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UTILITIES DIVISION

September 22, 2016

Mr. Jason Mickel, Water Supply Section Manager
Southwest Florida Water Management District – Water Resources Bureau
2379 Broad Street
Brooksville, Florida 34604

RE: Cooperative Funding Agreement No. 15C00000102
Polk County Regional Water Supply Entity (N447)
Final Water Supply Assessment

Dear Mr. Mickel:

On behalf of Polk County and participating municipal stakeholders, we are pleased to submit the attached Final Water Supply Assessment to the Southwest Florida Water Management District (District) pursuant to Cooperative Funding Agreement No. 15C00000102 for the Polk County Regional Water Supply Entity (N447).

Also attached are minor clarifications to our June 14, 2016 response to the District's comments on the Draft Water Supply Assessment.

We appreciate the assistance provided by the District in achieving this important milestone in the formation of the Polk County Regional Water Supply Entity. Should you have any questions or require additional information, Please contact me at (863)-298-4100.

Sincerely,
POLK COUNTY UTILITIES

Mark Addison, P.E.
Utilities Community Investment Program Manager

cc: Mark Hammond, P.E. SWFWMD Resources Management Division Director
George Schlutermann, N447 Project Manager for SWFWMD
Krystal Azzarella, N447 Project Manager for Polk County
Joshua Behr, P.E., Capital Projects Manager
Devan Henderson, P.E. N447 Project Manager for Consulting Team, Hydro Solutions Consulting, LLC.
Polk Regional Water Cooperative Technical Team Primaries
PCU Project File (N447): 2009-6-70-0

Revised Responses to Draft Water Supply Assessment Comment Response dated 6/14/2016

Page 16:

Comments 3-4) Since the SWFWMD needs to evaluate each project for cooperative funding consideration it is probably not best to show the column of "Capital Cost After Cost Share". Also production cost column should be revised to show the raw numbers without cost share.

Responses 3-4) *~~It will be much more difficult for these projects to move forward without cost share funding, as such, we suggest including this information. We suggest providing two columns for Production Cost, one with and one without potential cost share funding. A clarification note will be made, but the WSA team wishes to make the changed recommended above in lieu of this requested change to the final document.~~*

Revised Response 3-4) *Upon further review, the production costs were not calculated by the WSA team, they were taken from Regional Water Supply Plans. The source of this data is provided on page 16 and the footnote. It is proposed that no change to the cost table be made.*

Page 17:

Comment 4) See SE Polk reports for implementation time.

Response 4) *~~Implementation time will be verified and supporting information provided regarding SE Polk wellfield.~~*

Revised Response 4) *The PCCWSP estimated 10 years from start to finish and the CFWI RWSP estimated 8 years starting from finalization of permitting to project completion. Since permitting and other activities have been completed, the implementation time is shorter than 8 years. It was noted that these are estimates and will be further vetted in the next stages of the project. It is proposed that no changes be made.*

PHASE 1 WATER SUPPLY ASSESSMENT

September 14, 2016

Prepared For:

Polk Regional
Water Cooperative

Prepared By:

Hydro Solutions Consulting LLC | WSP | Parsons Brinckerhoff | AquaSciTech Consulting, PLLC

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1. **2006 SOUTHERN WATER USE CAUTION AREA RECOVERY STRATEGY**
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3. **2010 WINTER HAVEN SUSTAINABLE RESOURCE MANAGEMENT PLAN**
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ACRONYMS/ABBREVIATIONS

Acronyms/Abbreviations	Definition
AADF	Annual Average Daily Flow
AWS	Alternative Water Supply
BEBR	Bureau of Economic and Business Research
CFWI	Central Florida Water Initiative
CRUSA	Central Regional Utility Service Area
DEP	Department of Environmental Protection
ERUSA	Eastern Regional Utility Service Area
FDACS	Florida Department of Agricultural and Consumer Services
Kgal	Thousand gallons
LFA	Lower Floridan aquifer
LUT	Land Use Transition
MCDA	Multi-Criterion Decision Analysis
MFL	Minimum Flow and Level
MGD	Million Gallons per Day
NERUSA	Northeast Regional Utility Service Area
NERWWTF	Northeast Regional Wastewater Treatment Facility
NWRUSA	Northwest Regional Utility Service Area
PCCWSP	Polk County Comprehensive Water Supply Plan
RWSP	Regional Water Supply Plans
PRWC	Polk Regional Water Cooperative
RO	Reverse Osmosis
SERUSA	Southeast Regional Utility Service Area
SFWMD	South Florida Water Management District
SJRWMD	St. John River Water Management District
SWFWMD	Southwest Florida Water Management District
SWUCA	Southern Water Use Caution Area
SWRUSA	Southwest Regional Utility Service Area
TDS	Total Dissolved Solids
WSP	Water Supply Plan
WMD	Water Management District
WWTF	Wastewater Treatment Facility

1.0 INTRODUCTION

1.1 BACKGROUND

Water is an essential resource and water supply has become an increased area of focus in recent years for locations throughout the United States. Not only is water required to sustain life, it is also necessary for economic stability. Communities rely on water supplies to support existing populations and future growth. For some, such as those economic markets that rely heavily on tourism or water-consumptive industries, the economic impacts of water supply are even more complex. Water is also tied to quality of life. Lakes, rivers, and wetlands provide opportunities for entertainment or recreation and sustain ecosystem diversity. For all these functions, it is critical that this precious resource be protected for future generations.

As such it is important to remain focused on maintaining a sustainable water supply. Recent water supply planning efforts from a partnership of major regulatory entities and water users, known as the Central Florida Water Initiative (CFWI), have indicated that the traditional groundwater sources are reaching the limit of sustainable supply, and may even require mitigation for impacts of current withdrawals in some locations. Results of these studies indicate that estimated current water uses in the CFWI area are approximately 800 Million Gallons per Day (MGD) (2006-2010). Based on projected regional impacts, the maximum usage from traditional sources without causing unacceptable impacts is estimated to be 850 MGD for the CFWI study area (2014 CFWI RWSP).

Polk County is comprised of seventeen (17) local municipalities and six (6) Polk County Utilities service areas. In response to the anticipated limitations on traditional supplies, and the increased costs associated with the development of alternative water supplies (AWS), the formation of a Polk Regional Water Cooperative (PRWC) and the performance of a regional water supply assessment have been initiated. A cooperative funding agreement was entered into with the Southwest Florida Water Management District (SWFWMD) to fund these formation and assessment efforts (**Appendix A**).

Over the course of this process, all of the stakeholder utilities have been encouraged to participate in developing the legal formation of the PRWC as well as the technical aspects of creating a regional water supply assessment and plan. The following report is intended to document the steps involved in the development of utility water supply deficits, criteria for selection of initial water supply projects for further investigation, and an implementation plan. The process related to the legal formation of the PRWC has been performed in parallel, and is not detailed in this document.

1.2 PURPOSE

The purpose of this document is to provide public supply entities in Polk County and the SWFWMD with:

1. An updated comparison of population projections and resulting demand deficits that can supplement Water Management District (WMD)/CFWI projections.
2. Build upon previous water supply project investigations by assessing the water supplies identified in various regional water supply plans and developing a shortlist of candidate projects that should be further evaluated for supply through the 2035 planning period or beyond, depending on the future population growth.
3. Provide general implementation strategies and schedules to facilitate continued water supply efforts.

1.3 METHODOLOGY

This assessment was performed in cooperation with public water supply entities in Polk County. Every entity was highly encouraged to participate in the process. To gain input and feedback from the County and local governments on the data presented within this report, questionnaires were distributed and a series of four (4) workshops were held amongst the utility representatives (utility directors or city planners). Other members of the technical group consisted of the consultant team for this project, utility support staff, other supporting consultants, and lobbyists. It was the intent that the assessment contain utility specific information and be a reflection of the items held important by the public water supply entities in Polk County.

2.0 POTABLE WATER SUPPLY DEMANDS

2.1 DEMAND PROJECTIONS

Although based on historical quantities and planned future growth, future population and per capita usage are rather uncertain predictions that can be influenced by a substantial number of factors that are difficult to predict with any certainty. Therefore any plans that rely on these variables will require flexibility. In fact, the use of planning documents that are based on demand patterns that involve projections of developments that are anticipated to occur concurrently without being rigidly attached to specific dates are typically more valuable, due to uncertainty in the date when a particular combination of developments and corresponding capacity will be needed. This allows for flexibility of timing, especially given the unpredictable and sporadic growth tied to local and national economies.

