

INFRASTRUCTURE CAPITAL IMPROVEMENT PLAN
FOR WATER, WASTEWATER, AND ROADWAY
(Revised March 18, 2008)

The objective of this plan is to identify areas of need within the existing water, wastewater and roadway infrastructure and the need for the installation of new infrastructure to serve annexed areas where services are not currently available or areas where growth is anticipated. This plan will also establish priorities for the Governing Body to consider. This ICIP will consider the following factors:

- age and condition of existing infrastructure components
- current capacity and future demand on existing
- expected growth
- previous improvement plans

Infrastructure components to be addressed by this plan include:

1. Municipal Water System
2. Municipal Wastewater System
3. Double Eagle Water System
4. Municipal Roadway System

MUNICIPAL WATER SYSTEM

The Carlsbad Municipal Water System is owned and operated by the City of Carlsbad. In addition to the city, the system serves the community of La Huerta. The different facilities in the system and their needs are addressed as follows:

1. Water Producing Wells

The Sheep's Draw Well Field consists of a total of nine (9) producing wells. Three (3) other wells had been drilled, but the wells have not been equipped nor connected to the water system. The well field is located approximately 7.0 miles southwest of the city. The following improvements are needed at the well field:

A. Well No. 6 has been down for some time. The well hole appears to be crooked and cannot be equipped with a turbine pump as the other eight wells. The well was equipped with a submersible pump, but the pump kept burning up every other year in spite of very little use. An evaluation of the conditions of the well is to be conducted by a qualified geohydrologist to determine if a new well needs to be drilled or if the existing well can be utilized and the pumping equipment modified. If the study concludes that a new well needs to be drilled, this new well will be furnished with new equipment.

The cost of drilling and equipping a new Well No. 6 is estimated at \$1,441,358.00.

B. Other city wells. In addition to Well No. 6, there are eight (8) other producing wells in the Sheep's Draw Wellfield. Most of the equipment in these wells dates back to the 1960's when the wellfield was brought in-line. Throughout the years the city has pulled, serviced, replaced, or re-built components to keep these wells in operating condition. Previous upgrades have included re-building motors and pumps, replacing sections of the column pipe and shaft, and replacing electrical controllers. All eight (9) wells are in need of the same upgrades at this time.

It is recommended to upgrade these wells at an estimated cost of \$1,200,000.00.

C. Well No. 10. The new Well No. 10 will be drilled by the U.S. Bureau of Reclamation under the Reclamation States Emergency Drought Act of 1991 at no cost to the city. It has been determined that a new borehole will need to be drilled adjacent to the existing Well 10, which was found to be crooked and un-useable. Well 10 site is located approximately 1.4 miles from the existing collector line at Well No. 9, so the extension of the gathering line is part of this project.

Plans and specifications for drilling this well have been completed. The project also includes extending the powerline to the Well 10 site and installing a diesel generator as a secondary power supply.

The city's cost to equip Well 10 and to extend the gathering line is estimated at \$3,409,754.00.

2. Transmission Waterlines

Water from the Sheep's Draw Well Field is piped into town via two different transmission lines. The north loop transmission waterline, 33 to 36 inches in size and approximately 30,000 feet long starts at Reservoir No. 4, located at Sheep's Draw Well Field and ends at Reservoir No. 2, located at the west end of Holland Street. The south loop transmission waterline, 30 inches in size and approximately 65,000 feet long, begins at Reservoir No. 4 and ends at Plaza Street Pressure Reducing Station located at San Jose Blvd and Plaza Street.

A. North loop transmission waterline. This transmission line is more than 40 years old and has experienced several leaks throughout the years. Other than these leaks, which have occurred in the same location, the pipeline appears to be in good condition. It is recommended, however, that the line be inspected for leaks and sections of the line to be found in bad condition be replaced together with the section of line previously repaired. It is also recommended that new isolating valves and air relief valves be installed along the 5.7 miles of pipeline to facilitate future repairs and the proper operation of the line.

The cost of these improvements is estimated at \$409,202.00.

B. South loop transmission waterline. This transmission line was completed in December 2004 and has been in operation since without any major problems. No upgrades are anticipated at this time.

3. Storage Tanks

There are a total of three (3) 5 million gallon tanks and one (1) million gallon tank in the system. The two older 5 million gallon structural concrete tanks (Reservoirs 1 and 2) and the 1 million gallon metal tank (Reservoir No. 3) appear to be in good condition. It is necessary, however, to have these tanks cleaned and inspected to make a determination as to their condition. Needed repairs can be performed while each tank is off-line for clean up and inspection, or at a later date. It is recommended that the city proceed with the clean up and inspection of all three tanks and that necessary repairs be done while the tanks are off-line.

