

Scope of Services

City of Goodyear

Integrated Water Resources, Water, Wastewater, and Reclaimed Water Master Plan Project

Exhibit A

Scope of work and Estimate of Effort

BACKGROUND

Goodyear is located 20 miles west of Phoenix in the area of Maricopa County known as the Southwest Valley. The City of Goodyear encompasses 191 square miles. Goodyear's Municipal Planning Area (MPA) is currently 246.6 square miles. As of July 1, 2013, MAG estimates the City's population as 72,274 with a dwelling unit count of 27,163. According to the 2010 Census, the City's census count of 65,275 placed it as the 5th largest municipality in Maricopa County and the 14th largest municipality in the State of Arizona. Goodyear's MPA population in 2010 was 68,031. Since the early 1990s, the City's population has grown tremendously. The average annual growth rate between 1950 and 1969 was 2.9%, between 1970 and 1989 it was 5.6%, and between 1990 and 2009 it jumped to 12.5%.

The City provides water, wastewater and reclaimed water for a large portion of the MPA. Water and wastewater services north of Interstate-10 are provided by a privately owned utility company. The study area for the Integrated Water Master Plan is based on Chapter 2 of the Goodyear 2025 General Plan, which is available on the City's website.

The City currently operates four Public Water Systems and treated water is supplied from the following facilities:

- Site 21, a 2.5 million gallons per day (mgd) facility completed in 2010-12 that primarily treats groundwater for Arsenic using Adsorption Media.
- Site 18, a 1.0 million gallons per day (mgd) facility that primarily treats groundwater for Arsenic using Adsorption Media.
- Site 12, a 1.0 million gallons per day (mgd) facility that primarily treats groundwater for TDS using Reverse Osmosis.
- Bullard Water Campus, a 3.5 million gallons per day (mgd) facility that primarily treats groundwater for TDS using Reverse Osmosis.
- 12 production wells, all of which are currently operational.

Wastewater Services is responsible for the collection and treatment of wastewater for customers in the City of Goodyear service area. Wastewater is transported through a system of 235 miles of sewer mains to one of the City's three wastewater reclamation facilities (WRFs), which treat a combined total of 5.5 million gallons of wastewater per day.

- Goodyear WRF (formerly 157th Ave WRF) is a 4.0 mgd activated sludge process with secondary clarification and tertiary filtration.
- Corgett WRF, is a 0.8 mgd activated sludge process with secondary clarification and, tertiary disc filtration.

- Rainbow Valley WRF, The plant is a 0.75 mgd activated sludge process with a clarifier, tertiary sand filters and contact basin, and aeration basin.

At all three WRFs, the wastewater is treated to a level that can be safely recharged (allowed to percolate down into the water table), providing the potential to improve the groundwater quality. The treated effluent can also be used for industrial and turf-related uses. Along with groundwater recharge, the City also recharges surface water at the Agua Fria and the Tonopah, Hieroglyphic, and Superstitions Recharge Projects operated by the CAP.

PROJECT ASSUMPTIONS

In order to complete this update, the following assumptions are made by the Consultant(Carollo):

- 1) Goodyear may not be able to provide complete water and wastewater models to be used as starting points for this update. A citywide water reclaimed model does not exist and is not expected to be needed for this project. Goodyear will make available current Geographic Information System (GIS) data describing the existing infrastructure and the infrastructure described in the current Master Plans. Carollo reviewed the City's water and wastewater GIS data. The water GIS data has some topology issues that would need to be addressed to create the water model. The sewer GIS data appears to have nearly complete manhole invert and rim data and good topology. Therefore, GIS data can be used effectively to create the collection system model. City staff will make available the population and employment projections from the 2013 MAG Socioeconomic Projections and the Infrastructure Improvements Plan (IIP). All models will be updated or created and provided to the city after completion of the project.
- 2) Goodyear's current customer billing record database will be made available and used to the extent practicable for the land use demand analysis. This database is not currently geocoded to the parcel or meter location.
- 3) Goodyear's proposed General Plan 2025 will be used to guide this update.
- 4) City staff will provide current MAG and City population estimates which are based on the 2010 Census. These estimates will be used for the population and employment growth projections.
- 5) Goodyear will provide copies of any reports or documents related to their water supply or water systems, including but not limited to the 2010 Designation of Assured Water Supply, and the recently completed groundwater flow model.
- 6) Goodyear will make available future development plans.
- 7) Carollo will be responsible for flow monitoring of the wastewater system and in-system pressure readings of the water system for model verification.
- 8) City will provide Land Use Assumptions, Infrastructure Improvements Plan and Development Fees from the TischlerBise 2014 Plan.
- 9) The City will provide the latest information that is in the current MAG 208 Plan or the draft plan that is currently being updated.