Multiple sources for water supply and demand projections are available for the water service areas within Polk County. The Regional Water Supply Plans prepared by the governing WMD's, CFWI summary documents and local or County utility documents all contain water demand projections that include assumptions of water usage and anticipated population increases. A review of these documents has been performed, in an attempt to update projections and encourage coordination among the utilities and the WMD's. This was done so that input from individual utilities could be incorporated. Any differences remaining at the end of the process will be used to create a range of predicted needs for flexibility in the project implementation plan(s).

CFWI demand projections were used as a regional planning tool for consistency amongst the utilities, as this process was approached from a regional perspective. The CFWI projections were developed for each utility service area using the same methodology and planning intervals. However, some local utilities had demand quantities that did not match the CFWI estimates, and these demands were also included as alternate demand scenario. These projects and CWFI projections through 2035 for the local and County-owned utilities are listed in **Table 2-1**.

Since it is the intent of this assessment to update future demands and facilitate coordination amongst the utilities and the WMD's, a questionnaire was sent out to the utilities requesting individual demand projections that correspond to the CFWI timeframe. Local demands, along with CFWI demands were discussed at the first two technical workshops. Projections for each of the planning years were not available in the time frame alloted for inclusion in this report. However, most of the utilities provided quantities for the year 2035. This allowed the consultant team to utilize a consistent timeframe for comparison with the CFWI predictions.

Once the utilities' demands were obtained, the differences between those and the CWFI projections were calculated. The resulting comparison of the CFWI and Utility Demands for 2035 is shown in **Table 2-1**. For those utilities that did not provide demands, the CFWI demands were used. Approximately half of the service area projections differ from the CFWI projections by more than 10%. In fact, in some cases, these differences are as high as 48%. Both projections (i.e., individual utility demands and CFWI demands) were selected for moving forward, as this allows for a range in the predictions for future planning.

Table 2-1: Utility Permitted Quantities and 2035 Utility & CFWI Demand Projections

Water Use Permit (WUP) No.	Utility[a]	Permitted Quantity (AADF MGD)	Permitted Quantity Expiration Date	2035 Demand Projections (MGD)		2035 Projected Demand % Difference (Utility vs. CFWI)
				Utility[b]	CFWI[c]	
7119	Auburndale, City of	7.04	4/3/2034	8.11	7.51	7.4%
341	Bartow, City of	7.90	1/27/2031	6.58	4.84	26.4%
5750	Davenport[d], City of	1.00	1/22/2020	1.16	1.37	-18.1%
5893	Dundee, Town of	0.92	9/6/2022	1.638	1.00	38.9%
6920	Eagle Lake, City of	0.66	4/18/2034	0.95	0.95	0.0%
645	Fort Meade, City of	0.76	4/10/2034	1.00	1.00	0.0%
5870	Frostproof, City of	0.87	12/10/2020	0.83	0.83	0.0%
8522	Haines City, City of	5.92	10/25/2031	6.56	6.56	0.0%
6624	Lake Alfred, City of	1.30	2/28/2033	1.82	1.82	0.0%
2332	Lake Hamilton, Town of	0.38	8/19/2021	0.32	0.20	36.5%
4658	Lake Wales[e], City of	3.90	1/5/2032	4.93	4.61	6.5%
4912	Lakeland Electric and Water,	35.03	12/16/2028	36.34	31.32	13.8%
6124	Mulberry, City of	0.81	11/15/2030	0.38	0.38	0.0%
8468	Polk City, City of	0.76	5/15/2034	1.13	0.97	14.2%
6507	Polk County Utilities - CRUSA	2.00	12/6/2033	2.00	1.58	21.0%
8054	Polk County Utilities - ERUSA	1.37	12/18/2032	1.37	1.49	-8.8%
6509	Polk County Utilities – NERUSA (SWFWMD & SFWMD	13.95	7/31/2027	13.95	11.12	20.3%
6505	Polk County Utilities - NWRUSA[f]	5.70	8/25/2035	5.70	8.46	-48.4%
6508	Polk County Utilities - SERUSA	1.37	4/10/2032	1.37	0.83	39.4%
6506	Polk County Utilities - SWRUSA	7.00	11/17/2029	7.00	6.56	6.3%
4607	Winter Haven, City of	14.06	4/19/2030	15.31	15.14	1.1%

a Town of Hillcrest Heights served by Polk County Utilities. Private utilities (ex. Village of Highland Park) not included.
b Utility demand projections obtained from Polk Regional Water Cooperative - Kickoff Meeting Questionnaire.
c CFWI demand projections are from the CFWI Regional Water Supply Plan, 2015; Appendix A, Table A-1. The demand projections are a function of the permanent population projections and historical gross per capita water use rates and do not include any explicit calculation of factors such as seasonal residents, tourist population, or net commuter population.
d City of Davenport Utility projection reflects year 2030.
e City of Lake Wales Utility projection reflects year 2030.
f The 5.70 MGD permitted quantity was agreed upon with WMD staff and PCU through the issuance of a modified permit on August 25, 2015.

3.0 POTABLE WATER SUPPLY DEFICITS

3.1 PROJECTED DEFICITS

Typically, future water needs/deficits are calculated by comparing projected water demands with the current permitted supplies or allocations. However, recent CFWI reports have indicated that environmental impacts associated with pumping the currently permitted supplies may already exist. It was found that 9 minimum flows and levels (MFLs) for lakes, wetlands, rivers and creeks within Polk County are already not being met. CFWI modeling efforts predict that one additional MFL and three other environmental constraints in Polk County will not meet acceptable levels if currently permitted future pumpage increases through 2035 (CFWI RWSP Appendix B, **Appendix B**). As the intent of this plan is to encompass the possible uncertainty range in projected future deficits, a different approach was utilized which does not consider currently permitted supplies. Because currently permitted supply allocations are anticipated to decrease, using these allocations to predict future water supply availability could result in significantly underestimated deficit projections.

As previously mentioned, the CFWI analyses showed that an increase of 50 MGD across the five-county planning area could "be achieved with relatively high level of confidence without causing unacceptable impacts" with additional local impact mitigation. This 50 MGD represents an approximate 6% increase above recent historical pumpage on a regional basis. Although it is known that impacts will vary across Polk County and the CFWI region, the exact impacts in each service area and the resulting constraints on each permitted water user have yet to be determined. In addition, the regulatory implications of the CFWI results are still under consideration. Thus, based on guidance from the SWFWMD during the September 8, 2015 PRWC Technical Group meeting, a 6% increase above the average annual daily pumpage from 2006 to 2010 for the region was used as a planning estimate of supplies available from traditional potable sources. This was used with the understanding that some utilities may be capable of increasing pumpage higher than 6% and other utilities (such as those on the Lake Wales Ridge) may have to reduce or change the location of historical pumpage in order to address current environmental impacts.

To coincide with the CFWI planning period of 2006-2010 for which existing impact levels were assessed, the historical average pumpage during this timeframe for the utilities was calculated as presented in **Table 3-1**. Cumulatively, the utilities within Polk County pumped approximately 68 MGD (sum of the utilities 2006-2010 average pumpage quantities from CFWI). Applying the 6% increase in total pumpage results in an anticipated 72 MGD of sustainable supply. Water supply demand projections were applied to this modified, projected future supply from traditional sources rather than the current permitted quantities. Comparing both the CFWI-estimated and updated utility-provided demand projections to the 72 MGD supply level, the 2035 demand deficits are estimated to fall between 36-46 MGD (**Table 3-2**).

As with all planning-level estimates, these deficits are based on the best information currently available. Additionally, these quantities are based on gross per capita water usage which is assumed to remain constant over time. The gross per capita water use is the sum of all water uses (residential, industrial, commercial, recreational, etc.) derived from public water supplies divided by the number of residents in the public water supply service area. Thus, the gross per capita water use is greater than the average amount of water used by each resident because it includes uses from other categories of user. If the public water suppliers in Polk County implement additional conservation programs, the gross per capita water use could decrease and result in lower deficits. Gross per capita water use could also increase during the planning period, especially if the percentage of non-residential water use increases or if residential development patterns favor a higher percentage of single family residential units with large irrigated areas. This methodology of holding gross per capita water usage constant is favored because previous trends in water use and conservation planning efforts ongoing in the Polk County area indicate that an increase is unlikely. Holding the future per capita water use at historical averages is a conservative approach, which would result in planning for future alternative water supply requirements at the earliest probable date. Assuming that per capita water use will decrease is a less conservative approach. It requires an assumption on the rate at which future water use will decrease. If this rate is not achieved, it could result in a lack of available future water supply since alternative projects typically take longer to implement than traditional supplies. Accordingly, this approach may require that interim project solutions be considered to build flexibility into a long-term plan.

