sewer Line Improvements in the Village of Ruidoso and Ruidoso Downs, Lincoln County, New Mexico*", by Zia Engineering & Environmental Consultants, LLC, is scheduled for Final/Draft completion in January 2010.

5.3.4 Land Requirements

Several locations along the pipeline require realignment of the pipe away from the river. Some of the planned realignment may encroach on private land. Where land requirements are minimal for realignment a utility/access easement may be considered. No new land is required for lengths of pipeline that will be rehabilitated in place. Temporary construction easements will be required from adjacent land owners for contractor staging areas during construction. Such easements will be restored to their original condition when construction is completed. Access to the river for construction of the pipeline will require special access easements.

Village of Ruidoso, New Mexico
Sewer Replacement-Ruidoso Downs to WWTP

Figure 5-7

Alternative 3: Out-of-River Pipeline Renewal

DATE: May 2009

Joint Use Interceptor Pipeline Legend

- No Change
- Pipe Rehab
- Abandon in Place
- Realignment

Limits of Project

Village of Ruidoso/ Ruidoso Downs Boundary

Village of Ruidoso Wastewater Metering Station

USGS Hollywood Station Stream Recorder

Rio Ruidoso

Ruidoso Downs Race Track Metering Station

River Crossing No. 1

JOINT USE INTERCEPTOR PIPELINE

US HWY 70

NO SCALE

WILSON & COMPANY
2600 The American Rd. SE Ste. 100
Rio Rancho, New Mexico 87124
505-896-9021

M:\WWW\08-200-030-04\CADD\EXHIBITS\Ruidoso Downs to WWTP Figures\FIG 5-7.dwg

Joint Use Interceptor Pipeline Legend

- No Change
- Pipe Rehab
- Abandon in Place
- Realignment

Limits of Project

Rio Ruidoso

River Crossing No. 2

JOINT USE INTERCEPTOR PIPELINE

US HWY 70

Water Ln
Tull Trl
Parker Rd
Park Ln
Riverview Dr
Aguila Fria Dr
La Canada Rd
Parkway Dr E
Hilltop Ln
Parnell Dr
Beaver Dr
All American
Sun Dr
North Ln
Highlands Ln
e Welch Dr
D1
D3
D4
D5
D6
E1
E2
E3
E4
E5
E6
E7
G1
G4
G5
G6

Village of Ruidoso, New Mexico
Sewer Replacement-Ruidoso Downs to WWTP

Figure 5-8

Alternative 3: Out-of-River Pipeline Renewal

DATE: May 2009

WILSON & COMPANY
2600 The American Rd. SE, Ste. 100
Rio Rancho, New Mexico 87124
505-999-6021

N
W
E
S

M:\WWW\08-505-026-04\CAD\EXHIBITS\Ruidoso Downs to WWTP Figures\FIG 5-7.dwg

Joint Use Interceptor Pipeline Legend

- No Change
- Pipe Rehab
- Abandon in Place
- Realignment

Limits of Project

Ruidoso Regional Wastewater Treatment Plant

Wastewater Treatment Plant

River Crossing No. 3

Rio Ruidoso

JOINT USE INTERCEPTOR PIPELINE

US HWY 70

N

Apple Blossom Dr

Biscuit Hill Rd

White Angle Ln

Hale Lake Rd - E001

Fs443

Wrangler Rd

Tree Rv Park Ln

31

70

Village of Ruidoso, New Mexico
Sewer Replacement-Ruidoso Downs to WWTP
Figure 5-9
Alternative 3: Out-of-River Pipeline Renewal
DATE: May 2009

WILSON & COMPANY
2600 The American Rd. SE, Ste. 100
Rio Rancho, New Mexico 87124
505-998-8021

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5.3.5 Construction Problems

Realignment of the pipeline away from the river will require conventional construction methods including excavation, backfill, possible dewatering, and abandoning the existing sewer and manholes in place. Rehabilitation of the pipeline using trenchless technology eliminates the need for heavy construction methods but may require a large staging area. It minimizes the disturbance to the surrounding area. Space availability for equipment for both construction methods will be required. Establish communications with project/community neighbors to keep them informed before and during construction.

5.3.6 Cost Estimate

The opinion of project cost for the Alternative 3, Out-of-River alignment is **$4,354,871** including NMGRT. A breakdown of the opinion of project cost is presented in Table 5-3.

5.3.7 Advantages/Disadvantages

Advantages:

- Realignment prevents recurrence of pipeline damage during future flood event
- Realignment eliminates future contamination of the river
- Renewal of the pipe with a trenchless technology eliminates the need for open trench construction

Disadvantages:

- Realignment requires heavy construction equipment near the river
- Trenchless technology requires sufficient space for process equipment and pre and post construction CCTV inspection.
- Possible dewatering for conventional construction activities
- Temporary construction easements are required for contractor's work and staging areas

6.0 SELECTION OF ALTERNATIVE

The three (3) alternatives presented in Section 5 of this report are evaluated in this section by a present worth cost analysis and a comparison of associated non-cost factors.

6.1 Present Worth of Alternatives

The present worth (PW) of the costs associated with the No Action, In-River, and Out-of-River Alternatives is based on the investment required now, at 3 percent, over a twenty year period, to cover the capital costs plus the annual operation and maintenance costs of the interceptor.

Village of Ruidoso, New Mexico
Sewer Replacement - Village / Downs Boundary to WWTP

Table 5-3: Opinion of Alternative 3 - Out-of River Alignment Project Cost

Item		Cost
Alternative 3 - Out-of-River Alignment		
Sub-total Construction Cost	$	3,529,875.00
NMGRT @ 7.8125% for Construction	$	275,771.48
Total Construction Cost:	**$**	**3,805,646.48**
Engineering Services		
Basic Engineering Services @ 9.7%	$	342,397.88
Additional Engineering Services		
Serveying	$	44,125.00
Geotechnical	$	21,175.00
Permits	$	-
Construction Observation @ 3% of Construction Cost	$	105,896.25
Sub-total Engineering Services:	**$**	**513,594.13**
NMGRT @ 6.9375%	$	35,630.59
Total Engineernig Services:	**$**	**549,224.72**
Total Alternative 3 - Project Cost:	**$**	**4,354,871.20**

NOTE:

1. A breakdown of the Alternative 3 estimated construction cost is included in Appendix A to this report.

The estimated annual operations and maintenance (O&M) associated with Alternative 1, No Action, is anticipated to be higher than for Alternatives 2 and 3 since the damaged pipeline will not be renewed. The interceptor pipeline requires an immediate cleaning to remove debris and sediment from the flood to maximize the hydraulic capacity of the interceptor.

The No Action alternative will require that the Village staff spend more hours each week maintaining the pipeline.

Annual manpower, 6 hrs/wk:	312.0 hours @ $30/hr.	$9,360
CCTV inspection & cleaning yearly:	5.0 miles @ $5.00/LF	$132,000
Alternative 1 Estimated total O&M cost per year:		$141,360

The estimated annual operations and maintenance (O&M) for the pipeline is the same for Alternatives 2 and 3. The annual O&M includes checking the pipeline and appurtenances 2.0 hours per week, on average, by a member of the public works staff, and an annual CCTV inspection with cleaning over full length of pipeline.

Annual manpower:	104.0 hours @ $30/hr.	$3,120
Annual CCTV inspection & cleaning:	5.0 miles @ $5.00/LF	$132,000
Estimated total O&M cost per year:		$135,120

There is no annual power cost associated with the interceptor pipeline.