TASK 1.0- WATER RESOURCES MASTER PLAN UPDATE

1.1 Objective

Carollo shall update Goodyear's current water resources master plan to create a comprehensive plan that allows the City to manage all of its water resources in a legal and sustainable manner. The plan shall identify current demands of the Base Year (2015) and strategies to meet the increasing demands for all water sources for short-term (2020), mid-term (2025) (in order to conform to the renewal date of the current ADWR Designation), and build-out planning horizons. Carollo shall align the plan with the City's goal of maintaining its Designation of Assured Water Supply beyond 2025.

1.2 Projected Water Supply Availability with Existing and Acquired Resources

Carollo will be provided with a current list of existing and potential water sources that if acquired, will become part of Goodyear's portfolio of available water resources within the short-term planning horizon. Sources of water are currently envisioned to include Colorado River water (CAP), groundwater (local and imported groundwater supplies), recovered water, exchange water with Gila River Indian Community, and reclaimed water. Each source will be evaluated separately for physical, legal, and continuous availability over the next 100 years and the degree of reliability which can be reasonably expected for each planning horizon (for example, Non-Indian Agricultural allotments of CAP water will have a reliability factor of only 70% in any given year, diminishing over time).

Each source will be evaluated for availability in the event of a 30% and a 50% shortage of Colorado River water (CAP) and firming opportunities. Each source will additionally be evaluated as to where it can be utilized. Each source will finally be evaluated for compatibility with current sources. Carollo will evaluate any surface water recommendation for water aging and recommend a blending option(s) to match existing water quality parameters so as to not dramatically change the current system. Water supply availability will be tabulated for a 100 year planning horizon to meet Assured Water Supply requirements, as well as build-out. The City has completed its groundwater flow model for its designation of assured water supply permit and will provided this information to Carollo. Carollo may review current models and planning scenarios.

1.3 Prepare New Demand Projections

1.3.1 Growth and Population Projection

Carollo will work with city staff to develop growth and population projections for the planning horizons and build-out conditions using the Land Use assumptions and population projections included in the TischerBise 2014 Development Impact Fee reports as a basis.

1.3.2 Review/Update Water System Demand Projections

Carollo will calculate average annual and peak day demands and determine appropriate per capita water demand factors. Customer billing records, together with production records, will be used to estimate demand factors for land use categories which will be used in estimating future demands. Historical water use will be correlated by areas within Goodyear to develop an estimate of future demands that considers the specific type of development that is anticipated for undeveloped lands within Goodyear. This update will

take into account redevelopment impacts as well as any proposed changes in land use types.

1.3.3 Wastewater Flow Measurements

Carollo will develop a wastewater collection system monitoring plan to identify locations to collect flow measurements in specific service areas and land use types. This flow data will be used in conjunction with lift station records, WRF flow records, and operations data to develop the existing system flow generation values. Using the updated population estimates, GIS and land use plans, Carollo will develop updated unit flow projections for each land use category and per capita flow projections. The updated flow projections will be used for modeling analyses and master planning. The impact that inflow and infiltration following storm events has on wastewater flows will be considered in the wastewater flow estimates.

1.3.4 Quantify Reclaimed Water Availability

Using the wastewater flow generation information developed in Task 1.3.3, Carollo will determine the quantity and timing of reclaimed water supply that could potentially be available for either direct reclaim or recharge. The reclaimed water availability will take into account wastewater treatment and system losses in order to predict a quantity of reclaimed water available for reclaim/recharge. Seasonal, monthly, and diurnal supply availability curves will be developed. Projections of supply will be made for each planning horizon. Projections of water resource short falls will be evaluated.

1.4 Demand Projection Workshop

The results and conclusions of the demand projection efforts will be presented by Carollo at a workshop with Goodyear Staff.

1.5 Prepare Updated Water Resources Plan Strategy - Supply vs. Demand

1.5.1 Summarize Demands and Compare Against Supplies

Carollo shall summarize Goodyear's water demands and compare them against available supplies to meet demands for each planning horizon and for each surface water shortage contingency. Based on the results of this analysis, opportunities to mitigate shortfalls, and modify and update the water resources plan strategy including acquisition of additional water supplies (if necessary) will be identified. The Rainbow Valley Sub-basin (Southern Solution) shall be evaluated in tandem, with available supplies and required imported water supplies. If additional new water supplies are required, consultant will identify potential new water sources to acquire. The results of the updated water resources plan strategy will use a mass balance water resources approach to analyze on-site water supplies and required imported water supplies. Drought mitigation measures to develop a Curtailment Plan for the City, and water supply availability and demand projections will be prepared separately from potable water supply and demand calculations, but will be evaluated as part of the city's overall water portfolio.