Table 3-1: 2006-2010 Historical Average Pumpage

Water Use Permit (WUP) No.	Utility[a]	Historical Pumpage Quantity (AADF MGD)[b]
7119	Auburndale, City of	4.55
341	Bartow, City of	3.17
5750	Davenport, City of	0.69
5893	Dundee, Town of	0.56
6920	Eagle Lake, City of	0.31
645	Fort Meade, City of	0.70
5870	Frostproof, City of	0.60
8522	Haines City, City of	3.93
6624	Lake Alfred, City of	0.97
2332	Lake Hamilton, Town of	0.28
4658	Lake Wales, City of	2.87
4912	Lakeland Electric and Water, City of	23.31
6124	Mulberry, City of	0.42
8468	Polk City, City of	0.33
6507	Polk County Utilities - CRUSA	1.14
8054	Polk County Utilities - ERUSA	0.47
6509	Polk County Utilities – NERUSA (SWFWMD & SFWMD	6.28
6505	Polk County Utilities - NWRUSA	3.24
6508	Polk County Utilities - SERUSA	0.59
6506	Polk County Utilities - SWRUSA	3.59
4607	Winter Haven, City of	10.26

a Town of Hillcrest Heights served by Polk County Utilities. Private utilities (ex. Village of Highland Park) not included.
b Historic pumpage 2006-2010. Data from SWFWMD.

Table 3-2: Predicted Deficits when Using WMD 6% Increased Pumpage Planning Tool

Utility	Historical Pumpage Quantity (AADF MGD)[a]	Historical Pumpage Quantity *1.06 (AADF MGD)	2035 Demand Projections (MGD)		Historical Pumpage Quantity *1.06 - City Demand (Surplus or Deficit)	Historical Pumpage Quantity *1.06 – CWFI DEMAND (Surplus or Deficit)
			Utility[b]	CFWI[c]		
County-Wide Totals	68	72	118	108	-46	-36

a Sum of the 2006-2010 average pumpage for the utilities from CFWI .
b Utility demand projections obtained from Polk Regional Water Cooperative - Kickoff Meeting Questionnaire.
c CFWI demand projections are from the CFWI Regional Water Supply Plan, 2015; Appendix A, Table A-1. The demand projections are a function of the permanent population projections and historical gross per capita water use rates and do not include any explicit calculation of factors such as seasonal residents, tourist population, or net commuter population.

4.0 WATER SUPPLY PROJECTS

4.1 PREVIOUS STUDIES

Numerous water supply and resource management plans have been developed in recent years which contain local and regional planning information pertaining to the utilities in Polk County (**Appendix B**). The reports reviewed include:

- 2006 Southern Water Use Caution Area (SWUCA) Recovery Strategy
- 2009 Polk County Comprehensive Water Supply Plan (PCCWSP)
- 2010 Winter Haven Sustainable Resource Management Plan
- 2012 Winter Haven Reclaimed Water Aquifer Recharge Feasibility Study
- 2014 CFWI Regional Water Supply Plan RWSP (revisions from 2015 pending)
- 2015 CFWI Water Resources Protection and Water Supply Strategies Plan ("Solutions Plan")
- 2015 Draft SWFWMD and South Florida Water Management District (SFWMD) Regional Water Supply Plans (RWSPs)

The SWUCA Recovery Strategy was developed in 2006. This report presented a recovery strategy to restore flows to the Upper Peace River and lake levels throughout Highland and Polk Counties, as well as slow salt water intrusion. The recovery efforts were in response to declining aquifer levels which have since stabilized but continue to have environmental impacts. These impacts were not limited to the aquifer, and included flows in the Peace River and lakes/surface water bodies throughout the planning area. At the time, the WMD was developing MFLs throughout the region and a number of them were not being met. The plan included both traditional and alternative water supplies to help meet the stated recovery goals of the SWUCA.

The PCCWSP was a water supply plan funded by Polk County, the SWFWMD, and the SFWMD. This 2009 report identified and quantified viable water supply sources including conservation, reclaimed water, surface water, groundwater (LUT and LFA), and regional sources. This report summarized individual utilities planning options, as well regional water supply project options. Strategies to meet the future needs of all Polk County residents were presented on a local and regional basis.

The City of Winter Haven Sustainable Resource Management Plan was developed in 2010 in response to city-wide fluctuating water resource events caused by seasonal variations. One of the main focuses for the City was to manage their water resources to meet the long term goals of the residents as well as natural systems. Instead of focusing on the components individually, the plan incorporated strategies to manage their water sources on a holistic basis, including rainfall, floodwater, stormwater, reclaimed water and groundwater. The intent was also for both public and private entities to work together to maximize environmental benefits and minimize unintended negative results. The plan identified two primary means for restoring and maintaining the watershed: 1) increasing treatment and infiltration (recharge) and 2) increasing storage and conveyance (to optimize storage and direct water toward the most beneficial locations). Numerous alternatives were identified for the City to pursue for both of these approaches.

The 2012 Winter Haven Reclaimed Water Aquifer Recharge Feasibility Study was conducted in response to the 2010 Sustainable Resource Management Plan. This report reviewed regulations, potential locations for recharge, and beneficial impacts associated with using reclaimed water for aquifer recharge. As a result, multiple sites were identified that Winter Haven could continue to pursue for achieving significant benefits.

The CFWI RWSP was jointly developed by three WMDs (SWFWMD, SFWMD & SJRWMD), in coordination with the Department of Environmental Protection (DEP), FDACS, utility representatives, agriculture representatives, industry representatives, environmental advocacy representatives and the general public. This document serves to update the three district WSPs for the counties located within the CFWI Planning Area (Orange, Osceola, Seminole, Polk, and southern Lake Counties). The plan identifies projects that are intended to ensure adequate and sustainable water supplies through 2035 while protecting the environmental and water resources. Development of the CFWI RWSP was a lengthy and inclusive process, with upwards of 120 public workshops, presentations, and meetings. A main goal throughout the CFWI process was to have consistent planning methods and tools across the planning region. For example, a method of demand projections used for the CFWI RWSP was developed for all and applied to all of the utilities. Additionally, a unified groundwater model was developed for most of the CFWI planning area. The CFWI groundwater model boundary fell within Polk County leaving a small strip on the western edge of Polk County excluded from the model domain. The resulting constraints on modeled local groundwater withdrawal impacts in Polk County are an additional source of future uncertainty.

A separate CFWI Solutions Planning Team evolved during the course of the CFWI process. The purpose of the Solutions Team is to develop a strategy planning document further the RWSP effort in addressing the future water supply needs of the planning region. The Solutions Plan Team used the CFWI estimated 850 MGD as a baseline for evaluating water supply projects and water resource development strategies to meet the 250 MGD demand deficit predicted by the CFWI groundwater availability team. The Solutions Plan identified 150 potential alternative or non-traditional water supply projects for the five-county planning region. This effort culminated in a report titled the 2035 Water Resources Protection and Water Supply Strategies Plan and was adopted with the CFWI RWSP in 2015 (after the drafting of this report and was therefore not incorporated into the final).

Florida Statutes require that WMDs develop regional water supply plans. The draft 2015 SWFWMD RWSP was developed in accordance with these Statutes and with DEP guidelines. Such regional plans serve as a tool for the Districts to make decisions on water management. The draft 2015 RWSP contained alternative water supply project options and their associated costs that water users may evaluate for implementation as individual projects or in conjunction with their own projects.

In lieu of repeating past efforts, a review of each of these existing plans was completed to produce a list of 205 AWS and non-traditional supply projects that could be implemented in Polk County (**Appendix C**). In addition to the projects listed in these plans, all PRWC stakeholder utilities were given the opportunity to contribute additional projects or groupings of projects that may not have been included in previous studies. It should be noted that additional projects proposed by the stakeholder utilities have not undergone the same level of review as the other project previously identified in the regional planning documents. The following three projects were assigned numbers and added to the list by the PRWC technical group:

- (153) Winter Haven Beneficial Reuse – This project is a combination of an expansion of Plant II, along with 3 projects (sites 1, 12, & 22) from the Reclaimed Water Aquifer Recharge Feasibility Study and an industrial reuse project. The project is estimated to cost approximately $12.2M and is projected to yield approximately 2.6 MGD of groundwater supply (50% offset of the total 5.2 MGD).
- (208) Winter Haven Peace Creek Cluster – This project consists of consolidating 2009 PCCWSP Project Nos. S-17 and R-02. It includes a reservoir, 5 separate surface water storage sites, and an aquifer recharge and recovery system. The project is estimated to cost $60M to obtain 5.2 MGD groundwater supply (50% offset of 10.4 MGD).
- (NEW) West Polk County LFA – This project consists of LFA wells, advanced treatment, and piping for distribution. It is anticipated that this project would be located within the Lakeland or Winter Haven service areas. The project cost was estimated at $90M with an estimated yield of 16 MGD.