6.1.1 No Action Alternative Present Worth

PW	=	Capital Cost*	+ Annual O&M	* Refer to Table 5-1.
	=	$0.00	+ $141,360 (14.877)	
PW	=	$2,103,013		

6.1.2 In-River Alternative Present Worth

PW	=	Capital Cost*	+ Annual O&M	* Refer to Table 5-2.
	=	$3,578,955	+ $135,120 (14.877)	
PW	=	$5,589,135		

6.1.3 Out-of-River Alternative Present Worth

PW	=	Capital Cost*	+ Annual O&M	* Refer to Table 5-3.
	=	$3,529,875	+ $134,120 (14.877)	
PW	=	$5,525,778		

6.2 Debt Repayment

The Federal Emergency Management Agency (FEMA) Public Assistance (PA) Program is providing Federal grant funding for hazard mitigation of the joint use interceptor pipeline. The FEMA PA program requires that the applicant is responsible for approximately 7 percent

of the project cost. For the interceptor pipeline project, such costs will be shared by the Regional Wastewater Treatment Plant Joint Use Board and is broken down to the following percentages based on historic wastewater contributions to the WWTP:

Village of Ruidoso:	87 percent
City of Ruidoso Downs:	15 percent

6.2.1 Alternative 1: No Action

There is no debt repayment for the No Action alternative. The present worth is based on annual O&M costs.

6.2.2 Alternative 2: In-River Alignment:

Project Cost	x	7%	=	Village Cost
$4,415,425	x	0.07	=	$309,080

Total cost to the Village:	$309,080
Net funding needed from NMFA:	$309,080
Annual debt payment for loan: (3%, 20 years)	$ 20,770

6.2.3 Alternative 3: Out-of-River Alignment:

Project Cost	x	7%	=	Village Cost
$4,354,871	x	0.07	=	$304,841

Total cost to the Village:	$304,841
Net funding needed from NMFA:	$304,841
Annual debt payment for loan: (3%, 20 years)	$ 20,486

6.3 Non-Cost Comparison

The non-cost comparison takes into account factors that can not be assigned monetary value but that may have a significant bearing on the selection of an alternative. In general, non-cost factors are very project specific and for this project are ranked from most important to least important, with number 1 being most important. The non-cost factors are then weighted based on their overall importance to the project. The top third are weighted with a number 3, the middle third are weighted with number 2, and the bottom third are weighted with a number 1. The non-cost factors considered for this project and the weight they carry are:

Non-Cost Factors	Rank	Weight
FEMA Compliance & Reliability	1	3
USACE Compliance	2	2
Construction Schedule	3	1

- FEMA Compliance and Reliability is ranked first as the highest ranking since FEMA requires that the pipeline be renewed to its pre-hazard condition. The hazard mitigation shall be in accordance with requirements under Section 406 of the Stafford Act. The important first rank has a weight of 3.
- USACE Compliance factor is ranked second to include the Corps requirement for consideration of realignment of the pipeline out of the river and direction to have 4 ft. of cover from river bed to the top of pipe installation at the river crossings. This factor carries a weight of 2.
- Construction Schedule is ranked third since the urgency to expedite mitigation of the pipeline includes construction duration. Construction duration carries a weight of 1.

The non-cost factors are then scored on a scale of 1 to 5 for each alternative, with 5 being the best and 1 being the worst. The weighted scores are then summed up into a total score for each Alternative as shown in Table 6-1. The total scores are compared to determine the most suitable alternative in terms of non-cost factors.

Table 6-1 presents the non-cost factor weighted scores for the two pipeline mitigation alternatives:

Table 6-1: Alternative Non-Cost Factors Scoring

Non-Cost Factors	Rank	Weight	Alternative 1 No Action		Alternative 2 In-River		Alternative 3 Out-of-River	
			Score	Weighted Score	Score	Weighted Score	Score	Weighted Score
FEMA Compliance and Reliability	1	3	0	0	3	9	5	15
USACE Compliance	2	2	0	0	3	6	5	10
Construction Schedule	3	1	0	0	3	3	4	4
Total Score:				**0**		**18**		**29**

Notes:
1. FEMA: Federal Emergency Management Agency
2. USACE: US Army Corps of Engineers

6.4 Comparison of Alternatives

The present worth costs of Alternatives 2 and 3 show that the cost of both alternatives is very close. Alternative 3, the out-of-river sewer replacement alternative is the least costly option. The non-cost factor analysis shows that Alternative 3 has a higher score than Alternatives 1 and 2. The three alternatives are ranked as follows:

Alternative	Description	Present Worth	Non-Cost Factor Score
3	Out-of-River	$5,525,778	29
2	In-River	$5,589,135	18
1	No Action	$2,103,013	0

Alternative 3 has the most desirable cost and has the highest non-cost factor score. Alternative 2 has a higher construction cost due to the longer length of trenchless technology application to renew the pipeline. The risk associated with choosing Alternative 2, In-River Pipeline Renewal is high. Alternative 1, No Action, presents the greatest risk of all the alternatives since the interceptor pipeline will remain as is with no capital improvements.

6.5 Alternative Selection

Alternative 3, the Out-of-River pipeline renewal, is selected as the alternative to replace the sewer between the Village-Downs boundary and the Ruidoso Regional WWTP. Although the Alternatives 2 and 3 were close in terms of project cost, the non-cost factor scores separated the alternatives relative to compliance and reliability. As such, Alternative 2 is not considered for implementation.

Considering the present worth value and the non-cost factor scores for the alternatives, the least desirable alternative is Alternative 1, No Action. The high cost to mitigate the pipeline in the same location in Alternative 2 comes with no guaranty of protection of the pipeline against future flood conditions. The Alternative 2 low non-cost factor of 18 makes it undesirable. Alternative 3, Out-of-River Alignment, is the best approach to protect the river, ground water, and the public.

7.0 PROPOSED PROJECT

Specifically, the pipeline will be renewed as presented in Alternative 3, the Out-of-River Alignment to restore the pipe and manholes damaged by the flood. The proposed project consists of renewal and realignment of the joint use interceptor pipeline from the Village-Ruidoso Downs boundary to the WWTP.

7.1 Project Design

The various aspects of the project design are discussed in detail in this section.

7.1.1 Pipeline Renewal

The pipeline is proposed to be renewed to restore the interceptor pipe to its condition and hydraulic capacity prior to flood damage. Renewal of the pipeline consists of the following:

- Realignment: Sections of the pipeline will be realigned by conventional construction methods to realign the pipeline away from the river in areas where

the river has changed its course and exposed the pipeline. Pipeline and manholes immediately adjacent to the river are subject to damage with the recurrence of a flood event. The pipeline alignment at the two river crossings located east of the Ruidoso Downs Racetrack will be realigned to lower the pipe a minimum of 4 feet under the river. The realigned river crossings will be implemented by conventional construction methods requiring river flow bypass during construction.

- Rehabilitation: Sections of the pipeline will be rehabilitated in their current alignment with a pipe lining system to restore the pipe and pipe joints to eliminate infiltration and discharge. One section of pipe located east of the Ruidoso Downs Racetrack on the north side of the river will be rehabilitated using pipe bursting to increase the pipe diameter to 24-inches from 18-inches.

  A cured-in-place pipe (CIPP) lining system is one of the most widely used methods of trenchless pipeline renewal for both structural and non-structural purposes. The CIPP process involves a liquid thermoset resin-saturated material that is inserted into the cleaned existing pipeline by hydrostatic, air inversion, or mechanically pulling it with a winch and a cable, and then inflating. The resin has a distinct chemical resistance to domestic sewage.