1.5.2 Develop a Model to Evaluate Demands

Carollo will develop a spreadsheet based model to evaluate the spatial distribution and relationships of land use growth projections from GIS data, and water demand. The model shall be capable of evaluating and projecting annual supplies, water resources, effluent management, recharge, and demands based on land use and growth projections.

1.6 Develop Sound Water Management Policies

Carollo shall provide a compendium of sound water policies that cover topics ranging from regulatory compliance to water conservation to land use water management to drought planning. Consultant will focus on principles outlining an economic value of water calculation that provides a framework to assist in land and water use decisions. Carollo will assist City staff in developing a schedule of constants that can be applied to each of the factors in the economic value of water calculation. They shall also review how the calculation can be modified to include the net value of water, which takes into account the percentage of water that a user returns to the wastewater system that the City can then reclaim.

1.7 Water Conservation Program Evaluation

Carollo shall evaluate trends in demand management by reviewing the City's water conservation program and current measures of water efficiency and evaluate against the City's current performance measures. The trends and current measures will be reviewed and discussed with staff and will be evaluated resulting in a recommendation to improve the program such that water demand is reduced over time. Recommendations may be phased to correspond to planning horizons.

1.8 Water Resources Workshop

The results and conclusions of the water resources update will be presented by Carollo at a workshop with Goodyear Staff.

1.9 Water Demand and Resources Technical Memorandum

Carollo will prepare a Technical Memorandum documenting the Water Resources component of the Master Plan Update. The memorandum will include supply availability and resources, supply vs. demand projections, recharge/reclaim water banking strategies, and conservation information. The sound water management policy recommendations shall also be included. The results and conclusions of Task 1.0, Water Resources Master Plan Update, will be presented at a workshop with Goodyear staff. Deliverables will be provided in accordance with Task 5.0.

1.10 Support of Future Water Resources Dashboard

The City will be developing a dashboard to support decision making that will assist the City in deploying and managing water resources in a sustainable manner. Development of the dashboard is not part of the scope of services of this contract project, however all information, assumptions and recommended strategies from the completed integrated water master plan will be a required deliverable as part of this project.

The decision tool will provide graphical output in a dashboard format that summarizes information from planning, engineering, water resources and City management. The tool will provide output on supplies and demands, tracking of sustainable water resources supplies and long term storage credit accrual/use, and capital and operations and maintenance costs for major

facilities. The decision support tool will originally mirror the base information (data) presented in the integrated water master plan and its components. The tool will have the capability of dynamic analysis and ability to compare alternate water use scenarios such as acquisition of new water resources, changes in assumed development trends and maximizing direct reclaimed versus recharge or reclaimed water.

1.10.1 Water Resources Dashboard Technical Memorandum

Carollo will prepare a technical memorandum describing the technical and functional requirements of the dashboard along with necessary input data and system information from the work completed in this project to enable the full performance and operation of the dashboard. The technical memorandum shall also describe the location of all the required information for future implementation of the dashboard.

TASK 2.0- WATER SYSTEM MASTER PLAN UPDATE

2.1 Objective

Carollo shall update Goodyear's current water system master plan to create a comprehensive plan that allows the city to manage all its water supply, water treatment and distribution systems in an effective and efficient manner. The plan shall identify strategies to meet the increasing demands for water supplies and distribution for short-term 2020, mid-term, and build-out planning horizons. The Rainbow Valley Sub-basin (Southern Solution) shall be evaluated in tandem, with available supplies and required imported water supplies regarding initial satellite water service areas, water transmission and distribution systems, and checkerboard growth. Evaluation should include required booster and storage recommendations.

2.2 Data Collection

Carollo will coordinate with Goodyear staff to obtain or collect necessary information and data related to the existing water distribution system. Data collection includes, but is not limited to: the physical system components such as wells, reservoirs, boosters' distribution lines, treatment plants and operational performance data. Any additional future planning data not currently part of the dataset will need to be collected and evaluated. These data will serve as the basis for performance evaluation and infrastructure planning.

2.3 Review/Update Water System Performance Criteria

Carollo will obtain and review existing water system performance, water quality, and operational criteria, including water storage requirements and peaking factors, and will meet with Goodyear staff to review proposed criteria and arrive at a consensus on system performance criteria. These criteria will serve as the basis for performance evaluation and infrastructure planning.