The cost of clean up, inspection and potential repairs to all three (3) tanks is estimated at \$96,368.00.

4. Distribution Lines

The existing distribution network consists of approximately 670 miles of pipeline ranging from 1 inch to 33 inches in size. The main components include a high pressure loop line and 12 inch to 6 inch diameter pipeline grid. The city must continue the installation of the high pressure loop around the city and the 12 inch, 8 inch, and 6 inch grid system in areas already fully developed and in areas currently under development or fixing to be developed.

A. High Pressure Loop. The high pressure loop waterline currently extends north from Reservoir No. 2 (West Holland Street) to University pressure reducing station (Pierce Street and University Drive) via a 36 inch, 33 inch, and a 14 inch diameter pipeline.

Rapid growth and low water pressure complaints in the La Huerta area necessitate for this section of pressure line to be extended north across the Pecos River, east along Callaway Drive and Cherry Lane to Canal Street, a distance of 13,800 feet.

The cost of installing a new 20 inch diameter pipeline is estimated at \$3,622,282.00.

The high pressure loop also extends from Standpipe Road to Plaza Pressure Reducing Station (San Jose Blvd. and Plaza Street) via a 24 inch and 20 inch diameter pipeline, and also from the Airport Pressure Reducing Station (National Parks Hwy at the Airport) north along National Parks Highway and San Jose Blvd. to Plaza Pressure Reducing Station via a 30 inch diameter pipeline.

B. Pipeline Grid system. The pipeline grid system is deficient in some sectors of the city where recent annexations have occurred or where the existing pipelines are not large enough to accommodate current demand. Recommended improvements to the pipeline grid are:

1. West San Jose Street/Elgin Road, 12 inch diameter waterline - Current growth along Old Cavern Highway, Thomason Road, and Chapman Road requires for the 12 inch pipeline grid to be extended from National Parks Highway east along San Jose Street and Elgin Road to Thomason Road.

The cost of this improvement is estimated at \$1,630,382.00.

2. South Eighth Street, 12 inch diameter waterline - A new 12 inch diameter waterline is also needed along Eighth Street from Lea Street to Texas Street. The existing 8 inch diameter waterline

along Eighth Street experiences significant pressure losses, which reduces the available water pressure along Lea Street and adversely impacts fire protection in the area.

The cost of this extension of the 12 inch grid system is estimated at \$500,578.00.

3. West Lea Street, 12 inch diameter waterline - The 12 inch pipeline grid also needs to be extended along West Lea Street from Eleventh Street west across Happy Valley Road (NM 524) intersection. This improvement will replace a sub-standard 2 inch waterline which serves residences along West Lea Street and Fourteenth Street, and provide much needed water pressure and fire protection in the area. A point of connection to the Happy Valley Water System will also be provided by this project. This connection will to be used in case of an emergency.

This improvement is funded through the West Lea Street Reconstruction Project soon to be under design. It is anticipated that additional funding will not be required to complete this waterline extension.

4. National Parks Highway, 12 inch diameter waterline – The existing 12 inch diameter waterline located along the east side of National Parks Highway needs to be extended south from Airport Road to the city limits at Derrick Road. The installation of this waterline will facilitate the development of vacant land located across the industrial park and municipal airport. The proposed work calls for the installation of 6,260 lineal feet of 12 inch diameter waterline.

The cost of this expansion is estimated at \$914,607.00.

C. Sub-Standard Lines. Some areas of the grid include waterlines 1 inch to 3 inches in size, which are too small to meet current demand. Some of these small lines dead end lines which provide inadequate service to a large number of residences. These waterlines do not meet current demand and must be replaced.

The approximate length of these substandard waterlines by size is as follows:

1.0 inch diameter	600 lineal feet
1.5 inch diameter	1,600 lineal feet
2.0 inch diameter	17,315 lineal feet
3.0 inch diameter	<u>25,520 lineal feet</u>
Total	45,035 lineal feet

It is recommended that these waterlines be replaced with 6 inch diameter, PVC pipe at an estimated cost of \$4,503,500.00.

D. Existing Lines in Deteriorating Condition. Some waterlines are large enough to meet current demand, but their condition is deteriorating due to the corrosivity of the soils they are found in, as in the case of steel and cast iron lines, or due to age, shallow pipe depth or heavy traffic load some lines are subjected to. These lines have experienced numerous breaks in recent years. It is recommended that the following lines be replaced:

a. North Canal Street Waterline. Replace 8,900 feet of 8 inch diameter asbestos-cement (A.C.) waterline and 9,180 feet of 4 inch diameter A.C. waterline. The lines to be replaced extend from Pompa Street to the North Y. This segment of Canal Street is scheduled for roadway reconstruction in 2009 and replacement of these lines now will avoid future damage to the new roadway.