Approximately 1.23 miles of pipe will be realigned and 4.13 miles of pipe will be rehabilitated. Figures 5-7, 5-8, and 5-9, show the proposed alignment of the renewed pipeline for the Alternative 3, Out-of-River alignment. The interceptor's alignment may be altered to some extent during design and/or as a result of restoration and stabilization of the river by the NCRS.

7.1.2 Manhole Renewal

Mitigation of the joint-use interceptor pipeline includes mitigation of system manholes that were damaged by the flood. The full extent of the damage to the manholes as a result of the flood is not known. Based on the preliminary findings reported in the emergency pipeline inspection, manholes will be rehabilitated as follows:

- **Rehabilitation mortar** to build up structurally corroded manhole surfaces prior to other treatment.
  - Manholes with turbulent flow and interior drops are suspect to this condition

- **Chemical grouting** to mitigate leakage and infiltration.
  - Manholes had signs of infiltration through poor pipe joints at the barrel connection and barrel joint seals
  - Infiltration was observed in a manhole around an interior pipe drop that should be converted to exterior drop

- Infiltration of flood water through chimney joints and rim and casting installation
- Manholes had signs surcharging causing discharge through poor barrel and pipe joints

- **High build epoxy coating system** to mitigate the structural integrity of manholes.
  - Proposed for manholes with extensive corrosion structural damage

Sections of pipe that will be realigned away from the river will receive new manhole installations.

- Realigned pipe will receive new 4 ft. diameter precast concrete manholes

- Existing MH-50 and MH-50A will be replaced with new 6 ft. diameter manholes for the 90 degree transition in the 24-inch diameter pipe in each manhole.

A detailed manhole investigation is recommended for the project design. Similar to the pipeline, the manholes have been in service for almost 30 years and may have hidden problems that will surface upon further inspection. Some manholes may be in good condition. Rehabilitation measures will include renewal of deficiencies that will inherently cause problems in the near future. It is anticipated that multiple renewal components will be required to renovate the manhole structures to make them sound against future flood conditions. There are approximately 80 manholes located on the interceptor pipeline. Approximately 20 manholes will be abandoned in place and replaced with new manhole installations. The remaining manholes will require moderate to complete rehabilitation to restore the integrity of the manholes.

7.1.3 Metering Stations

Only the metering station serving the Ruidoso Downs Racetrack was affected by the flood. As discussed in section 3 of this report, the Downs Racetrack staff repaired and cleaned the metering station and restored it to operating order. No action is therefore required at the metering station. The emergency CCTV inspection reported that the Downs collection system is in need of cleaning. During the site visit in April 2009, the interceptor manhole that receives wastewater flows from the Downs Racetrack collection system was observed to have solids/trash deposited on the bench under the pipe entering the manhole. The racetrack is a private facility, however, as part of the mitigation efforts for the joint use interceptor pipeline, it is recommended in this report that the Village of Ruidoso request that the Ruidoso Downs Racetrack clean and maintain the facility's collection system.

7.2 Construction Cost Estimate

The opinion of estimated construction cost for the joint use interceptor sewer Out-of-River replacement is $3,805,647, including NMGRT. A breakdown of the estimated construction

cost for the selected alternative, Alternative 3, is included in Appendix A to this report. The opinion of total project cost for the Out-of-River alignment is $4,328,886 which does not include the cost of land for realigned pipe that falls outside of the river boundary. The estimated cost does also not include emergency repairs that the Village may need to plan for during construction. The clay pipeline has been in service for 30 years and may be subject to further damage from construction activities. Such emergency costs can be covered on a time and materials basis over and above the cost of the contract.

7.3 Operations and Maintenance Costs

Maintenance costs will be minimal for the system during the initial years since the pipeline and manholes will be new construction. In general, maintenance on the pipeline will be minimal on a regular basis since the line flows by gravity and requires no power for pumping at lift stations. Maintenance of collection systems upstream of the joint use interceptor is critical in order to maintain the integrity of the hydraulic capacity of the renewed interceptor pipeline downstream.

7.4 Annual Operating Budget

A copy of the Village of Ruidoso's annual operating budget is included in Appendix B at the end of this report.

8.0 CONCLUSIONS AND RECOMMENDATIONS

8.1 Conclusions

- The July 2008 flood event impacted the performance and the hydraulic capacity of the Village's joint use interceptor pipeline between the Village-Downs boundary and the WWTP.

- Not all of the interceptor pipeline length was CCTV inspected as part of the inspection conducted by the Village after the flood because the pipeline was reported to be full of rocks and debris, and flows were too high for equipment.

- The interceptor pipeline has very high flows in sections of pipeline from infiltration and inflow from pipe and manhole damage caused by the flood.

- Lengths of pipeline are exposed as a result of erosion caused by the river changing its course.

- Manholes were submerged during the flood subjecting them to extreme groundwater cycle loading.

- Pipeline river crossings were compromised by the flood which widened the river channel and lowered the river bed. The US Army Corps of Engineers requires that

the interceptor pipeline river crossings have four feet of bury on top of the pipe installation to the bottom of the river bed.

- The interceptor pipeline must be mitigated to restore the pipeline to its pre-disaster condition. Such mitigation will include appropriate engineering codes and standards.
- Sections of pipeline that are rehabilitated using a CIPP lining system will see a small reduction in the host pipe diameter possibly reducing capacity over time however, the new pipe lining system will have an improved Manning's "n" value to improve velocity immediately.

8.2 Recommendations

- Thoroughly evaluate all manholes along the joint use interceptor pipeline during design phase to determine current condition and specific rehabilitation needs to mitigate the system.

- CCTV pipeline sections that were not inspected as part of the CCTV inspection conducted by the Village approximately three months after the flood. Select the most cost effective method for the conditions of the existing pipe and the long term pipeline applications.

- Require a CCTV inspection of the joint use interceptor pipeline annually.

- It is recommended that the Downs Racetrack wastewater collection system be cleaned in conjunction with the mitigation of the joint use interceptor. Both the collection system and the recently repaired and cleaned metering station should be maintained on a regular basis. Maintenance of the facilities will assure that the metering station is accurately measuring the flow from the track facility

- The collection system and wastewater metering station located in the Downs Racetrack is in need of maintenance, and repair. Site visits indicate that the system needs to be cleaned and the metering station that enters Village of Ruidoso joint-use interceptor manhole number 52 requires major repairs. It is critical that the metering station accurately measure the flow from the track facility

- The new WWTP Contract Drawings show that there is a new MH #2 inside the WWTP property line set over the existing pipeline and invert. Can Molzen-Corbin set that MH invert lower than, and independent of, the existing pipeline? Lowering the invert of the pipeline at the end near the WWTP will help lower the pipeline river crossing east of MH #6. (4 ft. min. required by USACE) If not, that crossing shall remain unchanged.