2.4 Existing Water System Evaluation

2.4.1 Review/Update Pressure Zone Boundaries

Carollo will obtain current pressure zone boundaries from Goodyear staff. Boundaries will be reviewed and discussed with staff relative to current operations and future infrastructure planning, and will be evaluated resulting in a recommendation for the preferred boundary modifications.

2.4.2 Model Creation and Verification

Carollo will create a water system model from the City's GIS data, pump, well and storage facilities data, and water demand information. Carollo will prepare a protocol for collection of model verification data that will be based on-in-system pressure readings. A field test will be conducted, and the water model will be validated using this information.

2.4.3 Update Water System Model to Reflect Planning Horizons

Carollo will create a new planning model to reflect the future conditions, including intermediate planning horizons as well as build-out conditions to identify future infrastructure needs. In most cases, future pipes will have a diameter of 12-inches and above.

2.4.4 Document Water Quality Requirements

Carollo will provide an overview of the current federal and state regulations and guidelines as they impact Goodyear's water system operation. This overview will include disinfection byproducts, disinfection residuals, and future parameters that may impact system planning and operations.

2.4.5 Water Production and Treatment Evaluation

Carollo review current brine disposal processes and the results of the pilot study, currently underway, to update brine management recommendations in the 2007 IWMP. Also Carollo will evaluate and make recommendations for the future water system development of brine management for the planning horizons and include in Task 2.5.1.

2.4.6 Existing System Infrastructure Evaluation

Carollo will evaluate Goodyear's existing water system, identify deficiencies, and make recommendations for improvements. The existing water system evaluation will include a performance assessment under average day, maximum day, and peak hour demand conditions. System performance will also be assessed under fire flow and emergency conditions such as line breaks. Carollo will document the performance of the existing booster pump stations based on the results of the modeling scenarios, and recommend required upgrades or modifications.

2.4.7 Document Infrastructure Repair and Replace Requirements

As Goodyear's water infrastructure ages, increasing importance will be placed on rehabilitation of the system components to maintain reliability. Carollo will provide an overview of the current best practices related to the repair and replacement of water systems components, review the current maintenance management system in use, and recommend a strategy to apply these practices and current applications to develop a comprehensive asset management program.

2.5 **Water System - Future System Needs**

2.5.1 Identify and Evaluate Future Water System Improvements and Expansion Strategies

Carollo will evaluate and make recommendations for the water system development which would support or amend the current CIP for short-term, mid-term (2025).

Short-term evaluations will include:

- Incorporating improvements for existing system deficiencies as outlined in Task 2.4.6 and 2.4.7
- Short-term infrastructure improvements needed to supply pending developments, including pipe sizing, new well/storage facility/pump stations, etc.
- Complete a draft report on the adequacy of the current 5 year CIP to meet system demands including the Southern System strategy by December 15, 2014.

All plans will be developed for the water system using the water model for infrastructure sizing to include the following:

- Production facilities
- Transmission/distribution piping
- Storage reservoirs
- Pumping facilities
- Pressure Zone interactions/PRVs

2.5.2 Supply and System Reliability Assessment

Carollo will prepare a reliability assessment for the long-term water system development strategy. The reliability assessment will consider:

- Multiple production sources
- Major facility outage
- Transmission/distribution looping
- Pressure Zone interactions
- Storage for diurnal, fire flow, and emergency events

2.5.3 Well Site Improvement Strategies

As growth continues to occur, the City's well facilities will need to be utilized to meet the future demands. The City has retained Brown & Caldwell to perform a comprehensive groundwater modeling update to the Arizona Department of Water Resources' (ADWR) Salt River Valley groundwater model that was used for the Phoenix Valley re-designation of the cities and towns Designations of Assured Water Supply. The City's model was used to evaluate:

- Recharge opportunities within the Northern MPAs.
- Expanding the legal withdrawal authorities for the City of Goodyear's Well 22 and Well 18B.
- Configuring the City's designation of assured water supply renewal. The City's groundwater flow model went beyond ADWR's model in that it quantified the amount of groundwater supplies within the Rainbow Valley Sub-Basin.

The principle goals of the City's groundwater flow modeling provided the required analysis for the physical, continuous, and legal availability of groundwater resources that are available to the City for 100 years. The City's groundwater flow model was also used to evaluate the current and future quantities of long term storage credits that would be generated from reclamation facilities and stored within the aquifer and the amount of current and future annual groundwater pumping. The model also critically evaluated the physical availability and limitation of groundwater within the Adaman water service area (near the Luke AFB sink) as part of the City's partnership with the water provider.