The cost of replacement of these two lines is estimated at \$1,486,357.00.

b. North Canyon Street Waterline. The project calls for the replacement of 1,300 feet of 8 inch diameter A.C. waterline and 1,300 feet of 4 inch diameter A.C. waterline from Hagerman Street to Church Street.

The total cost of this replacement is estimated at \$404,815.00.

c. Juanita Street Waterline. Replace 580 feet of 4 inch diameter A.C. waterline along Juanita Street from South James Street to Nelson Street.

The cost of replacing this line is estimated at \$79,800.00.

d. Westridge Road Waterline. Replace 2,000 feet of 4 inch diameter A.C. waterline along Westridge Road from the 1300th block to the 1600th block.

The cost of the new 6 inch line is estimated at \$242,968.00.

e. Steel and Cast Iron Waterlines. Replace approximately 8,600 feet of 6 inch diameter steel lines and 1,030 feet of 6 inch diameter cast iron lines at different locations within the city limits.

The cost of replacing these lines is estimated at \$963,000.00.

5. Pressure Reducing Stations and Booster Pump Stations

There are a total of seven (7) pressure reducing stations and three (3) booster stations in the water system. The pressure reducing stations were either installed new or retrofitted in 2004. No work on the pressure reducing stations is anticipated at this time.

The Reservoir No. 1 Booster Station which pumps water to Reservoir No. 3 on Skyline Road and into the water system needs to be retrofitted. Upgrades are to include the replacement of pumps and electrical controllers. Upgrades to the electrical service upgrades are also needed.

The cost of these improvements is estimated at \$237,200.00.

6. Isolating Valves

Numerous isolating valves are either non-operational or cannot be found because they have been paved over. The total number of valves in need of repair or replacement is not known because the Water Department has never had the personnel to dedicate to this task. Without this information it is not possible to determine the magnitude of this problem. This is a task that can best be completed by Water Department personnel since they have the knowledge of the system any contractor will rely on to accomplish the job.

This task will require for three (3) new positions to be funded under the annual budget at an estimated cost of \$190,000.00.

7. Fire Hydrants

There are 850 fire hydrants in the system. 825 of these fire hydrants are operational and only 25 hydrants are awaiting repair or replacement.

The Water Department has initiated a program by which old hydrants for which parts are becoming difficult to find, will be replaced instead of repaired. Part of this program is the standardization to two different brands of fire hydrants to make it easier for the warehouse to keep spare parts and complete hydrants in stock, readily available for use.

No added funds are needed to repair or replace the 25 hydrants on the waiting list.

8. Water Meters

There are a total of 10,750 meters in the system. A total of 6,250 meters have been replaced with the new pro-read meter which allows for meters to be read by tapping a transmitter installed in the meter can lid. The information is transmitted to and stored in hand-held computers and later downloaded directly to the main computer at City Hall. A total of 1,110 meters in stock at the warehouse remain to be installed. Once these meters are installed, an additional 4,500 units will need to be purchased to complete the meter automation.

Since the meter automation project began, a new technology has emerged. This new technology utilizes a radio transmitter to send data from the meter to either a mobile data collector or to a stationary collector. This new system is compatible with the touch-read system, so only the meter register needs to be retrofitted or replaced on the touch-read units. It is recommended to upgrade to radio-read units when ordering the additional 4,500 units.

The cost of the additional 4,500 new units is estimated at \$1,337,643.00. The units already installed and the units in stock can be upgraded to radio-read for an estimated cost of \$1,030,400.00.

The installation of the meters in stock or meters yet to be purchased cannot be completed under the current work load and staffing levels, more personnel will be needed to dedicate to this task. It is recommended instead to hire a contractor to complete the project in approximately 6 months at an estimated cost of \$555,000.00.

9. Supervisory Control and Data Acquisition (SCADA) System

The original SCADA system was installed in 1995. The original equipment will be discontinued at the end of this year and parts will no longer be available from the manufacturer, so the choices are either to update the current Bristol-Babcock equipment or to discard it and purchase new equipment from a different vendor.

The system on hand is the system more commonly used by other communities, some of which have already selected to update their current SCADA equipment rather than to switch to new equipment.

Based on the above, it is recommended that the current Bristol-Babcock hardware and software be upgraded at an estimated cost of \$102,500.00.

10. Water System Planning

The last water system master plan was prepared more than 12 years ago in 1995. A new updated plan needs to be commissioned as soon as possible before this infrastructure improvement effort is implemented. The new master plan shall:

- Update the water system map based on the GIS system recently implemented.
- Evaluate all the components of the water system.
- Address future growth.
- Address system expansion to incorporated areas and areas adjacent to the city.
- Create a new model or update the existing hydraulic model of the system.
- Prepare an implementation plan and provide cost estimates.