APPENDIX A

Estimated Construction Cost Breakdown

Alternative 1

No Action

Village of Ruidoso, New Mexico
Sewer Replacement - Village / Downs Boundary to WWTP

Opinion of Alternative 1 - No Action Construction Cost

Item	Description	Units	Quantity	Unit Cost	Amount
1	MH-29 TO MH-30				
2	Emergency repair after flood	LS	1	$2,000,000.00	$2,000,000
3	CCTV Cleaning - 2009	LF	26,400	$5.00	$132,000
	Sub-total page 1:				**$2,132,000**
	Sub-total:				$2,132,000
	NMGRT @ 7.8125%:				$166,563
	Total Construction Cost with NMGRT:				**$2,298,563**

Alternative 2

In-River Alignment

Village of Ruidoso, New Mexico
Sewer Replacement - Village / Downs Boundary to WWTP

Opinion of Alternative 2 - In-River Alignment Construction Cost

Item	Description	Units	Quantity	Unit Cost	Amount
1	Mobilization	LS	1	$ 100,000.00	$100,000
2	Construction staking	LS	1	$12,000.00	$12,000
3	**MH-70 TO MH-69**				
4	18" SAS pipe lining incl bypass,cleaning, pre & post TV	LF	400	$78.00	$31,200
5	Traffic control	days	1	$0.00	$0
6	4' dia. Manhole rehab 0' to 10' depth, incl. bench & channel, cip	EA	1	$2,932.50	$2,933
7	**MH-69 TO MH-66**				
8	18" SAS PVC C-900 pipe, incl trch, bf+c, cip	LF	1200	$45.00	$54,000
9	18" SAS clay pipe - abandon in place	LF	1000	$5.00	$5,000
10	New Manhole 0' to 10' depth, incl. rim & cover, cip	EA	3	$5,000.00	$15,000
11	By-pass pumping	days	2	$200.00	$400
12	Dewatering	days	5	$300.00	$1,500
13	Traffic control	days	1	$0.00	$0
14	**MH 66 TO MH 65**				
15	18" SAS pipe lining incl.bypass, cleaning, pre & Post TV	LF	600	$78.00	$46,800
16	Traffic control	days	1	$0.00	$0
17	Manhole 0' to 10' depth, incl. bench & channel, cip	EA	1	$2,932.50	$2,933
18	Manhole 0' to 18' depth, incl. bench & channel, cip	EA	1	$4,772.50	$4,773
19	**MH-65 TO MH-63**				
20	24" SAS PVC C-900 pipe, incl trch, bf+c, cip	LF	600	$58.00	$34,800
21	24" SAS clay pipe - abandon in place	LF	700	$5.00	$3,500
22	By-pass pumping	days	2	$200.00	$400
23	Traffic control	days	1	$0.00	$0
24	**MH-63 TO MH-XXA**				
25	21" SAS pipe lining incl.bypass, cleaning, pre & Post TV	LF	1350	$100.00	$135,000
26	Traffic control	days	3	$100.00	$300
27	Manhole 0' to 10' depth, incl. bench & channel, cip	EA	5	$2,932.50	$14,663
28	**MH-XXA TO MH-58**				
29	18" SAS pipe lining incl.bypass, cleaning, pre & Post TV	LF	1900	$78.00	$148,200
30	Traffic control	days	1450	$5.00	$7,250
31	Manhole 0' to 10' depth, incl. bench & channel, cip	EA	5	$2,932.50	$14,663
32	**MH-58 TO MH-57**				
33	18" SAS pipe lining incl. cleaning, pre & Post TV	LF	250	$78.00	$19,500
34	Traffic control	LS	1	$0.00	$0
35	Manhole 0' to 12' depth, incl. bench & channel, cip	EA	1	$3,392.50	$3,393
36	Manhole 0' to 18' depth, incl. bench & channel, cip	EA	1	$4,772.50	$4,773
37	**MH-57 TO MH-50**				
38	24" SAS pipe lining incl. cleaning, pre & post TV	LF	1725	$130.00	$224,250
39	Traffic control	days	3	$100.00	$300
40	4' dia. Manhole 0' to 8' depth abandon in place	EA	1	$50.00	$50
41	New manhole 0' to 8' depth, 6' diameter incl rim &cover, cip	EA	1	$6,000.00	$6,000
42	Manhole 0' to 10' depth, incl. bench & channel, cip	EA	4	$2,932.50	$11,730
43	Manhole 0' to12' depth, incl. bench & channel, cip	EA	1	$3,392.50	$3,393
44	Manhole 0' to 14' depth abandon in place	EA	1	$150.00	$150
45	New manhole 0' to 14' depth, 6' diameter incl rim &cover, cip	EA	1	$7,500.00	$7,500
46	Dewatering	days	5	$600.00	$3,000
47	24" SAS PVC C-905 pipe incl.trch, bf + c, cip	LF	300	$58.00	$17,400
	Sub-total page 1:				**$936,750**

Opinion of Alternative 2 - In-River Alignment Construction Cost

Item	Description	Units	Quantity	Unit Cost	Amount
52	MH-50 TO MH-44				
53	18" SAS pipe lining incl cleaning, pre & Post TV	LF	3100	$78.00	$241,800
54	Traffic control	days	4	$100.00	$400
55	4' dia. Manhole 0' to 10' depth, incl. bench & channel, cip	EA	4	$2,932.50	$11,730
56	New manhole 0' to 10' depth, 6' diameter incl rim & cover, cip.	EA	2	$6,000.00	$12,000
57	MH-44 TO MH-43				
58	21" SAS pipelining incl cleaning, pre & post TV	LF	500	$100.00	$50,000
59	4' dia. Manhole 0' to 12' depth, incl. bench & channel, cip	EA	1	$3,852.50	$3,853
60	MH-43 TO MH-41 (River Crossing No.2)				
61	21" SAS PVC C-900 pipe, incl trch, bf+c, cip	LF	650	$55.00	$35,750
62	21" DI carrier pipe at river crossing, restrained joint	LF	150	$55.00	$8,250
63	30" Steel casing at river crossing,spacers & end seals, cip	LF	150	$300.00	$45,000
64	New manhole 0' to 14' depth, 6' diameter incl rim &cover, cip	EA	2	$6,500.00	$13,000
65	New manhole > 18' depth, 6' diameter incl rim &cover, cip	EA	2	$10,000.00	$20,000
66	Dewatering	Days	28	$300.00	$8,400
67	Connection to exsiting system, cip	EA	2	$5,000.00	$10,000
68	21" SAS clay pipe - abandon in place	LF	1110	$5.00	$5,550
69	MH-41 TO MH-38				
70	21" SAS pipe lining incl. cleaning, pre & Post TV	LF	760	$100.00	$76,000
71	Traffic control	days	4	$50.00	$200
72	Manhole rehab 0' to 10' depth, incl. bench & channel, cip	EA	1	$2,932.50	$2,933
73	Manhole rehab 0' to 16' depth, incl. bench & channel, cip	EA	2	$4,312.50	$8,625
74	Manhole rehab 0' to 18' depth, incl. bench & channel, cip	EA	1	$4,772.50	$4,773
75	MH-38 TO MH-37				
76	15" SAS pipe lining incl cleaning, pre & Post TV	LF	300	$65.00	$19,500
77	Traffic control	days	1	$100.00	$100
78	Manhole 0' to 10' depth, incl. bench & channel, cip	EA	1	$2,932.50	$2,933
79	Manhole 0' to 12' depth, incl. bench & channel, cip	EA	1	$3,392.50	$3,393
80	MH-37 TO MH-33				
81	18" SAS pipe lining incl. cleaning, pre & post TV	LF	1450	$78.00	$113,100
82	Traffic control	days	2	$100.00	$200
83	Manhole rehab 0' to 10' depth, incl. bench & channel, cip	EA	7	$2,932.50	$20,528
84	MH-33 TO MH-31				
85	21" SAS pipe lining incl. cleaning, pre & Post TV	LF	600	$100.00	$60,000
86	Traffic control	days	1	$100.00	$100
87	Manhole rehab 0' to 10' depth, incl. bench & channel, cip	EA	2	$2,932.50	$5,865
88	MH-31 TO MH-30				
89	18" SAS pipe lining incl. cleaning, pre & Post TV	LF	300	$78.00	$23,400
90	Traffic control	days	1	$0.00	$0
91	Manhole rehab 0' to 8' depth, incl. bench & channel, cip	EA	1	$2,472.50	$2,473
92	MH-30 TO MH-27				
93	18" SAS PVC C-900 pipe, incl trch, bf+c, cip	LF	1200	$45.00	$54,000
94	18" SAS clay pipe - abandon in place	LF	1350	$5.00	$6,750
95	New manhole 0' to 10' depth, incl. rim & cover, cip	EA	2	$5,500.00	$11,000
96	By-pass pumping	days	2	$200.00	$400
97	Dewatering	Days	5	$300.00	$1,500
98	Traffic control	days	1	$0.00	$0
99	MH-27 TO MH-23				
100	21" SAS pipe lining incl. cleaning, pre & Post TV	LF	2300	$100.00	$230,000
101	Traffic control	days	2	$100.00	$200
102	Manhole rehab 0' to 8' depth, incl. bench & channel, cip	EA	1	$2,472.50	$2,473
103	Manhole rehab 0' to 12' depth, incl. bench & channel, cip	EA	2	$3,392.50	$6,785
104	Manhole rehab 0' to 14' depth, incl. bench & channel, cip	EA	1	$3,852.50	$3,853
105	MH-23 TO MH-22				
106	18" SAS pipe lining incl cleaning, pre & Post TV	LF	600	$78.00	$46,800
107	Traffic control	days	1	$0.00	$0
108	Manhole rehab 0' to 10' depth, incl. bench & channel, cip	EA	1	$2,932.50	$2,933
	Sub-total page 2:				**$1,176,547**