5.0 WATER SUPPLY PROJECT ASSESSMENT

5.1 SHORTLISTING PROJECTS FOR FUTURE INVESTIGATIONS

The 205 projects identified from the previous plans (**Appendix C**), in addition to the three (3) projects added by local utilities, were reviewed and narrowed down to a manageable list of potential projects for the PRWC stakeholders to investigate further. Narrowing the list was a multi-step process facilitated by the consultant team which relied solely on input and review from the PRWC stakeholders' technical members.

As a first step, the initial list of 208 projects was sorted using the CFWI Solutions Plan project option selection criteria. The purpose of this step was to prioritize those projects that were more suitable for regional implementation. The evaluation was conducted utilizing the following criteria:

- groundwater projects with 5 MGD or greater capacity,
- reclaimed water projects with 1 MGD or greater capacity,
- surface water projects with 10 MGD or greater capacity,
- and stormwater projects with 1 MGD or greater capacity.

Using yield as an initial sorting criteria helped enable the team to identify a project blend that would achieve a more optimum balance between supply and cost. In combination with this process, placeholder projects that would involve the clustering of a number of smaller projects were also included to address concerns that the CFWI criteria may eliminate too many potential projects. Such projects included a conservation "cluster", LFA blending "cluster", and others. The list of 9 projects that resulted from sorting, adding new and cluster projects, and extensive discussion with the stakeholders are summarized as follows (refer to meeting notes in **Appendix D**):

<u>Reclaimed Water</u>

- 100, Reuse Expansion in Polk Co. Northeast Regional Wastewater Treatment Facility (NERWWTF) 2011-2035 - pipeline expansion and potential booster station to supply an additional 1.5 MGD of reclaimed water to customers.
- FKA 153/New, Winter Haven Beneficial Reuse "Cluster" - consists of 0.6 MGD Plant II expansion, interconnects, industrial reuse and three recharge sites.
- 118, Regional Reclaimed Water Interconnects – estimated 20 reclaimed water interconnects among all entities to exchange available reclaimed water.

<u>Surface Water</u>

- 185, Polk County Regional Alafia River Basin – Harvest Alafia River high flows, treatment and reservoir storage for supply to west side of Polk County. This includes one or more intake structures, pump stations, raw water transmission, preliminary treatment, storage, and transmission to end-users who will retreat depending on blending requirements.
- 202, Peace River/Land Use Transition Treatment Facility and Reservoir – Combination of a reservoir and treatment of harvested Peace River flows as well as inclusion of a land use transition wells. This includes an intake structure, pump station, surface water treatment and transmission.
- 208/New, Winter Haven Peace Creek Surface Water Storage - Combination of Peace Creek Reservoir and treatment for 1.1 MGD, Peace Creek Sapphire Necklace surface storage (18 wetland storage sites) for 14 MGD, and an aquifer recharge and recovery water exchange system.

<u>LFA Groundwater</u>

- 209, LF GW Blending "Cluster" – Consists of Lower Floridan aquifer deep wells in each service area to increase the current supply by 10% through blending of LFA water with current production such that treatment is not necessary.
- 13, SE Polk Co Wellfield – Construction of 14 new Lower Floridan aquifer wells, advanced reverse osmosis (RO) water treatment facilities, three deep disposal wells, and transmission infrastructure.
- New, West Polk County LFA Deep Wells – consists of several Lower Floridan aquifer wells, pump station, filtration and RO treatment and deep well disposal of concentrate to provide approximately 17 MGD of potable water.

The PRWC stakeholders recognize the importance of reclaimed and conservation projects as they relate to alternative water and non-traditional water supplies. However, the team opted to address these types of projects separately as parallel efforts in addition to the potable supply projects above to meet the 2035 demand deficit. As such, these projects are included with the remaining projects as an appendix to the 9 selected projects and were not evaluated further.

5.2 MULTICRITERION DECISION ANALYSIS DEVELOPMENT

The next step in the process was to apply a multi-criterion decision analysis (MCDA) tool to the remaining projects. This process is a systematic, transparent approach that allows for the evaluation of discrete alternatives with complex decision making variables. Project selection criteria are determined, ranked, evaluated, and then applied with mathematical methods to determine a ranking of alternatives. To apply the MCDA to the nine selected projects, a questionnaire to determine the ranking criteria was completed by the PRWC stakeholders and submitted to the technical team. The resulting list was discussed at length to eliminate overlap and select criteria that would best represent the priorities of the stakeholders. The consensus was that six criteria should be used to rank each project. These criteria were ranked in order of importance and given weights by the PRWC stakeholders. The results follow

- Cost: capital and O&M – weight of 54
- Yield: MGD produced – weight of 51
- Finished water quality – weight of 46
- Environmental/physical impact/community acceptance – weight of 45
- Timing: does the supply match the deficit (immediate and long term) – weight of 32
- Proximity: water supply's physical proximity to the populations with projected water deficits - weight of 24

5.3 CRITERIA SCORING OF SHORT LIST OF PROJECTS

Once these criteria were developed, scoring of the short list of projects was necessary prior to inputting values into the MCDA. The following subsections describe the methodology for applying the selected criteria to each of the shortlisted projects.

5.3.1 Cost

A cost comparison using data from various water supply reports was performed. For the Regional Reclaimed Interconnect Project, costs were estimated by the consultant team. In addition, for projects that were associated with reclaimed water, a $0.50 per thousand gallons (kgal) was added to the project cost to account for the costs associated with public water supply production since it is necessary to pay for the cost of production of the potable water in addition to the cost of the offset project that made the potable water available. The SWFWMD provided preliminary determinations of which projects would be eligible to receive regional funding through the PRWC. It should be noted that applications for local-level cooperative funding agreements can be completed for all projects, but there is a separate evaluation process for regional projects which rank higher in funding priority. The following projects meet the criteria for regional funding. While District co-funding is not guaranteed, an assumed 50% cost share was applied to the capital cost during the project scoring process:

- 118, Regional Reclaimed Water Interconnects
- 185, Polk County Regional Alafia River Basin
- 202, Peace River/Land Use Transition and Treatment Facility and Reservoir
- 13, SE Polk Co. Wellfield
- New project, West Polk LFA Deep Wells

The following projects are unlikely to receive funding so no cost share was applied to the capital cost:

- 100, Reuse Expansion in Polk C. NERWWTF 2011-2035
- FKA 153, Winter Haven Beneficial Reuse “Cluster”
- 208, Winter Haven Peace Creek Surface Water Storage
- 209, LF GW Blending “Cluster”

Results from the cost comparison are summarized in **Table 5-1**. Note that actual costs were used in the project scoring for the cost criteria.

Table 5-1: Comparison of Costs and Potential Cost Sharing/Score for Short-Listed Projects

Project No.	Project Name	Capital Cost ($ Mil)	Potential Cost Share (Estimated 50%)	Capital Cost After Cost Share/Score ($Mil)	Production Cost/ Score ($/kgal)	Note
100	Reuse Expansion in Polk C. NERWWTF 2011-2035	$11.8	N	$11.8	$2.32	1
FKA 153	Winter Haven Beneficial Reuse “Cluster”	$12.2	N	$12.2	$1.25	2
118	Regional Reclaimed Water Interconnects	$200.0	Y	$100.0	$3.10	1
185	Polk County Regional Alafia River Basin	$263.4	Y	$131.7	$4.33	1
202	Peace River/Land Use Transition and Treatment Facility and Reservoir	$222.4	Y	$111.2	$4.42	1
208	Winter Haven Peace Creek Surface Water Storage	$60.0	N	$60.0	$3.50	2
209	LF GW Blending “Cluster”	$91.4	N	$91.4	$1.78	3
13	SE Polk Co. Wellfield	$320.0	Y	$160	$1.52	1
New	West Polk LFA Deep Wells	$89.0	Y	$44.5	$2.42	4

1 Data obtained from RWSP
2 Added projects together for capital & used typical water projects (reclaimed or surface)
3 Data obtained from RWSP median cost range
4 Provided by Lakeland

5.3.2 Timing

Timing for the projects was split into two categories; 1) timing to plan, design and construct a project and 2) timing until the total yield of water supply is available. This second component was included because the yield estimated for a few projects are based on 2035 projections and, therefore, the quantity is not available today. Typically this was for reclaimed water projects, but it can also apply to LUT projects as there is uncertainty related to when these wells will transition to public supply. The results of these are shown in **Table 5-3** and **Table 5-2**. Note that implementation times were used in the scoring of the projects for the timing criteria.