Carollo will evaluate how to best utilize the city's existing water infrastructure to meet the future potable water needs as well as identify future contaminants of concern (e.g. arsenic, TDS, etc.) as they may affect groundwater use and treatment.

2.6 Water System Planning Workshop

The results and conclusions of Task 2.0, Water System Master Plan Update, will be presented by Carollo at a workshop with Goodyear Staff.

2.7 Prepare Water System Technical Memorandum

Carollo will prepare a Technical Memorandum documenting the Water System component of the Master Plan Update. The memorandum will include planning criteria, existing system evaluation, water demand projections, modeling results, future infrastructure requirements, a summary of future costs, and a prioritized implementation schedule with the fiscal year each project is estimated to be needed identified Upon resolution of comments from the workshop the Technical Memorandum will be provided to the City for review.

TASK 3.0- WASTEWATER SYSTEM MASTER PLAN UPDATE

3.1 Objective

Carollo shall update Goodyear's current wastewater system master plan to create a comprehensive plan that allows the City to manage the wastewater generated within the city in a safe and efficient manner. The plan shall identify strategies to meet the increasing wastewater flows generated for short-term (2020), mid-term (2025), and build-out planning horizons. The Rainbow Valley Sub-basin (Southern Solution) shall be evaluated in tandem, with available and future water reclamation plants, sewer collection areas, sewer transmission systems, and checkerboard growth.

3.2 Data Collection

Carollo will coordinate with Goodyear staff to obtain or collect necessary information and data related to the existing wastewater collection system. Data collection includes, but is not limited to, the physical system components such as gravity sewer lines, gravity sewer interconnection structures, lift stations, force mains, treatment plants and operational performance data.

3.3 Review/Update Wastewater System Performance Criteria

Carollo will obtain and review existing wastewater system performance, and operational criteria, including peaking factors, and will meet with Goodyear staff to review proposed criteria and arrive at a consensus on system performance criteria. Any additional future planning data not currently part of the dataset will need to be collected and evaluated. These data will serve as the basis for performance evaluation and infrastructure planning.

3.4 Existing Wastewater System Evaluation

3.4.1 Review/Update Water Reclamation Facility Service Area Boundaries

Carollo will obtain current wastewater collection boundaries from Goodyear staff. Boundaries will be reviewed and discussed with staff relative to current operations and future infrastructure planning, and will be evaluated resulting in a recommendation for the preferred boundary modifications.

3.4.2 Create the Collection System Hydraulic Model

Carollo will create a wastewater collection system model from the City's GIS data, operational information at lift stations, wastewater loading information, and wastewater flow data. Carollo will also prepare a protocol for the collection of model verification data that will be based on in-system wastewater flow monitoring (see Task 1.3.3) and calibrate the wastewater model using the flow monitoring data.

3.4.3 Expand the Wastewater System Model to Reflect Planning Horizons

Carollo will create additional planning scenarios in the wastewater model to reflect the future conditions, including intermediate planning horizons as well as build-out conditions to identify future infrastructure needs. A skeletonized model may be considered for future infrastructure.

3.4.4 Document Wastewater Quality Requirements

Carollo will provide an overview of the current federal and state regulations and guidelines as they impact Goodyear's wastewater system operation including treatment. This overview will include current and future parameters that may impact system planning and operations. Water quality should be consistent with the City's current vadose zone injection wells.

3.4.5 Existing Wastewater System Evaluation

Carollo will evaluate the existing wastewater collection system to identify deficiencies and make recommendations for improvements. The existing system evaluation will include but not be limited to evaluation of each lift station regarding current and ultimate flows and pumping capacity requirements. Evaluate the need for additional relief sewers. Evaluate the capacity of lift station wet wells and pumps to determine if increased capacity is needed at any of the stations by build-out. Evaluate the need for future lift stations. Determine if changes to the basin areas of each lift station are warranted. Carollo will provide improvement descriptions to include location, scope and need for each project, and will prioritize the improvements with estimated date each needs to be in service.

3.4.6 Document Infrastructure Repair and Replace Requirements

As Goodyear's wastewater infrastructure ages, increasing importance will be to be placed on rehabilitation of the system components to maintain reliability. Carollo will provide an overview of the current best practices related to the repair and replacement of wastewater systems components, and review the current maintenance management system in use and recommend strategies to apply these practices and current applications to develop a comprehensive asset management program.

3.5 Wastewater System - Future System Needs

3.5.1 Create Build-Out Modeling Scenarios

Carollo will create modeling scenarios for the short-term (2020), mid-term (2025), and build-out planning horizons, utilizing GIS land use information, flow projections allocated to nodes, and proposed infrastructure to meet future conditions. Analysis to include facilities identified in MAG 208 Plan.