Opinion of Alternative 2 - In-River Alignment Construction Cost

Item	Description	Units	Quantity	Unit Cost	Amount
98	**MH-22 TO MH-20**				
99	21" SAS pipe lining incl. cleaning, pre & Post TV	LF	750	$100.00	$75,000
100	Traffic control	days	1	$0.00	$0
101	Manhole rehab 0' to 10' depth, incl. bench & channel, cip	EA	1	$2,932.50	$2,933
102	**MH-20 TO MH-17**				
103	15" SAS pipe lining incl. cleaning, pre & post TV	LF	450	$65.00	$29,250
104	Traffic control	days	1	$0.00	$0
105	Manhole rehab 0' to 10' depth, incl. bench & channel, cip	EA	1	$2,932.50	$2,933
106	**MH-17 TO MH-12**				
107	18" SAS pipe lining incl. cleaning, pre & post TV	LF	2250	$78.00	$175,500
108	Traffic control	days	1	$0.00	$0
109	Manhole 0' to 10' depth, incl. bench & channel, cip	EA	5	$2,932.50	$14,663
110	**MH-12 TO MH-10**				
111	18" SAS pipe lining incl. cleaning, pre & post TV	LF	750	$78.00	$58,500
112	Traffic control	days	1	$0.00	$0
113	Manhole 0' to 10' depth, incl. bench & channel, cip	EA	2	$2,932.50	$5,865
114	**MH-10 TO MH-7**				
115	18" SAS PVC C-900 pipe, incl trch, bf+c, cip	LF	1200	$45.00	$54,000
116	18" SAS clay pipe - abandon in place	LF	1200	$5.00	$6,000
117	New manhole 0' to 10' depth, incl. rim & cover, cip	EA	3	$5,000.00	$15,000
118	By-pass pumping	days	2	$200.00	$400
119	Dewatering	days	5	$300.00	$1,500
120	Traffic control	days	1	$0.00	$0
121	**MH-7 TO MH-6**				
122	15" SAS pipe lining incl. cleaning, pre & post TV	LF	650	$65.00	$42,250
123	Traffic control	days	1	$100.00	$100
124	Manhole 0' to 16' depth, incl. bench & channel, cip	EA	1	$4,312.50	$4,313
125	**MH6 TO WWTP**				
126	24" SAS pipe lining incl. cleaning, pre & Post TV	LF	1900	$130.00	$247,000
127	Traffic control	days	1	$0.00	$0
128	Manhole 0' to 10' depth, incl. bench & channel, cip	EA	5	$2,932.50	$14,663
	Sub-total page 3:				**$749,868**
	Sub-total:				$2,863,164
	Undefined elements @ 15%:				$429,475
	Construction contingencies @ 10%:				$286,316
	Sub-total:				$3,578,955
	NMGRT @ 7.8125%:				$279,606
	Total Construction Cost with NMGRT:				**$3,858,561**

Alternative 3

Out-of-River Alignment

Opinion of Alternative 3 - Out-of-River Alignment Construction Cost

Item	Description	Units	Quantity	Unit Cost	Amount
1	Mobilization	LS	1	$ 100,000.00	$100,000
2	Construction staking	LS	1	$10,000.00	$10,000
3	**MH-70 TO MH-69**				
4	18" SAS pipe lining incl bypass,cleaning, pre & post TV	LF	400	$78.00	$31,200
5	Traffic control	days	1	$0.00	$0
6	4' dia. Manhole rehab 0' to 10' depth, incl. bench & channel, cip	EA	1	$2,932.50	$2,933
7	**MH-69 TO MH-66**				
8	18" SAS PVC C-900 pipe, incl trch, bf+c, cip	LF	1200	$45.00	$54,000
9	18" SAS clay pipe - abandon in place	LF	1000	$5.00	$5,000
10	New Manhole 0' to 10' depth, incl. rim & cover, cip	EA	3	$5,000.00	$15,000
11	By-pass pumping	days	2	$200.00	$400
12	Dewatering	days	5	$300.00	$1,500
13	Traffic control	days	1	$0.00	$0
14	**MH 66 TO MH 65**				
15	18" SAS pipe lining incl.bypass, cleaning, pre & post TV	LF	600	$78.00	$46,800
16	Traffic control	days	1	$0.00	$0
17	Manhole 0' to 10' depth, incl. bench & channel, cip	EA	1	$2,932.50	$2,933
18	Manhole 0' to 18' depth, incl. bench & channel, cip	EA	1	$4,772.50	$4,773
19	**MH-65 TO MH-63**				
20	24" SAS PVC C-900 pipe, incl trch, bf+c, cip	LF	600	$58.00	$34,800
21	24" SAS clay pipe - abandon in place	LF	700	$5.00	$3,500
22	By-pass pumping	days	2	$200.00	$400
23	Traffic control	days	1	$0.00	$0
24	**MH-63 TO MH-XXA**				
25	21" SAS pipe lining incl.bypass, cleaning, pre & Post TV	LF	1350	$100.00	$135,000
26	Traffic control	days	3	$100.00	$300
27	Manhole 0' to 10' depth, incl. bench & channel, cip	EA	5	$2,932.50	$14,663
28	**MH-XXA TO MH-58A**				
29	18" SAS PVC C-900 pipe, incl trch, bf+c, cip	LF	2000	$48.00	$96,000
30	18" SAS clay pipe - abandon in place	LF	1450	$5.00	$7,250
31	By-pass pumping	days	3	$200.00	$600
32	Dewatering	days	5	$300.00	$1,500
33	Traffic control	days	1	$0.00	$0
34	4 ft. dia new precast 12 ft. depth, incl rim & Lid, cip	EA	5	$5,500.00	$27,500
35	**MH-58A TO MH-57**				
36	18" SAS pipe lining incl. cleaning, pre & Post TV	LF	250	$78.00	$19,500
37	Traffic control	LS	1	$0.00	$0
38	Manhole 0' to 12' depth, incl. bench & channel, cip	EA	1	$3,392.50	$3,393
39	Manhole 0' to 18' depth, incl. bench & channel, cip	EA	1	$4,772.50	$4,773
40	**MH-57 TO MH-50**				
41	24" SAS pipe lining incl. cleaning, pre & post TV	LF	1725	$130.00	$224,250
42	Traffic control	days	3	$100.00	$300
43	4' dia. Manhole 0' to 8' depth abandon in place	EA	1	$50.00	$50
44	New manhole 0' to 8' depth, 6' diameter incl rim &cover, cip	EA	1	$6,000.00	$6,000
45	Manhole 0' to 10' depth, incl. bench & channel, cip	EA	4	$2,932.50	$11,730
46	Manhole 0' to12' depth, incl. bench & channel, cip	EA	1	$3,392.50	$3,393
47	Manhole 0' to 14' depth abandon in place	EA	1	$150.00	$150
48	New manhole 0' to 14' depth, 6' diameter incl rim &cover, cip	EA	1	$7,500.00	$7,500
49	Dewatering	days	5	$600.00	$3,000
50	24" SAS PVC C-905 pipe incl.trch, bf + c, cip	LF	300	$58.00	$17,400
	Sub-total page 1:				**$897,488**