Table 5-2: Implementation Time/Score for Short-Listed Projects

Project No.	Project Name	Implementation Time /Score (years)	Timing Components
100	Reuse Expansion in Polk C. NERWWTF 2011-2035	1.7	Preliminary Design, Construction Permit, Design, & Construction
FKA 153	Winter Haven Beneficial Reuse "Cluster"	2.7	Preliminary Design, Construction Permit, Design, Land Acquisition & Construction
118	Regional Reclaimed Water Interconnects	4.3	Preliminary Design, Construction Permit, Design, Land Acquisition & Construction
185	Polk County Regional Alafia River Basin	3.3	Preliminary Design, Construction Permit, Design, Land Acquisition & Construction
202	Peace River/Land Use Transition and Treatment Facility and Reservoir	6.3	Preliminary Design, Construction Permit, Design, Land Acquisition & Construction
208	Winter Haven Peace Creek Surface Water Storage	6.3	Preliminary Design, Construction Permit, Design, Land Acquisition & Construction
209	LF GW Blending "Cluster"	5.1	Test Well Drilling, Well Permitting, Preliminary Design, Construction Permit, Design, & Construction
13	SE Polk Co. Wellfield	6.1	Preliminary Design, Construction Permit, Design, Land Acquisition & Construction[1]
New	West Polk LFA Deep Wells	6.8	Test Well Drilling, Well Permitting,

[1] Permit already issued

Table 5-3: Timing Related to Yield /Score for Short-Listed Projects

Project No.	Project Name	Timing/Score (Years until Yield Available Following Construction)
100	Reuse Expansion in Polk C. NERWWTF 2011-2035	20[1]
FKA 153	Winter Haven Beneficial Reuse "Cluster"	20[1]
118	Regional Reclaimed Water Interconnects	15[2]
185	Polk County Regional Alafia River Basin	0[3]
202	Peace River/Land Use Transition and Treatment Facility and Reservoir	10[2]
208	Winter Haven Peace Creek Surface Water Storage	0[3]
209	LF GW Blending "Cluster"	0[3]
13	SE Polk Co. Wellfield	0[3]
New	West Polk LFA Deep Wells	0[3]

[1] Yield available based on 20 year projections
[2] Partial yield available prior to 20 year projections
[3] Yield available upon construction

5.3.3 Yield

Although yield quantities for most projects were provided in previous water supply reports, an adjustment to account for groundwater supply was applied. Historically, reclaimed projects only provide 50% potable groundwater offsets. This is due to a number of factors, including the lower rates for reclaimed compared to potable water, as well as the less stringent watering restrictions for reclaimed water in some jurisdictions. As such, the potable water yield or offset for reclaimed projects was estimated as half of the originally provided quantities. A summary of the yields for the shortlisted projects is in **Table 5-4**. Note that actual yield was used in the project scoring for this criterion.

Table 5-4: Yield/Score for Short-Listed Projects

Project No.	Project Name	Yield/Score (MGD)
100	Reuse Expansion in Polk C. NERWWTF 2011-2035	0.75[1]
FKA 153	Winter Haven Beneficial Reuse "Cluster"	2.6[1]
118	Regional Reclaimed Water Interconnects	10[1]
185	Polk County Regional Alafia River Basin	10[2]
202	Peace River/Land Use Transition and Treatment Facility and Reservoir	11.1[2]
208	Winter Haven Peace Creek Surface Water Storage	5[1]
209	LF GW Blending "Cluster"	13.13-17.14[2]
13	SE Polk Co. Wellfield	30[3]
New	West Polk LFA Deep Wells	16[2]

[1] Potable yield obtained with 50% groundwater offset
[2] Estimated yield
[3] Yield permitted

5.3.4 Finished Water Quality

For the purpose of this water supply assessment, finished water quality was evaluated based on the potential for blending issues. The assessment is a qualitative review of substantial water quality differences, and not based on a detailed review of each utility's individual water chemistry characteristics. Reclaimed water scores high for quality since it would be represented as a fresh groundwater offset with no new water quality introduced to a distribution system. The Lower Floridan aquifer groundwater blending project scores low due to adverse water quality impacts resulting from high total dissolved solids (TDS). For the Lower Floridan aquifer blending projects, the quantities were estimated for blending that resulted in a finished water that still met primary drinking water standards without reverse osmosis (RO) treatment. A summary of the resulting finished water quality scoring is contained in **Table 5-5**. Note that a numeric scale of 3 for high; 2 for medium; and 1 for low was assigned to the finished water quality for this criterion.

Table 5-5: Finished Water Quality and Score for Short-Listed Projects

Project No.	Project Name	Finished Water Quality	Score	Assumptions/Justifications
100	Reuse Expansion in Polk C. NERWWTF 2011-2035	High	3	Groundwater offset
FKA 153	Winter Haven Beneficial Reuse "Cluster"	High	3	Groundwater offset
118	Regional Reclaimed Water Interconnects	High	3	Groundwater offset
185	Polk County Regional Alafia River Basin	Medium	2	Preliminary treatment only
202	Peace River/Land Use Transition and Treatment Facility and Reservoir	Medium	2	Treated Surface Water and Groundwater, Anticipated Blending Issues Associated with
208	Winter Haven Peace Creek Surface Water Storage	High	3	Groundwater offset
209	LF GW Blending "Cluster"	Low	1	No treatment of LFA. Anticipated Higher TDS and Chlorides When Blending with Existing Groundwater Supplies.
13	SE Polk Co. Wellfield	Medium	2	Includes RO treatment, but Anticipated Blending Issues Associated with Corrosiveness
New	West Polk LFA Deep Wells	Medium	2	Includes RO treatment, but Anticipated Blending Issues Associated with Corrosiveness

5.3.5 Environmental/Physical Impact/Community Acceptance

This criterion was split into environmental impacts and community acceptance for separate analysis and scoring. It was assumed that physical impact was an overlap of components in each category. Environmental impacts were scored based on carbon footprint (energy costs), ecological impacts, and resulting residuals. Ecological impact considered both met and violated MFLs, CFWI wetland impacts, and CFWI groundwater flow model areas of greatest impact. Residuals were considered in terms of the impact to water quality on surface water bodies. Community acceptance impacts were determined by the utilities based on knowledge of their communities.

The carbon footprint scores were directly related to energy costs. Projects which optimize existing infrastructure were considered as small impacts to carbon footprint. As treatment and transmission components are required to implement projects, scores increase to medium and high depending on the associated energy intensities. The applied carbon footprint scores for each project is summarized in **Table 5-6**. Note that a numeric scale of 3 for large; 2 for medium; and 1 for small was assigned to the carbon footprint aspect for this criterion.

Table 5-6: Carbon Footprint Aspect and Score of Short Listed Projects

Project No.	Project Name	Carbon Footprint Aspect	Score	Assumptions/Justifications
100	Reuse Expansion in Polk C. NERWWTF 2011-2035	Medium	2	Additional Storage and Pumping
FKA 153	Winter Haven Beneficial Reuse "Cluster"	Medium	2	Additional Storage and Pumping
118	Regional Reclaimed Water Interconnects	Small	1	Maximizes Use of Existing Infrastructure
185	Polk County Regional Alafia River Basin	Large	3	High Energy Consumption for Treatment and Transmission
202	Peace River/Land Use Transition and Treatment Facility and Reservoir	Medium	2	Additional Storage and Pumping
208	Winter Haven Peace Creek Surface Water Storage	Medium	2	Additional Storage and Pumping
209	LF GW Blending "Cluster"	Medium	2	Additional Wells and Pumping
13	SE Polk Co. Wellfield	Large	3	High Energy Consumption for Treatment and Transmission
New	West Polk LFA Deep Wells	Large	3	High Energy Consumption for Treatment and Transmission

Ecological scores were also ranked on a three-tiered scoring method: low, medium and high (**Table 5-7**). A low score indicates that a project is anticipated to have the least impact on the environment. The anticipated impacts to regions considered both the nature of the project and its proximity to two major physical features: a) existing MFLs that are already anticipated to be violated and b) areas of greater predicted surficial aquifer water level change. These MFLs and CFWI ECFT model result figures are shown for reference in **Figure 5-1**. For example, reclaimed projects scored low since they are groundwater offset projects with no additional withdrawals and therefore no additional impacts to existing ecological features. The applied ecological aspect scores for each project is summarized in **7**. Note that a numeric scale of 3 for high; 2 for moderate; and 1 for low was assigned to the carbon footprint aspect for this criterion.