3.5.2 Evaluate and Identify Future Wastewater System Infrastructure Needs

Carollo will evaluate and make recommendations for the wastewater system development that would support or amend the current CIP for short-term, mid-term (2025). Improvements for the service areas will be evaluated and prioritized. Locations and alignments of future major interceptor sewers and lift stations will be evaluated.

Short-term evaluations will include:

- Evaluate the opportunities and develop a recommendation for Goodyear's involvement in the Tolleson proposed regional Waste Water facility.
- Evaluate the potential of Goodyear becoming a regional facility and developing an exchange program of reclaimed water with the Gila River Indian Community (GRIC).
- Complete a draft report on the adequacy of the current 5 year CIP to meet systems demands along with the Southern Solutions by December 15, 2014.

The Rainbow Valley Sub-basin (Southern Solution) shall be evaluated in tandem, with available and future water reclamation plants, sewer collection areas, sewer transmission systems, and checkerboard growth.

All plans will be developed for the sewer system using the sewer model for infrastructure sizing to include the following:

- Treatment facilities
- Collection System sizing/ piping
- Lift stations

3.5.3 Evaluate Treatment Capacity Needs

Carollo will model wastewater flows generated in each wastewater series area and analyze to verify the magnitude and timing of capacity required for each treatment facility. The priority of expansion needs will be driven by the timing of development expansions and projected flow increases, and not necessarily by specific planning horizons. Carollo will develop a proposed project list to include location, limits, scope and need for each project, and will prioritize the improvements with estimated date each needs to be placed into service identified.

3.6 Wastewater System Workshop.

The results and conclusions of Task 3.0, Wastewater System Master Plan Update, will be presented by Carollo at a workshop with Goodyear Staff.

3.7 Wastewater System Technical Memorandum

Carollo will prepare a Technical Memorandum documenting the Wastewater System component of the Master Plan Update. The memorandum will include planning criteria, existing system evaluation, modeling results, future infrastructure requirements, a summary of future costs, and a prioritized implementation schedule with the fiscal year each project is estimated to be needed identified. Upon resolution of comments from the workshop, the Technical Memorandum will be provided for City review.

TASK 4.0- WATER RECLAIMED SYSTEM MASTER PLAN UPDATE

4.1 Objective

Carollo shall update Goodyear's current reclaimed water system master plan to create a comprehensive plan that allows the City to manage all its reclaimed water supply and distribution systems in an effective and efficient manner. Carollo shall incorporate major concepts from the recent study on optimizing recharge of reclaimed water from the City's reclamation facilities. Carollo shall use the goals of the City to recharge major amounts of reclaimed water and develop guidelines designating future areas or type of uses where direct deliveries are recommended and support the objectives of the Water Resources Reclaimed Plan strategy, which includes Estrella Mountain Ranch reclaimed system. The Rainbow Valley Sub-basin (Southern Solution) shall be evaluated in tandem, with available and future water reclamation plants, recharge and recovery strategies, suitable type and recharge sites, reclaimed transmission systems, and checkerboard growth.

The updated plan shall identify strategies to meet the increasing demands for water supplies and distribution for short-term (2020), mid-term (2025), and build-out planning horizons.

4.2 Data Collection

The City will provide information on current Underground Storage Facilities and recharge operations, as well as current customer information for reclaimed water accounts. Carollo will collect available information related to the existing reclaimed water system. Data collection includes, but is not limited to, the physical system components such as pipelines, reservoirs, recharge facilities, injection wells, recovery wells, pumping facilities and capacities, historic production, and delivery data. The City has a study underway to identify preferred areas for future recharge wells. Results of the study will be available shortly and will be provided to the selected consultant. Any additional future planning data not currently part of the dataset will need to be collected and evaluated. These data will serve as the basis for performance evaluation and infrastructure planning.

4.3 Evaluate Recharge and Recovery Strategy

4.3.1 Quantify Reclaimed Water Demand over Time by Area

This task is a refinement of Task 1.3.4. Potential reclaimed water customers will be identified from the land use plan and other Goodyear user data, and their typical seasonal demand will be determined. Delivery strategies to users having onsite storage will differ from those who are connected directly to the reclaimed water system. In addition, the current demand for a given area will change as development occurs. Changes in reclaimed water demand, by area over time, will be quantified under this task. Carollo will also evaluate the consequences of revising current Goodyear policy to reduce the use

of reclaimed water for irrigation and develop reclaimed water strategies including recharge that may need to be implemented for future drought conditions. Carollo will determine a recommended peak flow and volume limit for reclaimed water customers, in relation to the wastewater flow produced by the development.