Opinion of Alternative 3 - Out-of-River AlignmentConstruction Cost

Item	Description	Units	Quantity	Unit Cost	Amount
52	**MH-50 TO MH-44**				
53	18" SAS pipe lining incl cleaning, pre & Post TV	LF	3100	$78.00	$241,800
54	Traffic control	days	4	$100.00	$400
55	4' dia. Manhole 0' to 10' depth, incl. bench & channel, cip	EA	4	$2,932.50	$11,730
56	New manhole 0' to 10' depth, 6' diameter incl rim & cover, cip.	EA	2	$6,000.00	$12,000
57	**MH-44 TO MH-43**				
58	21" SAS pipelining incl cleaning, pre & post TV	LF	500	$100.00	$50,000
59	4' dia. Manhole 0' to 12' depth, incl. bench & channel, cip	EA	1	$3,852.50	$3,853
60	**MH-43 TO MH-41 (River Crossing No. 2)**				
61	21" SAS PVC C-900 pipe, incl trch, bf+c, cip	LF	650	$55.00	$35,750
62	21" DI carrier pipe at river crossing, restrained joint	LF	150	$55.00	$8,250
63	30" Steel casing at river crossing,spacers & end seals, cip	LF	150	$300.00	$45,000
64	New manhole 0' to 14' depth, 6' diameter incl rim &cover, cip	EA	2	$6,500.00	$13,000
65	New manhole > 18' depth, 6' diameter incl rim &cover, cip	EA	2	$10,000.00	$20,000
66	Dewatering	Days	28	$300.00	$8,400
67	Connection to exsiting system, cip	EA	2	$5,000.00	$10,000
68	21" SAS clay pipe - abandon in place	LF	1110	$5.00	$5,550
69	**MH-41 TO MH-38**				
70	21" SAS pipe lining incl. cleaning, pre & Post TV	LF	760	$100.00	$76,000
71	Traffic control	days	4	$50.00	$200
72	Manhole rehab 0' to 10' depth, incl. bench & channel, cip	EA	1	$2,932.50	$2,933
73	Manhole rehab 0' to 16' depth, incl. bench & channel, cip	EA	2	$4,312.50	$8,625
74	Manhole rehab 0' to 18' depth, incl. bench & channel, cip	EA	1	$4,772.50	$4,773
75	**MH-38 TO MH-37**				
76	15" SAS pipe lining incl cleaning, pre & Post TV	LF	300	$65.00	$19,500
77	Traffic control	days	1	$100.00	$100
78	Manhole 0' to 10' depth, incl. bench & channel, cip	EA	1	$2,932.50	$2,933
79	Manhole 0' to 12' depth, incl. bench & channel, cip	EA	1	$3,392.50	$3,393
80	**MH-37 TO MH-33**				
81	18" SAS pipe lining incl. cleaning, pre & post TV	LF	1450	$78.00	$113,100
82	Traffic control	days	2	$100.00	$200
83	Manhole rehab 0' to 10' depth, incl. bench & channel, cip	EA	7	$2,932.50	$20,528
84	**MH-33 TO MH-31**				
85	21" SAS pipe lining incl. cleaning, pre & Post TV	LF	600	$100.00	$60,000
86	Traffic control	days	1	$100.00	$100
87	Manhole rehab 0' to 10' depth, incl. bench & channel, cip	EA	2	$2,932.50	$5,865
88	**MH-31 TO MH-30**				
89	18" SAS pipe lining incl. cleaning, pre & Post TV	LF	300	$78.00	$23,400
90	Traffic control	days	1	$0.00	$0
91	Manhole rehab 0' to 8' depth, incl. bench & channel, cip	EA	1	$2,472.50	$2,473
92	**MH-30 TO MH-27**				
93	18" SAS PVC C-900 pipe, incl trch, bf+c, cip	LF	1200	$45.00	$54,000
94	18" SAS clay pipe - abandon in place	LF	1350	$5.00	$6,750
95	New manhole 0' to 10' depth, incl. rim & cover, cip	EA	2	$5,500.00	$11,000
96	By-pass pumping	days	2	$200.00	$400
97	Dewatering	Days	5	$300.00	$1,500
98	Traffic control	days	0	$0.00	$0
99	**MH-27 TO MH-23**				
100	21" SAS pipe lining incl. cleaning, pre & Post TV	LF	2300	$100.00	$230,000
101	Traffic control	days	2	$100.00	$200
102	Manhole rehab 0' to 8' depth, incl. bench & channel, cip	EA	1	$2,472.50	$2,473
103	Manhole rehab 0' to 12' depth, incl. bench & channel, cip	EA	2	$3,392.50	$6,785
104	Manhole rehab 0' to 14' depth, incl. bench & channel, cip	EA	1	$3,852.50	$3,853
105	**MH-23 TO MH-22**				
106	18" SAS pipe lining incl cleaning, pre & Post TV	LF	600	$78.00	$46,800
107	Traffic control	days	1	$0.00	$0
108	Manhole rehab 0' to 10' depth, incl. bench & channel, cip	EA	1	$2,932.50	$2,933
	Sub-total page 2:				**$1,176,545**