Table 5-7: Ecological Aspect and Score of Short Listed Projects

Project No.	Project Name	Ecological Aspect	Score	Assumptions/Justifications
100	Reuse Expansion in Polk C. NERWWTF 2011-2035	Low	1	Groundwater offset, no additional impacts, limited physical footprint.
FKA 153	Winter Haven Beneficial Reuse “Cluster”	Low	1	Groundwater offset, no additional impacts, limited physical footprint.
118	Regional Reclaimed Water Interconnects	Low	1	Groundwater offset, limited physical footprint.
185	Polk County Regional Alafia River Basin	Medium	2	No violated MFLs in region but in close proximity to SWUCA and significant physical footprint.
202	Peace River/Land Use Transition and Treatment Facility and	Medium	2	Land-use transition net benefit, but withdrawal rivershed has a violated MFL and significant physical footprint.
208	Winter Haven Peace Creek Surface Water Storage	Low	1	Though reservoir is proposed, wetland restoration is involved. Limited change to existing physical footprint.
209	LF GW Blending “Cluster”	High	3	Additional UFA pumping, moderate physical footprint.
13	SE Polk Co. Wellfield	Low	1	Withdrawals occur on Lake Wales Ridge, but area of high confinement. Model predicted minimal impact. Relatively small physical footprint.
New	West Polk LFA Deep Wells	Medium	2	Withdrawals occur on the Lakeland Ridge, potentially higher connection to wetlands, relatively small physical footprint.

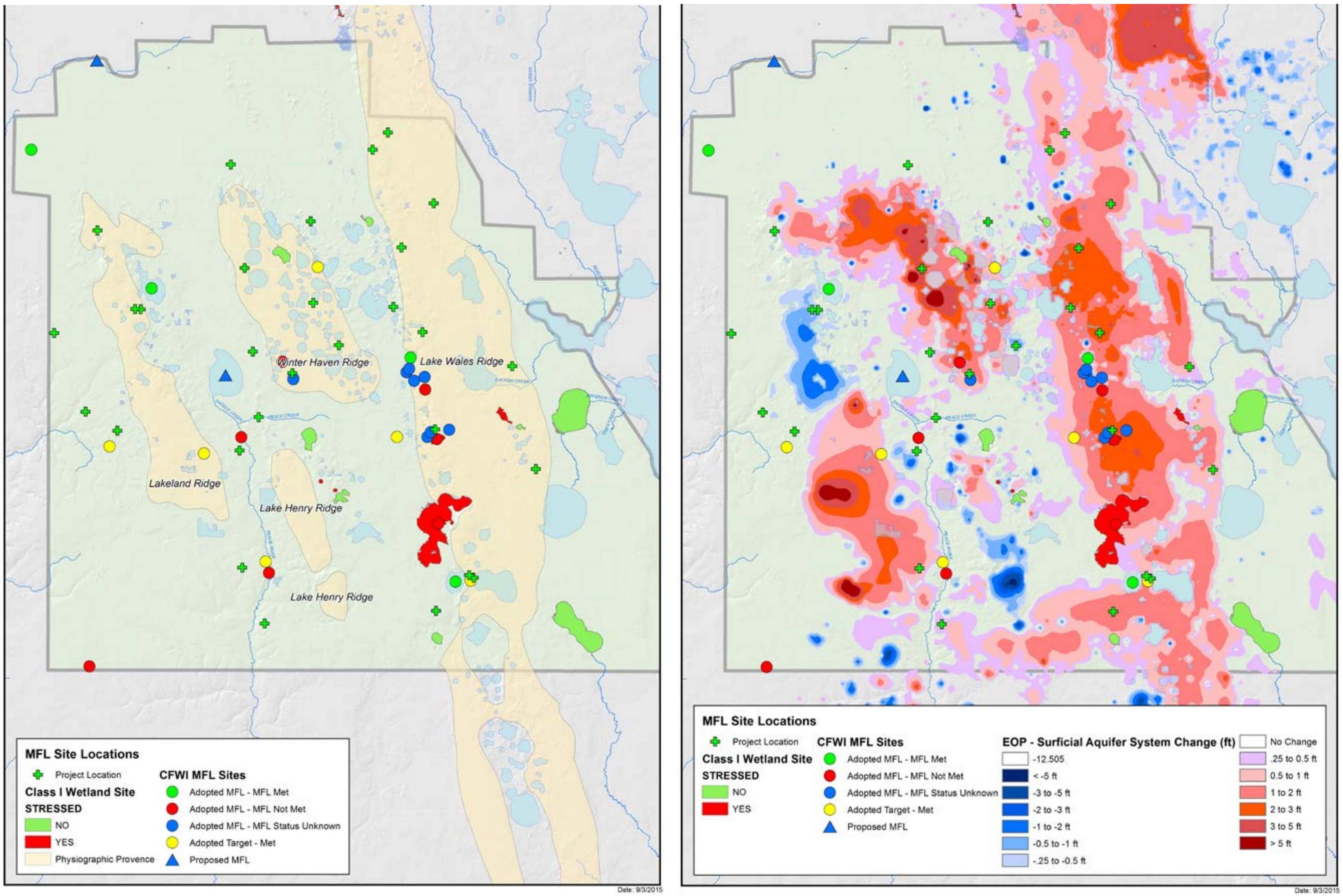

Figure 5-1: Anticipated MFL impacts from CFWI

Projects were also ranked based on whether the water treatment plant will include residual waste streams that will require disposal or would diminish the water quality in local water bodies. Residual scores were also ranked based on minimal, medium, and significant. The LFA groundwater blending project scores poorly (significant) for residuals due to the potential gradual, cumulative impact that elevated TDS in water used for irrigation would have on wetland systems, other surface water bodies, and underlying groundwater systems. Reclaimed water projects scored well (minimal) since there would be no changes to existing reclaimed water practices. Results from this analysis are provided in **Table 5-8**.Note that a numeric scale of 3 for significant, 2 for medium, and 1 for minimal was assigned to the residuals aspect for this criterion.

Table 5-8: Resulting Residuals and Score of Short Listed Projects

Project No.	Project Name	Residuals Aspect	Score	Assumptions/Justifications
100	Reuse Expansion in Polk C. NERWWTF 2011-2035	Minimal	1	Surface water quality related to increased reclaimed water use.
FKA 153	Winter Haven Beneficial Reuse “Cluster”	Minimal	1	Surface water quality related to increased reclaimed water use.
118	Regional Reclaimed Water Interconnects	Minimal	1	No treatment changes
185	Polk County Regional Alafia River Basin	Medium	2	Surface water treatment process residuals, including chemical usage
202	Peace River/Land Use Transition and Treatment Facility and Reservoir	Medium	2	Surface water treatment process residuals, including chemical usage
208	Winter Haven Peace Creek Surface Water Storage	Minimal	1	Surface water quality related to increased reclaimed water use.
209	LF GW Blending “Cluster”	Significant	3	Surface water quality related to increase in TDS in irrigation.
13	SE Polk Co. Wellfield	Medium	2	Confined concentrate disposal
New	West Polk LFA Deep Wells	Medium	2	Confined concentrate disposal

Community acceptance was scored by the PRWC stakeholders based on their knowledge of their service areas. In general, it was determined that reclaimed projects are already widely accepted in the community, and that the benefits from these are easy to "sell." The surface water projects with reservoirs may be less accepted due to the visibility of the construction of the reservoirs and their perceived effects on the flow regimes of the rivers. The wellfield projects were scored moderate due to their remote locations but large infrastructure. Community acceptance was scored by the primaries as follows, with 1 being the least acceptable and 3 being the most acceptable:

- 100, Reuse Expansion in Polk Co. NERWWTF 2011-2035 = 3
- FKA 153, Winter Haven Beneficial Reuse "Cluster" = 3
- 118, Regional Reclaimed Water Interconnects = 3
- 185, Polk County Regional Alafia River Basin = 1
- 202, Peace River/Land Use Transition Treatment Facility and Reservoir = 1
- 208, Winter Haven Peace Creek Surface Water Storage = 3
- 209, LF GW Blending "Cluster" = 1
- 13, SE Polk Co Wellfield = 2
- New, West Polk County LFA Deep Wells = 2

5.3.6 Proximity

Projects were scored for proximity based on the number of miles from the supply source to the customer base. For multi-jurisdictional projects, the distance was taken to a centralized service area with existing and assumed future interconnects to transport water to other service areas. **Figure 5-2** shows project locations within Polk County. A summary of the mileage for the projects is presented in **Table 5-9**. Note that actual estimated mileage from supply source was used in the project scoring for this criterion.