The cost of the Water System Master Plan is estimated at \$220,000.00.

MUNICIPAL WASTEWATER SYSTEM

1. Sewer Master Plan

The last sewer master plan was completed in May 1997 as an update to the 1976 Wastewater Treatment and Collection Facilities Plan. The 1997 plan addressed only the city's major interceptors, lift stations, and groundwater infiltration in the sewage collection system. There is the need today for the development of a comprehensive sewer master plan for the city and adjacent communities. This plan will:

- update sewer collection system maps
- evaluate all sewer system components
- address expansion to incorporated areas and areas adjacent to the city not currently served by sewer
- address future growth
- create a hydraulic model of the sewer system
- prepare an implementation plan and provide cost estimates

The cost of the Sewer Master Plan is estimated at \$215,000.00.

2. Sewer Interceptors

Some sewer interceptors have been identified to be at capacity to handle current flows or inadequate to accommodate future flows. These interceptors include the following:

A. Interceptor 120 from Kircher Street north across the CID Canal to Wood Avenue, a distance of 3,210 lineal feet. This 10 inch diameter interceptor needs to be upgraded to 12 inches in size.

The cost of this upgrade has been approved for inclusion under the current budget.

B. Interceptor 119. This 10 inch diameter interceptor extends along Old Cavern Highway from Farris Street north across National Parks Highway to the beginning of interceptor 120 at Kircher Street. This interceptor is approximately 3,000 feet long and currently reaches its maximum capacity at peak flow. This condition will worsen as additional sewer lines are added south of Farris Street. It is recommended that this interceptor be upgraded to 12 inches in size.

The cost of this upgrade is estimated at \$539,950.00.

C. Jefferson Street east alley sewer line. This 10 inch diameter sewer line has not been designated as an interceptor, but it needs to be upgraded to handle current and future additional flow from new development north of Callaway Drive. It is recommended that this line, approximately 1,060 feet in length, be upgraded to 12 inches in size.

The cost of this upgrade is estimated at \$161,429.00.

3. Sewer Collector Lines

The majority of the existing collector lines are made out of clay tile and more than 40 years old. Some sewer line sections show to be egg shaped, or slightly off of vertical or horizontal alignment. Sewer lines also exhibit leaky pipe joints and longitudinal and circumferential cracking, which allows groundwater to infiltrate the pipe. The 2001 Sewer Line Improvement Project addressed the lines in the worst condition. These lines were all located west of the Pecos River and east of Canal Street. The project consisted of repairing or replacing the most severely damaged pipe sections and installing a PVC liner inside the entire length of the sewer line.

The replacement of all aging sewer lines is not economically feasible, so lines in need of repairs must be identified by testing for groundwater infiltration and by cleaning and video taping. Based on data collected prior to the 2001 project, other lines located nearby the Pecos River need to be scheduled for cleaning, video taping, and repairs.

The estimated cost of this work is \$1,734,000.00.

A sampling, cleaning, and video taping program to identify and prioritize future sewer line repairs will be initiated. It is requested that \$100,000.00 be budgeted for sewer line repairs every fiscal year starting with FY 2009/2010.

4. Sewer Manholes

Most of the existing brick manholes in the city exhibit signs of deterioration and structural failure due to corrosion and age. Most of these manholes are more than 40 years old. Repairs to existing manholes can be done separately or in conjunction with repairs to the sewer lines. It is estimated that there are approximately 200 manholes in need of immediate repair in the sewer collection system. The repair of these manholes is highly recommended.

The cost of repairs to 200 sewer manholes is estimated at \$486,000.00.

It is also recommended to enter into an annual contract for manhole repairs. It is requested that a minimum of \$100,000.00 be budgeted for manhole repairs every fiscal year starting with FY 2009/2010.

5. Sewer Lift Stations

There are currently thirteen (13) regional lift stations and one (1) central lift station in the sewer system. Four (4) of these stations were recently installed and three (3) other stations, including the Primary Lift Station, have been replaced with a new station or completely renovated. However, replacement parts for the Variable Frequency Drives (VFD's) at the Primary Lift Station are no longer available, so the frequency drives must be replaced.

The remaining seven (7) lift stations are in need of replacement. None of the remaining stations complies with the current "confined space" OSHA regulations.