Opinion of Alternative 3 - Out-of-River Alignment Construction Cost

Item	Description	Units	Quantity	Unit Cost	Amount
98	**MH-22 TO MH-20**				
99	21" SAS pipe lining incl. cleaning, pre & Post TV	LF	750	$100.00	$75,000
100	Traffic control	days	1	$0.00	$0
101	Manhole rehab 0' to 10' depth, incl. bench & channel, cip	EA	1	$2,932.50	$2,933
102	**MH-20 TO MH-17**				
103	15" SAS pipe lining incl. cleaning, pre & post TV	LF	450	$65.00	$29,250
104	Traffic control	days	1	$0.00	$0
105	Manhole rehab 0' to 10' depth, incl. bench & channel, cip	EA	1	$2,932.50	$2,933
106	**MH-17 TO MH-12**				
107	18" SAS pipe lining incl. cleaning, pre & post TV	LF	2250	$78.00	$175,500
108	Traffic control	days	1	$0.00	$0
109	Manhole 0' to 10' depth, incl. bench & channel, cip	EA	5	$2,932.50	$14,663
110	**MH-12 TO MH-10**				
111	18" SAS pipe lining incl. cleaning, pre & post TV	LF	750	$78.00	$58,500
112	Traffic control	days	1	$0.00	$0
113	Manhole 0' to 10' depth, incl. bench & channel, cip	EA	2	$2,932.50	$5,865
114	**MH-10 TO MH-7**				
115	18" SAS PVC C-900 pipe, incl trch, bf+c, cip	LF	1200	$45.00	$54,000
116	18" SAS clay pipe - abandon in place	LF	1200	$5.00	$6,000
117	New manhole 0' to 10' depth, incl. rim & cover, cip	EA	3	$5,000.00	$15,000
118	By-pass pumping	days	2	$200.00	$400
119	Dewatering	days	5	$300.00	$1,500
120	Traffic control	days	1	$0.00	$0
121	**MH-7 TO MH-6**				
122	15" SAS pipe lining incl. cleaning, pre & post TV	LF	650	$65.00	$42,250
123	Traffic control	days	1	$100.00	$100
124	Manhole 0' to 16' depth, incl. bench & channel, cip	EA	1	$4,312.50	$4,313
125	**MH6 TO WWTP**				
126	24" SAS pipe lining incl. cleaning, pre & Post TV	LF	1900	$130.00	$247,000
127	Traffic control	days	1	$0.00	$0
128	Manhole 0' to 10' depth, incl. bench & channel, cip	EA	5	$2,932.50	$14,663
	Sub-total page 3:				**$749,868**
	Sub-total:				$2,823,900
	Undefined elements during study & report phase @ 15%:				$423,585
	Construction contingencies @ 10%:				$282,390
	Sub-total:				$3,529,875
	NMGRT @ 7.8125%:				$275,771
	Total Construction Cost with NMGRT:				**$3,805,646**

APPENDIX B

Village of Ruidoso
Annual Operating Budget

Village of Ruidoso

Rate Structure 2009-10

VILLAGE OF RUIDOSO
RESOLUTION 2009-25

A RESOLUTION AMENDING THE VILLAGE OF RUIDOSO MUNICIPAL CODE OF ORDINANCES APPENDIX A, FEE SCHEDULE.

Whereas: Ordinance 2009-10 authorized amending Appendix A Fee Schedule by Resolution of Village Council; and,

Whereas: the Village wishes to adjust the rate structure for water, sewer and wastewater service,

NOW, THEREFORE BE IT ORDAINED BY THE GOVERNING BODY OF THE VILLAGE OF RUIDOSO THAT APPENDIX A BE AMENDED AS FOLLOWS:

[Deleted Text – ~~**Bold Strikeout**~~, New Text – **Bold Underlined**]

APPENDIX A FEE SCHEDULE

UTILITIES

Water rates:
(1) Metered service: The minimum monthly rate shall be adjusted annually, at the beginning of the fiscal year, using one-half the Consumer Price Index (CPI) as calculated and published by the state. The fees shown are for Fiscal Year 2007-2008. Minimum monthly charge--Metered service customer classifications 0 to 4,000 gallons:

RESIDENTIAL

Meter Size	Maintenance Fee	Capital Maintenance Fee	Base Rate	Total Min. Water Bill
All Sizes	3.07	3.35	14.44	20.86

COMMERCIAL

Meter Size (inches)	Maintenance Fee	Capital Maintenance Fee	Base Rate	Total Min. Water Bill
¾ **All Sizes**	3.07	3.35	18.64	25.06
~~1~~	~~3.07~~	~~3.35~~	~~35.32~~	~~41.74~~
~~1 1/2~~	~~3.07~~	~~3.35~~	~~35.32~~	~~41.74~~
~~2 and above~~	~~3.07~~	~~3.35~~	~~77.05~~	~~83.47~~

INDUSTRIAL or INSTITUTIONAL

Meter Size (inches)	Maintenance Fee	Capital Maintenance Fee	Base Rate	Total Min. Water Bill
¾ **All Sizes**	3.07	3.35	35.32	41.74
~~1~~	~~3.07~~	~~3.35~~	~~77.05~~	~~83.47~~
~~1 1/2~~	~~3.07~~	~~3.35~~	~~77.05~~	~~83.47~~
~~2 and above~~	~~3.07~~	~~3.35~~	~~118.78~~	~~125.20~~

1 1/2	3.07	3.35	77.05	83.47
2 and above	3.07	3.35	118.78	125.20

In addition, after the minimum monthly charge, all water used by customers within the village for any purpose shall be charged for as follows:

Residential commodity charges:

2.00 per 1,000 gallons for water usage in excess of 4,000 gallons up to and including 25,000 gallons.

4.00 per 1,000 gallons for water usage in excess of 25,000 gallons up to and including 35,000 gallons.

8.00 per 1,000 gallons for water usage in excess of 35,000 gallons up to and including 55,000 gallons.

16.00 per 1,000 gallons for water usage in excess of 55,000 gallons up to and including 75,000 gallons.

32.00 per 1,000 gallons for water usage in excess of 75,000 gallons up to and including 100,000 gallons.

64.00 per 1,000 gallons for water usage in excess of 100,000 gallons.

Commercial, industrial and institutional commodity charges:

2.00 per 1,000 gallons for water usage in excess of 4,000 gallons up to and including 25,000 gallons.

2.75 per 1,000 gallons for water usage in excess of 25,000 gallons up to and including 55,000 gallons.

3.50 per 1,000 gallons for water usage in excess of 55,000 gallons up to and including 75,000 gallons.

4.25 per 1,000 gallons for water usage in excess of 75,000 gallons up to and including 100,000 gallons.

5.00 per 1,000 gallons for water usage in excess of 100,000 gallons up to and including 125,000 gallons.

5.75 per 1,000 gallons for water usage in excess of 125,000 gallons up to and including 150,000 gallons.

6.50 per 1,000 gallons for water usage in excess of 150,000 gallons, up to and including 1,000,000 gallons.

18.75 per 1,000 gallons for water usage in excess of 1,000,000 gallons. Governmental, medical and other facilities as defined by village council are exempt from this commodity charge, with a maximum charge of $6.50 per 1,000 gallons.

Summer conservation surcharges of 2.00 per 1,000 gallons for all usage of 15,000 gallons and over will be billed for water during the months of April through September for residential, commercial, industrial and institutional water users. This charge shall be in addition to all commodity charges listed herein.

(2) Unmetered fire protection service. Unmetered service rates apply for service connections to the utility for private fire protection. These rates are applicable to all service through which water is used solely for extinguishing accidental fires.

Fixed monthly charge, unmetered service:

(Subsequent Text to Sewer Service Rates Remain Unchanged)

Sewer service rates:

(1) Metered sewer service and sewer standby charges: The minimum monthly rate shall be adjusted annually, at the beginning of the fiscal year, using the Consumer Price Index (CPI) as calculated and published by the state. The fees shown are for Fiscal Year 2007-2008.