5.4 MCDA RESULTS

The evaluated criteria were entered into the MCDA to determine rankings of the short listed projects as summarized in **Table 5-10** (**Appendix E**). Using a weighted average method of taking the selected, weighted criteria and applying the scores assigned to each project, the projects were ranked as follows:

1. FKA 153, Winter Haven Beneficial Reuse "Cluster"
2. 100, Reuse Expansion in Polk Co. NE Reg. WWTP 2011-2035
3. New, West Polk County LFA Deep Wells
4. 208, Winter Haven Peace Creek Surface Water Storage
5. 13, SE Polk Co Wellfield
6. 118, Regional Reclaimed Water Interconnects
7. 209, LF GW Blending "Cluster"
8. 185, Polk County Regional Alafia River Basin
9. 202, Peace River/Land Use Transition Treatment Facility and Reservoir

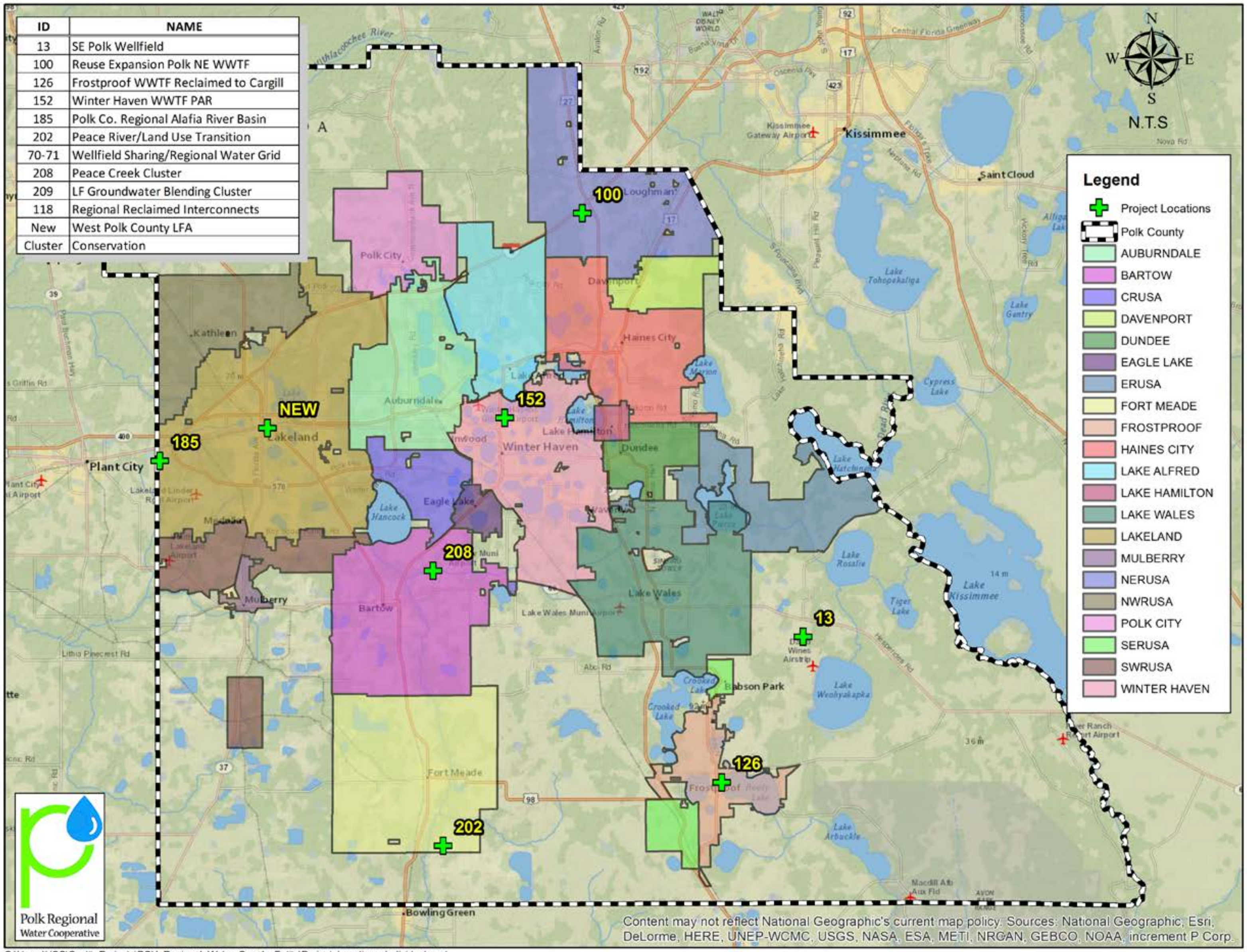

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Figure 5-2: Projects Location Map

Table 5-9: Proximity/Score of Projects Related to Distance to Distribution

Project No.	Project Name	Score/ Proximity (Miles from Source)	Assumptions/Justifications
100	Reuse Expansion in Polk C. NERWWTF 2011-2035	5	Expansion of WWTF and a few miles of pipeline for reclaimed
FKA 153	Winter Haven Beneficial Reuse "Cluster"	5	Distance across portion of Winter Haven Service Area
118	Regional Reclaimed Water Interconnects	15	Approximate interconnects
185	Polk County Regional Alafia River Basin	20	Distance to the center of Lakeland With Assumed Interconnects
202	Peace River/Land Use Transition and Treatment Facility and Reservoir	28	Distance to Winter Haven with assumed interconnects
208	Winter Haven Peace Creek Surface Water Storage	14	Distance across Winter Haven Service Area
209	LF GW Blending "Cluster"	5	Wells are located on or in close proximity to WTP sites
13	SE Polk Co. Wellfield	30	Distance to Winter Haven with assumed interconnects
New	West Polk LFA Deep Wells	5	Wellfield located on or in close proximity to the WTP site and with assumed interconnects.

Table 5-10: Criteria Scoring Summary for Shortlisted Projects

Criteria	Weight	FKA 153	100	New	208	13	118	209	185	202
Cost, Capital ($Mil)	54	$12.2	$11.8	$44.5	$60.0	$160.0	$100.0	$91.4	$131.7	$111.2
Cost, O&M ($/kgal)	54	$1.25	$2.32	$2.42	$3.50	$1.52	$3.10	$1.78	$4.33	$4.42
Yield (MGD)	51	2.6	0.75	16	5	30	10	15.1	10	11.1
Finished Water Quality	46	High (3)	High (3)	Med. (2)	High (3)	Med. (2)	High (3)	Low (1)	Med. (2)	Med. (2)
Environmental Impact, Carbon Footprint	45	Med. (2)	Med. (2)	Large (3)	Med. (2)	Large (3)	Small (1)	Med. (2)	Large (3)	Med. (2)
Environmental Impact, Ecological	45	Low (1)	Low (1)	Med. (2)	Low (1)	Low (1)	Low (1)	High (3)	Med. (2)	Med. (2)
Environmental Impact, Residuals	45	Min. (1)	Min (1)	Med. (1)	Min (1)	Med. (2)	Min (1)	Sign. (3)	Med. (2)	Med. (2)
Environmental Impact, Community Acceptance	45	(3)	(3)	(2)	(2)	(2)	(2)	(1)	(1)	(1)
Timing, Years to Project	32	2.7	1.7	6.8	6.3	6.1	4.3	5.1	3.3	6.3
Timing, Years to Yield	32	20	20	0	0	0	15	0	0	10
Proximity	54	5	5	5	14	30	15	5	20	28
Result	-	**3.29**	**3.16**	**2.97**	**2.91**	**2.88**	**2.94**	**2.62**	**2.20**	**1.98**

Note: In some cases, a higher criterion score is positive (e.g. higher yield) and in some cases it is negative (e.g. cost). The MCDA calculation accounts for this discrepancy and reverses those scales accordingly.