Five (5) of these stations have reached the 20 year useful life. The remaining two (2) stations are already 17 years old and have begun to show signs of corrosion on the structure and electrical system. The replacement of the Primary Lift Station VFD's and the replacement cost of each lift station, in order of priority, are estimated as follows:

• Primary Lift Station VFD's	\$ 258,000.00
• La Huerta Lift Station	1,770,000.00
• Belva Lift Station	491,550.00
• Pate Street Lift Station	504,000.00
• Stevens Street Lift Station	481,400.00
• Hagerman Lift Station	495,700.00
• Hall Street Lift Station	486,000.00
• Bataan Bridge Lift Station	630,750.00
Total Estimated Cost for Lift Station Improvements:	\$5,117,400.00

6. Sewer System Extensions

The following sewer line extensions are needed to accommodate future growth within the city and to address potential nitrate contamination to shallow domestic wells, in one particular area of the city and in the adjacent unincorporated areas.

A. Northwest Region. This region is located south of Church Street, north of Lea Street, west of Eleventh Street, and east of Happy Valley Road (NM 524). The proposed work for this area includes the extension of interceptor 112 west along Lea Street to the city limits. This interceptor will provide gravity sewer service for further development north of Lea Street. The proposed extension of interceptor 112 is included with the West Lea Street Reconstruction Project from Standpipe Road west to the Happy Valley Road intersection. No other cost is anticipated at this time.

B. Southwest Region. This area is located along Standpipe Road south of Martin Lane, north of Herzog Street and east of Pearl Street. High levels of nitrate contamination have been found in shallow domestic wells in this area. The sewer work proposed for this area includes the installation of new interceptors (Interceptors 211, 212, and 213) along Standpipe Road and Radio Blvd. and the installation of a new lift station and forcemain.

The cost of the work is estimated at \$1,579,500.00.

C. Southern Region. This area is located east and west along Old Cavern Highway from Farris Street south to Chapman Road. The proposed work includes the extension of interceptor 219 along Old Cavern Highway, the installation of a regional lift station at the east end of Elgin Road and the installation of a sewer line along Elgin Road. The costs associated with the proposed improvements are estimated as follows in order of priority:

• Extension of Interceptor 219	\$1,314,000.00
• Elgin Road Lift Station and Forcemain	\$ 762,000.00
• Elgin Road Sewer	\$ 565,737.00

D. National Parks Highway sewer. The area located along the east side of National Parks Highway south of Chapman Road is not currently served by sewer. The proposed work includes the installation of 12 inch diameter interceptor 222 along the east side of National Parks Highway from Chapman Road south to the city limits at Derrick Road, a distance of 9,100 lineal feet.

The cost of this work is estimated at \$822,798.00.

Also needed are extensions of the sewer system into communities located in the county, but immediately adjacent to the city. Extending the sewer system into these areas will help to protect groundwater resources in the region and may be required by the state in the future. These extensions include the following:

A. La Huerta Sewer Improvements - located adjacent to the city's northern boundary, La Huerta is a community of approximately 700 households, according to the city's water meter records. La Huerta is part of the city's Municipal Water System. The proposed sewer works for La Huerta include the installation of a new interceptor (Interceptor 201) along North Canal Street from Grapevine Street north to Grassburr Lane and the installation of a new sewer lift station and forcemain to be located near the intersection of Orchard Lane and Mission Avenue.

The cost of the proposed work is estimated at \$2,711,500.00.

B. Happy Valley Sewer Extension – Happy Valley, a small community of approximately 200 households according to water meter records, is located along Happy Valley Road (NM 524), west of the city. This community is served drinking water by the Happy Valley Water Cooperative. Eddy County received \$300,000.00 from the 2008 CDBG Colonias Program for sewer works in this community.

The proposed work includes the installation of a new east-west interceptor (interceptor 208) along Hackberry Draw and a north-south interceptor (interceptor 209) to be located along Clayton Road. Interceptor 208 will tie-in to the west end of interceptor 112 and interceptor 209 will tie-in to interceptor 208. Also included in the proposed work is the installation of collector lines along the different streets in the community.

The cost of the work is estimated at \$2,142,303.00.

C. Big Sky Sewer Extension – The Big Sky neighborhood is located north and south of Hidalgo Road and west of Mescalero Street. This neighborhood of approximately 150 households is served drinking water purchased from the city’s Municipal Water System through Otis Water Coop. The area is bound by the city on all sides except the north. The proposed sewer work for this area includes the installation of new sewer collector lines along the different streets. These collectors will tie-in to existing collectors located at Mescalero Street, Meadow Street, and Owens Street.

The cost of the proposed work is estimated at \$2,315,715.00.

D. Standpipe Road Sewer Extension – includes the partially developed area located east and west of Standpipe Road, south of Lea Street and north of Martin Lane and Quay Street. This area relies primarily on domestic wells as a source of water. High levels of nitrate contamination have been found in some of these wells in the past. The proposed sewer work for this area includes the installation of a new interceptor (interceptor 210) along Standpipe Road, to tie-in to interceptor 113 at Lea Street, and the installation of collector lines along the different developed streets in the area.