4.3.2 Develop Seasonal and Diurnal Storage Strategies

Using the reclaimed water generation information derived under Task 3.2, Carollo will develop a system-wide seasonal production/demand curve for a typical year. This curve will present in graphical format the times in the year when reclaimed water production is greater or less than demand, and will quantify when reclaimed water must be recharged as well as identifying when demand exceeds supply.

Using the information obtained under Task 1.3.4, Carollo will develop a diurnal curve for a typical day under current and build-out planning horizons. Further, diurnal demand curves will be developed for the minimum, maximum, and average day of the minimum, maximum, and average months. This analysis will quantify operational storage needs as well as the need for supplemental irrigation water.

4.3.3 Evaluate Reclaimed Water System Capacity

The Consultant will create a reclaimed water spreadsheet model to reflect the current infrastructure system. The model will be verified by developing a plan that identifies the locations of pressure, flow, and water level information. The data collected will be used to complete a mass balance of the reclaimed system, as well as a hydraulic grade line evaluation within the distribution system. Model parameters will then be adjusted so the model predicts network events as described by the field data.

4.3.4 Document Water Quality Requirements

Carollo will provide an overview of the current federal and state regulations and guidelines as they impact Goodyear's reclaimed water system operation. This overview will include future parameters that may impact system planning and operations including recharge and recovery.

4.3.5 Evaluate Adequacy of Existing Delivery System

Based on the information developed under the previous task, Carollo will evaluate the existing reclaimed delivery system. As a starting point, the proposed system to be evaluated will be that presented in the previous Master Plan, modified by input from Goodyear staff. Carollo will consider the benefit of increased looping in the reclaimed water system, evaluation of possible requirements for customer storage, and will develop performance criteria for evaluating the system. Carollo will evaluate the system against the criteria, identify existing system deficiencies, and make recommendations for improvements, including any required system upgrades or modifications.

4.3.6 Document Infrastructure Repair and Replace Requirements

As Goodyear's reclaimed water infrastructure ages, increasing importance will be to be placed on rehabilitation of the system components to maintain reliability. Carollo will provide an overview of the current best practices related to the repair and replacement of reclaimed water systems components review the current maintenance management

system in use and recommend a strategy to apply these practices and current applications to develop a comprehensive asset management program.

4.4 Evaluate the City's Reclaimed System

4.4.1 Develop Recharge and Recovery Strategies

Carollo will evaluate recharge and recovery needs and develop recommendations to achieve an acceptable level of drought protection by underground water storage, as well as a water balance approach. The quantity and timing of recharge and recovery will be determined. An assessment will be made as to the capacity of existing recharge facilities, and if appropriate, recommendations will be made aimed at increasing recharge capacity where needed. Recharge needs shall be projected for each planning horizon, taking into account the increase in reclaimed water production with growth but also accounting for reduced demand due to better water conservation techniques. Goodyear's existing and near term planned recharge and recovery facilities will be evaluated in light of the total system needs. A determination of the need for additional facilities will be made to provide the level of recharge redundancy and reliability desired by Goodyear.

4.5 Reclaimed Water System - Future System Needs

4.5.1 Update/Develop Reclaimed System Demand Projections

Carollo will update the reclaimed water system demands based on future land use and potential reclaimed customers for the short-term, mid-term and build-out planning horizons. Carollo will determine if there is sufficient operational storage on the system, and identify whether recovery wells are needed and where they should be located.

4.5.2 Review/Update Pressure Zone Boundaries

Due to the large service area and variable topography, pressure zones need to be established. Carollo will develop criteria for effective service performance to users to determine the need and delineation of pressure zones.

4.5.3 Update Future Reclaimed Water Scenarios

Carollo will update the reclaimed water spreadsheet model to reflect service to future customers through build-out. The model will be used to size infrastructure to adequately serve the existing and proposed new reclaimed customers as well as delivery to storage facilities. New infrastructure will include distribution, storage, and pumping facilities.

4.5.4 Recommended System Improvements

Based on the previous tasks, Carollo will recommend system improvements to meet the reclaimed water system demands for each planning horizon through build-out. Carollo will complete a draft report on the adequacy of the current 5 year CIP to meet system demands by December 15, 2014. Carollo will determine if there is sufficient operational storage on the system, and identify whether recovery wells are needed and where they should be located.

Provide a general and concise overview of the planning and design parameters to follow with regards to:

- Key regulations for reclaimed water recharge and directly reused.
- Water quality requirements/goals that maximize effective vadose zone injection well systems

Summarize the above for discussion with City. Revise the reclaimed system based upon the recommendations from Section 4.4.1.