(2) Minimum monthly charge per service unit:

Water Meter Size (inches)	Residential	Commercial	Institutional or Industrial
~~¾~~ **All Sizes**	14.27	20.75	27.22
~~1~~	~~20.75~~	~~27.22~~	~~40.19~~
~~1½~~	~~27.22~~	~~33.70~~	~~59.62~~
~~2 and above~~	~~27.22~~	~~59.62~~	~~92.04~~

(3) Commodity charge. In addition, after the minimum monthly charge, customers shall be charged 0.75 per 1,000 gallons of water used in excess of 4,000 gallons, as determined by the meter reading for water.

(4) Sewer customers without municipal water service:

Minimum monthly charge per service unit:	
Inside municipal limits:	
Residential customers	17.70
Commercial customers	24.03
Institutional and industrial customers	36.66
Outside municipal limits:	
Residential customers	~~35.40~~ **22.13**
Commercial customers	~~48.06~~ **30.04**
Institutional and industrial customers	~~73.32~~ **45.83**
Commodity charge. In addition to the minimum monthly charge, sewer customers without municipal water service shall be charged an amount equal to 0.75 per 1,000 gallons of liquid waste discharged in excess of 4,000 gallons for all sewer customers.	
Sewer standby charge	16.44 per month
Penalty for delinquent account	1% per month
Dye test (for sewer hook-up verification)	50.00 each

Wastewater treatment rates:

(1) The minimum monthly rate shall be adjusted annually, at the beginning of the fiscal year, using the Consumer Price Index (CPI) as calculated and published by the state. The fees shown are for Fiscal Year 2007-2008.

~~(2) Minimum monthly charge per service unit:~~

Water Meter Size (inches)	Residential	Commercial	Institutional or Industrial
~~¾~~ **All Sizes**	32.58	47.36	62.14
~~1~~	~~47.36~~	~~62.14~~	~~81.53~~
~~1½~~	~~62.14~~	~~81.53~~	~~106.97~~
~~2 and above~~	~~62.14~~	~~136.11~~	~~210.12~~

(3) Commodity charge. In addition, after the minimum monthly charge, customers shall be charged 1.80 per 1,000 gallons of water used in excess of 4,000 gallons, as determined by the meter reading for water.

(4) Wastewater treatment customers without municipal water service:

Minimum monthly charge per service unit:	
Inside municipal limits:	
Residential customers	40.41
Commercial customers	54.86
Institutional and industrial customers	83.70
Outside municipal limits:	
Residential customers	~~80.83~~ 50.51
Commercial customers	~~109.72~~ 68.58
Institutional and industrial customers	~~167.40~~ 107.63
Commodity charge. In addition to the minimum monthly charge, sewer customers without municipal water service shall be charged an amount equal to 1.80 per 1,000 gallons of liquid waste discharged in excess of 4,000 gallons for all sewer customers.	
Tank truck discharge to wastewater treatment plant	1.00 per gallon

EFFECTIVE DATE:

This Resolution shall take effect on the 30th of June, 2009.

Passed, Approved, and Adopted this 23rd day of June, 2009.

Lonnie R. Nunley, Mayor

(SEAL)
ATTEST:

Irma Devine, Village Clerk

FILE:C:\DOCUMENTS AND SETTINGS\WILLIAM MORRIS\MY DOCUMENTS\DEPARTMENT ISSUES\WATER UTILITIES\RESOLUTION 2009-25 APPENDIX A.DOC

Village of Ruidoso

Revenue and Expenditures for FY 2009

RPRISE FUND(S) - REVENUE AND EXPENDITURES FOR FY 200

County/Municipality:
Village of Ruidoso

UTILITY FUND
02 (500)
220

~~UTILITY FUND - SEWER~~ BUDGET LINE ITEM DESCRIPTION	ACCOUNT CODE	FINAL APPROVED ~~FY 09/10 BUDGET~~ APPROVED ON July 28, 2009
REVENUES		
Sewer Service	31201	1,417,000
Sewer Taps	31202	4,000
Sewer Hole Tap Fee	31203	300
Sewer Miscellaneous	31205	
Sewer Dye Tests	31206	300
TOTAL REVENUE		**$1,421,600**
TRANSFERS to/from GENERAL FUND		
Transfer to General Fund (01) (Indirect Costs)	40001	(106,620) 7.5%
Transfer to General Fund (01) (Mgmt Salary)	40001	(5,434)
Transfer to 2008 Flood Fund (28)	40028	(342,229)
Transfer to Internal Service Fund (40) (BM)	40040	(43,766)
Transfer to Internal Service Fund (40) (IT)	40040	(4,567)
Transfer to Internal Service Fund (40) (PW)	40040	(53,338)
GRAND TOTAL REVENUES		**$865,646**

EXPENSES

SALARIES & BENEFITS		
Full-time Position Salaries	71100-1	209,684
Part-time Position Salaries	71100-2	
Temporary Position Salaries	71100-4	
Overtime Salaries	71100-3	9,000
Stand-By Pay	71100-6	6,000
FICA (Social Security and Medicare)	71101	17,188
PERA (Public Employees Retirement Assoc.)	71102	28,412
Group Insurance (Health, Dental, Vision, Life)	71103	39,737
Workers' Compensation (Ins. Prem. and Fee)	71104	14,384
Unemployment Claims	72207-2	

TOTAL SALARIES & BENEFITS		$324,405

OPERATING EXPENSES		
Ads and Publications	72201	500
Training and Development	72203-2	
Engineering Services	72203-7	30,000
Required Physicals	72203-10	400
Dues and Subscriptions	72204	
Insurance	72207	40,000
Equipment Maintenance & Repair	72210	18,000
Postage	72212	500
GRT Tax Payments	72213-9	
Uniform Laundry	72215	4,000
Travel Costs (Mileage/Per Diem/Actual)	72219	5,000
Utilities-Electric, Propane, Cable, Gas, Oil, Etc	72221	5,000
Vehicle Maintenance	72222	5,000
Fuel-Gasoline & Diesel	72223	10,000
Safety Equipment	72238	1,500
Chemicals	72241	6,000
Treatment of Sewage	72245	
Shop Tools	72259	5,000
Alcohol & Drug Testing	72273	
Sewer Collection Maintenance	72292	15,000
Damaged Property	72294-1	500
TOTAL OPERATING EXPENSES		**$146,400**

RPRISE FUND(S) - REVENUE AND EXPENDITURES FOR FY 200

County/Municipality:
Village of Ruidoso

UTILITY FUND
02 (500)
220

UTILITY FUND - SEWER BUDGET LINE ITEM DESCRIPTION	ACCOUNT CODE	FINAL APPROVED FY 09/10 BUDGET APPROVED ON July 28, 2009
CAPITAL PURCHASES		
Capital Outlay-Vehicles	76325	55,000
Capital Outlay-Equipment	76340	330,000
Capital Outlay-Projects/Construction	76500	125,000
Capital Outlay-Lease Purchase (Backhoe)	77262	11,000
TOTAL CAPITAL PURCHASES		**$521,000**

SUMMARY BUDGET FOR LITY FUND - SEW

TOTAL SALARIES & BENEFITS		324,405
TOTAL OPERATING EXPENSES		146,400
TOTAL CAPITAL PURCHASES		521,000
TOTAL EXPENDITURE BUDGET		**$991,805**

Village of Ruidoso

Debt Service

Village of Ruidoso, New Mexico					
Debt Service Funds Summary (December 2009)					
Debt Service	Amount Left	Revenue	Payment/Year	Matures	Comments
General Obligation Bond (GO)	$0		$9,720 per year	4/9/2009	The original note $1,270,000 was paid off April 1, 2009
Revenue Bond	$2,196,500	$2,000,000	$131,335 per year	8/1/2031	