The cost of the work is estimated at \$1,632,317.00.

7. Wastewater Treatment Plant

Several plant components are now more than 30 years old and have more than met their 20 year useful life. Other components are showing rapid signs of deterioration and need to be replaced. The city has contracted the services of an engineer to conduct a comprehensive evaluation of the treatment plant and its different components and to prepare a Preliminary Engineering Report and an Environmental Information Document. Both these documents are key requirements for the city to request federal and state funds for this project.

The cost of the required improvements is estimated at \$17,175,500.00.

DOUBLE EAGLE WATER SYSTEM

The City of Carlsbad owns and operates the Double Eagle Water System which it purchased in 1972 to enhance the city’s income from water sales and to secure a future source of water. The system is located north and east of the city and serves an area of approximately 700 sq. miles. The system currently supplies water to the oil and gas industry, WIPP, Brantley State Park, Xcel Energy generating station and the ranching community. The incorporated area of the city located along the Hobbs Highway and the Sand Point Landfill are also served by the Double Eagle system with up to 200gpm entering this portion of the Municipal Water System. The following upgrades are designed primarily to enhance the existing delivery system to allow for more Double Eagle water to be utilized within the city limits.

1. Producing Wells

There are a total of 29 wells in the Double Eagle Water System. Only 14 of the 29 wells are currently in operation. Twelve (12) of the wells in operation are located in the North Well Field and the other two (2) wells are located in the South Well Field. The North Well Field supplies water to two thirds of

the system including the city, while the South Well Field is the main source of water for WIPP and a handful of other users. Most of the wells were not engineered to handle problems such as changes in static water levels, excessive sand production, corrosion, incrustation, etc. These problems present themselves after many years of service.

There is definitely a need for more than one (1) backup well in the south field. However, before more money is spent on overhauling poorly constructed small diameter wells, consideration needs to be given to doing away with so many wells and installing fewer larger diameter wells capable of producing as much as 500 gallons per minute. These wells will be installed with the proper gravel pack and properly sized screens to maximize water production and to avoid the production of any sand.

A total of \$50,000.00 in funds received from the 2007 Legislature for the Double Eagle Water System is currently available. It is recommended that these funds be used to provide the city with a design for the larger diameter wells.

It is also recommended to install six (6) new large diameter wells, three (3) in each well field, once the design is completed.

The cost of drilling, equipping, and connecting these new wells to the system is estimated at \$250,000.00 per well. The total cost for six (6) new wells is estimated at \$1,500,000.00.

2. Transmission Waterlines

A. The north transmission waterline consist of approximately 6.5 miles of 22 inch diameter collector line in the north well field and approximately 4.5 miles of 14 inch diameter waterline connecting the North Well Field to the 3.0 million gallon water storage tank. The 6.5 mile long, 22 inch diameter collector line is in bad condition and needs to be replaced.

The cost of replacing this line with a 12 inch diameter waterline is estimated at \$4,180,725.00.

B. The south transmission line consists of approximately 8.5 miles of 12 inch waterline connecting the wells in the South Well Field to the site of the 3,000 barrel storage tank, no longer in operation. This line is not in need of any upgrades at this time.

3. Storage Tanks

There are two (2) storage tanks currently in operation in the Double Eagle Water System. The main storage tank with a 3.0 million gallon capacity is located approximately 5 miles north of Maljamar, NM, and 4.0 miles southeast of the North Well Field. This storage tank supplies water to the western service area of the system which includes Carlsbad, and to the eastern service area which includes WIPP.

The second water storage tank in the Double Eagle Water System is located approximately 4.0 miles northeast of Carlsbad. This 1.0 million gallon water tank currently supplies water to the incorporated area located along the Hobbs Highway (US 62/180) including Ridgecrest Subdivision and the Sand Point Landfill.

Both storage tanks appear to be in good structural condition, but they need to be cleaned to remove sand produced at the wells, which have deposited inside the water tanks. Once the tanks are cleaned, they can be inspected to determine the extent of any needed repairs.

The cost of clean up, inspection and possible repairs to the tanks is estimated at \$74,000.00.

A hydraulic model of the Double Eagle Water System is on its final phase of being completed. The hydraulic model will be used to identify the size and location of one or two new storage tanks with a combined capacity of as much as 5.0 million gallons. Additional storage capacity is needed to:

A. Provide storage capacity at the eastern service area where it is non-existent and to enhance the service to customers located along the WIPP Waterline to WIPP and to potential WIPP related ventures to locate near WIPP.

B. Address pressure problems during high demand at the west end of the system.

C. Provide an additional 500gpm to the city in order to supply all customers north and east of the Pecos River with Double Eagle Water.