6.0 IMPLEMENTATION STRATEGY

6.1 PRIORITIZED PROJECT SELECTIONS

The MCDA process resulted in a ranking of 9 projects based on criteria agreed upon by the PRWC stakeholders. However, following the stakeholders input on the desired criteria, project yield increased in significance after the WMD indicated that permit allocation adjustments, or reductions, are likely due to the ecological impacts already exhibited with existing pumpage. Therefore, two projects, the 100 (Reuse Expansion in Polk C. NERWWTF 2011-2035) and FKA 153 (Winter Haven Beneficial Reuse “Cluster”) were eliminated due to low yields. While the MCDA method was not re-run to determine the exact revised score, the stakeholders generally concluded that such projects were not adequate regional solutions.

It was also determined by the PRWC stakeholders that the reclaimed water interconnect project is not practical and is a less effective regional project when comparing total yield to project cost. Therefore, the stakeholders removed project 118 Regional Reclaimed Water Interconnects from consideration as an individual project. However, all stakeholders recognize the importance of interconnects and reclaimed water projects in general, and agreed that the PRWC should attempt to implement such projects in the future. As an example, the PRWC may decide to pursue a project that involves the targeted use of reclaimed water to address a regionally-significant MFL constraint.

Lower Floridan blending projects are also seen as less cost-effective and practical because they require pumping of traditional sources for blending and would be implemented by individual utilities. Therefore the PRWC stakeholders agreed that project 209 (LF GW Blending “Cluster”) as it was originally envisioned should not be evaluated further. However, a modification that could be considered is some form of LFA blending alternative as a potential interim solution or possibly as an initial phase in an LFA water supply project (NEW (West Polk LFA Deep Wells) or 13 (SE Polk Co. Wellfield)).

Based on the above, the following five projects were selected by the PRWC stakeholders for further evaluation in Phase 2 and an additional project (Project 209, LF GW Blending “Cluster”) was selected to be further vetted independently from the Phase 2 evaluation:

- 185, Polk County Regional Alafia River Basin
- 202, Peace River/Land Use Transition Treatment Facility and Reservoir
- 208, Winter Haven Peace Creek Surface Water Storage
- 13, SE Polk Co Wellfield
- New, West Polk County LFA Deep Wells
- 209, LF GW Blending “Cluster” (to move on but will not be scored during Phase 2process)

All projects discussed but not scored or further evaluated were placed in appendices so that the entities could have a list of projects that may be implemented on a local basis or could become regional after additional evaluation. Additionally, all stakeholders recognized the importance of conservation and reclaimed projects. They have elected to pursue these types of projects in parallel to the selected five projects for implementation on a local basis and potentially as part of the PRWC in the future.

6.2 ACTION ITEMS/NEXT STEPS MOVING FORWARD

As the Phase 1 Project Plan nears completion, one of the purposes of this water supply assessment is to provide recommendations for those items that still need to be addressed by the PRWC in their pursuit of developing alternative water or nontraditional water supplies to address water supply deficits. Those items include:

1. **Optimization of existing permitted quantities**. One of the most cost effective measures the PRWC stakeholders can take is to maximize the use of the fresh groundwater that is currently available. The optimization of the existing supplies should include:
    - Continue existing conservation efforts and pursue new local and regional conservation efforts using previous reports mentioned in Section 4, as well as attending and becoming involved in the new regional conservation meeting group.
    - The CFWI is forming a conservation group. The WMDs and DEP have allocated funding for conservation projects. It is recommended that the Polk regional conservation group select representatives to be active participants in the scoping and implementation process.
    - Consider running theoretical model scenarios to minimize impacts and maximize withdrawals among the PRWC stakeholders. Since drawdowns are not universal, there is potential that additional sustainable groundwater could be pumped. For example, it's likely that if withdrawals surrounding an identified MFL are reduced, that additional supplies could be withdrawn in other locations. If this is deemed feasible, it could be a more economical solution for utilities to implement than other AWS project.
    - Maximize reclaimed water use. Continue to optimize reclaimed in ways that best suit individual local needs. It doesn't appear that there is a regional solution for utilizing the reclaimed water that would be more beneficial in terms of cost and environmental impacts than current strategies, including public access reuse, sending to industrial users, or using it for local recharge. It is recommended that the utilities select solutions that use reclaimed water in more efficient ways than achieving 50% offsets via public access reuse.
    - Engage in recharge studies to determine the benefits of using reclaimed water to help with MFL recoveries. It's possible that mitigation of MFLs could allow the region to pump additional groundwater.
2. **Develop Regional Interconnects**. It is recommended that evaluations of potential interconnect locations be continued once projects have been selected as the interconnect sizing, locations, and quantities are dependent upon project water supply, source, and location. Additional considerations should be given to combinations of water quality and/or normal operating pressures for each side of the proposed interconnects.
3. **Consider feasibility studies for large transmission mains**. Although the final locations of the smaller interconnects are unknown, it may be beneficial to determine transmission mains between existing water treatment plants that allow for the optimization of existing groundwater supplies while reducing operational issues associated with interconnects. This approach also allows for the conveyance of water once AWS or non-traditional supply projects are selected and implemented.
4. **Continue to be involved in the Polk County leadership coordination meetings.** PWRC stakeholders have been meeting on a bi-weekly basis in conjunction with the Phase 1 process, as well as further investigate other items that are of interest and importance to the utilities.
5. **Attend and engage in CFWI and WMD policies.** The third guiding principal of CFWI, proposed legislation last year, and the proposed MOU being considered requires the three (3) WMDs in CFWI to create consistent rules over the next year. This includes the resolution of the existing permitted quantities. Since previous efforts have proven to be highly involved, it may be more cost effective for the stakeholders to select representatives or rotate representatives to monitor and participate in these meetings.
6. **Stay involved in and contribute to Phase 2.** The WMD stated that if a utility is working towards developing AWS or non-traditional supplies on a regional basis as part of a plan to mitigate impacts, then temporary impacts may be allowed in the interim. Although permitting mechanisms are still undergoing development, it will allow for the continued use of groundwater until transitions to AWS are implemented similar to other scenarios where gap permits have been used. The transition period will also allow for additional development of growth and associated demands, which aids in determining strategies for project development.

6.3 PROPOSED SCHEDULE

The development of alternative water supply projects to meet the estimated county-wide demand deficit range of 36 MGD to 46 MGD will be a dynamic process. Changes to WMD policies, land use, and conservation practices will all have an effect on the implementation schedule. The following recommendations are made to maintain flexibility while reaching long-term goals:

- Keep moving forward with multiple projects since AWS requires longer time frames for implementation and it may become necessary to interchange one project for another as the timing and deficits adjust over time. Interchanging projects could also become necessary in some cases as projects may result in insurmountable technical, fiscal, environmental and/or political obstacles as their details are further developed. If there are only sufficient projects to meet (rather than exceed) future projected demands, and one of them is removed, it results in a situation where the utilities will be without a viable long term solution. Projected capacity redundancy and subsequent elimination of the least favorable excess candidates is the most favorable strategy.
- Assist the WMD with data collection. The CFWI process requires an aggressive data collection effort over the next five years to gather hydrogeological information necessary to improve the CFWI groundwater model and conditions. These hydrogeological parameters can impact project feasibility. Because the results of this model will affect the selection of large capital projects, using the best available information is critical.
- Continue to investigate details of existing candidate projects, as well as the feasibility of new candidate projects.
- Support elected officials in their effort to form the PRWC entity by April 2016.
- Refine the evaluation of projects in Phase 2 that were short listed in Phase 1, and confirm the top project(s) to proceed forward with after April 2016.
- Revisit demand projections with new permitted supplies. It may be beneficial to further investigate the range of uncertainties in the demand projections themselves. CFWI projections are based on BEBR medium population projections multiplied by the historical gross per capita water use rates. For example, demands may fluctuate based on the following:
    - Average regional population growth developing closer to the BEBR high or BEBR low projections
    - The County shows average growth as a region, but the distribution is uneven, with higher than average growth in one or more sub-regions, and the opposite effect in other sub-regions. This is quite a common occurrence as one area gets “hot” and attracts future growth at the expense of other nearby communities. It could leave the PRWC with “adequate” allocated water supplies, but lacking the infrastructure required to deliver them where they are actually required.
    - Future development is significantly different than historical development so that the average per capita water use for residential purposes changes significantly (e.g., upscaling with a higher percentage of large scale homes that have more irrigated area per resident; moving towards higher density development with less “sprawl” – the opposite of the large scale home scenario; significant changes to the percentage of use by those who are not permanent residents [tourists, commercial/industrial, etc.] – this could alter the value of the appropriate gross per capita rate up or down from historical values; etc.
    - Behavioral changes for existing and/or future residents in response to rising water costs (typically, higher costs result in reduced per capita consumption).
- Complete project implementation agreements by April 2017.