4.6 Reclaimed Water System Planning Workshop

The results and conclusions of Task 4.0, Reclaimed Water System Master Plan Update, will be presented by Carollo at a workshop with Goodyear Staff.

4.7 Reclaimed Water System Technical Memorandum

Carollo will prepare a Technical Memorandum documenting the Reclaimed Water System component of the Master Plan Update. The memorandum will include planning criteria, existing system evaluation, storage evaluation, recharge and recovery, modeling results, infrastructure requirements, a summary of future costs, and a prioritized implementation schedule with the fiscal year each project is estimated to be needed identified. The results and conclusions of Task 4.0. Upon resolution of comments from the workshop the Technical Memorandum will be provided for City review.

TASK 5.0- PROJECT ADMINISTRATION AND DELIVERABLES

5.1 Project Meetings and Workshops

5.1.1 Project Meetings

At a minimum, Carollo will prepare for and attend a Project Kickoff meeting and monthly Project Status meetings for the purpose of reporting study results and obtaining input from City staff. Carollo will prepare all meeting agendas to be distributed to attendees no less than 48 hours in advance of the meeting, and all meeting minutes to be distributed to attendees within 72 hours of the meeting being held.

5.1.2 Review of the Comprehensive 5 year CIP Draft Report and Southern Solutions Draft Plan

Carollo will prepare a draft report before December 15, 2014. This report will contain an evaluation of the adequacy of the current 5 year CIP to support the demands of the water, wastewater and reclaimed systems along with a presentation of the Southern Solutions draft plan.

5.1.3 Water Planning Committee Meetings

Carollo will attend up to six meetings of the City's Water Planning Committee to present updates of the Integrated Water Master Plan study. The Committee will be appointed by Council to provide recommendations on a possible future utility rate increase. It is expected up to six presentations beginning in October 2014, will be required by Carollo.

5.1.4 Council Presentation

Carollo will assist in preparing and giving a council work session presentation near the end of the project to outline the results and recommendations of the Integrated Utility Master Plan and gather inputs. Also, assist in preparation of a presentation to the City Council at a Regular Meeting to adopt the final Integrated Master Plan. Carollo's Project Manager will attend all Council Meetings to answer technical questions. A total of three council presentations are anticipated as part of this project.

5.1.5 Modeling Software Training

Carollo will prepare for and provide up to 24 hours of modeling software training on the water and wastewater modeling software.

5.2 **Technical Memoranda**

Technical memoranda will be prepared to document study results and solicit review comments from Goodyear staff. Technical memoranda will be prepared and ten (10) copies of each will be submitted for the following tasks:

- Task 1.9 Water Demands and Water Resources Technical Memorandum
- Task 2.7 Water System Technical Memorandum
- Task 3.7 Wastewater Technical Memorandum
- Task 4.7 Reclaimed Water System Technical Memorandum
- Task 5.1.2 Five Year CIP and Southern Solutions Draft Plan

A draft of each Technical Memorandum shall be distributed to City staff to obtain comments. Carollo shall incorporate or reconcile the comments and each technical memorandum will become part of the draft report, providing a second opportunity for review.

5.3 **Project Master Plan Report**

5.3.1 Executive Summary

Carollo will prepare a color "brochure" style Executive Summary which will be a standalone summary of the completed Master Plan suitable for distribution to the City Council, City Leadership, stakeholders and the general public. The Executive Summary brochure will contain color graphics, charts, and pictures explaining the Integrated Water Resources Master Plan. Carollo will prepare and deliver 30 copies of the Executive Summary together with an electronic copy for City staff to use in producing additional copies.

5.3.2 Integrated Master Plan Report

Carollo will prepare and deliver 15 copies of the Integrated Utility Master Plan in tabbed, 3-ring binders and the electric PDF copy of the entire report. The footer of each page of the document shall contain Carollo's file name, the date the page was created, and the page number. All tables, graphs, and figures shall clearly indicate the month and year in which they were created, and the source of the information provided therein. It is envisioned that the Master Plan will be in one binder, with a separate binder(s) to hold appendices.

5.3.3 Digital Document Management

Carollo shall provide copies of all written deliverables for this study (printed materials, graphs, tables, figures and appendix materials) in an indexed and searchable Portable Document (PDF) file format.

Carollo shall provide electronic copies of the files in the final Master Plan in MS Word and Excel file formats

Carollo shall provide all final maps produced for the Master Plan to the City in a GIS file format that is compatible with the City's systems (currently ArcMap 10.1).

5.4 **Project Schedule**

The project schedule is attached.