The cost of the new reservoir(s) is estimated at \$2,728,139.00 of which a total of \$139,039.00 has been budgeted for FY 2007/08 for engineering and \$1,250,000.00 has been funded by a 2007 legislative grant (\$650,000.00) and a Water Trust Board Grant (\$600,000.00).

The amount not funded at this time and needed to complete this project is \$1,339,100.00.

4. Distribution Waterlines

There are approximately 486 miles of distribution waterlines currently in operation in the Double Eagle Water System. These waterlines range in size from 2 inches to 24 inches. Approximately 50% of these lines is made of steel pipe and the other 50% is made of Reinforced Concrete pipe, Asbestos Cement pipe, and Polyvinyl Chloride pipe. Some of the key distribution waterlines are too old and deteriorated and prone to numerous leaks and breaks, or too small to accommodate the high water demand imposed on the system. Improvements needed are described as follows:

A. 12 inch steel water line – this line located between the 3.0 million gallon reservoir and the High Lonesome Pressure Reducing and Metering Station is approximately 68,000 feet in length. The line is in very poor condition, and it is also too small to convey higher flows to the western service area. During periods of high demand this line experiences significant head pressure losses. It is recommended that this line be replaced with an 18 inch diameter waterline.

The cost of this replacement is estimated at \$10,074,459.00.

B. 6 inch to 10 inch water line – this Asbestos-Cement line located between the 3.0 million gallon storage tank and the beginning of the 24 inch diameter WIPP waterline is approximately 47,500 feet in length and too small in size to provide the flow needed from the 3.0 million gallon tank if the South Well Field is not able to supply water to the eastern service area.

The cost of this improvement is estimated at \$7,953,649.00.

5. Pressure Reducing Stations and Booster Pump Stations

There are a total of twelve (12) pressure reducing stations, one (1) pressure sustaining station, and two (2) booster pump stations in the Double Eagle Water System. No repairs or reconfigurations are anticipated at this time.

6. Water Meters

There are approximately 215 metered connections in the system. These connections range from $\frac{3}{4}$ inch to 4 inch in size. A total of 86 service connections are currently active. Meter reading in the Double Eagle Water System is hard on the vehicles and on the personnel because of the size of the system and the condition of the dirt access roads and easements. It regularly takes two working days to read all the active meters.

The city is considering replacing all meters with meters equipped with radio transmitters which will send the signal to a tower in the area. This tower will relay the signal to the Water Department office.

The cost of this improvement is estimated at \$194,604.00.

7. Supervisory Control and Data Acquisition (SCADA) System

The city has purchases most of the components to install a 22 site SCADA system for the Double Eagle Water System through a grant received from the U.S. Department of Homeland Security. The grant was used to purchase the equipment and no funds remain at this time to purchase some additional electronic components and other materials needed for the installation of the SCADA system.

A total of \$30,000.00 is needed to complete this project utilizing Public Works personnel.

8. Water System Planning

The city purchased the Double Eagle Water System to secure a future source of water. This has been demonstrated by the recently completed Geohydrological Assessment of the Double Eagle Water System and the Tatum rights. This study demonstrates that, if properly managed, the Double Eagle system will produce 70% of its water rights for the next 100 years. The city has more recently contracted the services of a consultant engineer to create a hydraulic model of the Double Eagle system to identify the size and location of one or two new storage tanks. More remains to be done in the area of planning however, to transform the Double Eagle system into a reliable source of water for the City of Carlsbad.

The preparation of a comprehensive master plan for the Double Eagle Water System is a must. The master plan shall first and foremost assess the current conditions of the system, plan for needed repairs, and consider ways to continue to supply water to the system's current customers and to the city for years to come.

The cost of the master plan is estimated at \$150,000.00.

MUNICIPAL ROADWAY SYSTEM

The Five (5) Year Street Maintenance Plan concept was approved by the Governing Body in December 2001. The plan as presented called for an annual investment of \$1.120 million for street improvement needs. The plan became a reality in 2003 with the creation of the WIPP Acceleration Fund, which dedicated \$1.0 million for street improvements. Except for Fiscal Year 2007 when funds were obligated to other needs, the city has been able to keep up with the five year plan.

The general condition of the city streets must be continuously monitored so improvements can be planned. The goal is to match funding levels so the overall condition is improving or remaining constant. Prior to the implementation of the Five Year Plan and the creation of the WIPP Acceleration Fund, the general street condition was poor and getting worse fast. Today the condition of the city streets is vastly improved but more work remains to be done.

This year, the street improvement plan has been heavily revised. Up to this point, the plan was based on street condition but streets with heavy use were not getting done when needed. A new criterion is proposed in the revised plan that is based on a combination of street condition and street usage. Now the major arterial roads in poor condition will be rebuilt before residential streets in poor condition but with very little use. Appendix A includes the recommended improvement plan. Some road segments are not included in the plan because they are either already underway or are already funded.

The total length of streets in the city's roadway system is approximately 902,888 lineal feet. Streets with a priority of 10 or above are considered to be streets in need of repair. All streets in poor, very poor, or failed condition are included in this group. Also included here are several street segments consider to be in fair condition but with a high use which makes them prime candidates for preventative maintenance and future improvements. A total of 130,889 lineal feet of streets are included in this group of streets with a priority of 10 or higher.

The estimated cost of these improvements is \$ 9,117,800.00.

Municipal Water System

1.	Water System Master Plan	\$ 220,000.00
2.	Well No. 6 Improvements	1,441,358.00
3.	High Pressure Loop Extension	3,622,282.00
4.	San Jose St./Elgin Road 12 inch diameter waterline	1,630,382.00
5.	National Parks Hwy. 12 inch diameter waterline	914,607.00
6.	North Canal Street waterline replacement	1,486,357.00
7.	SCADA System Update	102,500.00
8.	Water Meter Automation – equip. and installation	2,923,043.00
9.	North Canyon Street waterline replacement	404,815.00
10.	Juanita Street waterline replacement	79,800.00
11.	Westridge Road waterline replacement	242,968.00
12.	Steel and Cast Iron waterline replacement	963,000.00
13.	Reservoir No. 1 Booster Station upgrade	237,200.00

14.	North Loop Transmission waterline repairs	409,202.00
15.	Sheep's Draw Wells Upgrade	1,200,000.00
16.	Well No. 10 and gathering line	3,409,754.00
17.	Storage Tank clean-up and repairs	96,368.00
18.	South Eighth Street 12 inch diameter waterline	500,578.00
19.	Sub-Standard Lines replacement	4,503,500.00

Total Estimated Cost of Proposed Improvements to the
Municipal Water System \$24,387,714.00

Municipal Wastewater System

1.	Sewer Master Plan	\$ 215,000.00
2.	Wastewater Treatment Plant Improvements	17,175,500.00
3.	Interceptor 119 Upgrade	539,950.00
4.	Jefferson Street alley sewer Upgrade	161,429.00
5.	Sewer Manhole Repair	486,000.00
6.	Primary Lift Station Variable Frequency Drive replacement	258,000.00
7.	La Huerta Lift Station replacement	1,770,000.00
8.	Belva Lift Station replacement	491,550.00
9.	Pate Street Lift Station replacement	504,000.00
10.	Steven Street Lift Station replacement	481,400.00
11.	Hagerman Street Lift Station replacement	495,700.00
12.	Hall Street Lift Station replacement	486,000.00
13.	Bataan Bridge Lift Station replacement	630,750.00
14.	Sewer Collector Line Improvements	1,734,000.00
15.	Southern Region Sewer Extension:	
	Interceptor 219	1,314,000.00
	Elgin Road Lift Station	762,000.00
	Elgin Road Sewer	565,737.00
16.	National Parks Hwy. Sewer Extension – Interceptor 222	822,798.00
17.	Southwest Region Sewer Extension – Interceptors 211,212,& 213	1,579,500.00
18.	La Huerta Sewer Extension – Interceptor 201	2,711,500.00
19.	Big Sky Sewer Extension	2,315,715.00
20.	Standpipe Road Sewer Extension	1,632,317.00
21.	Happy Valley Sewer Extension	2,142,303.00

Total Estimated Cost of Proposed Improvements to
Municipal Wastewater System \$39,275,149.00

Double Eagle Water System

1.	Double Eagle Water System Master Plan	\$ 150,000.00
2.	5.0 Million Gallon Reservoir	1,339,100.00

3.	12 inch diameter Steel Waterline replacement	10,074,459.00
4.	North Transmission Waterline replacement	4,180,725.00
5.	6 inch diameter to 10 inch diameter waterline replacement	7,953,649.00
6.	Water Meter Upgrade	194,604.00
7.	Large diameter Producing Wells	1,500,000.00
8.	SCADA System	30,000.00
9.	Storage Tank clean-up and repair	74,000.00

Total Estimated Cost of Proposed Improvements to the Double Eagle Water System	\$25,496,537.00
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Roadway System

Streets with a priority of 10 or higher, see Appendix A	\$ 9,117,800.00
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Total Estimated Cost of Proposed Improvements to the Municipal Roadway System	\$ 9,117,800.00
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TOTAL ESTIMATED COST OF PROPOSED INFRASTRUCTURE IMPROVEMENTS	\$ 98,277,200.00
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