# **Draft Process Outline**

## Summary

### Scope Development Process Outline

- A. Develop guiding principles and methodologies
- B. Develop project scope, expectations, and limits
  - 1. Geographic limits
  - 2. Scenario planning
  - 3. Project schedule expectations
  - 4. Public involvement expectations
  - 5. City staff involvement expectations
  - 6. Coordination with other entities
  - 7. Draft methodology for options comparison
- C. Checklist of key IWRP components
- D. Background information to be provided to the consultant
- E. Consultant team expertise areas

#### Plan Development Process Outline

Tasks listed below are interconnected and order does not indicate prioritization.

- 1. Conduct Public Outreach and Participation (throughout the process)
- 2. Develop Methodology for Options Comparison
- 3. Evaluate and Forecast Disaggregated Water Demands
- 4. Conduct Water Conservation Potential Assessment
- 5. Evaluate Impacts of Climate Change on Water Supply and Demand
- 6. Evaluate Water Supply and Diversification Options
- 7. Score Demand and Supply Side Options
- 8. Develop and Evaluate Water Supply and Demand Management Portfolios
- 9. Conduct Financial Analysis and Evaluation
- 10. Score Demand and Supply Side Portfolios
- 11. Develop Plan Recommendations
- 12. Develop Plan Report

# Scope Development Process Outline

#### A. Develop Guiding Principles

Based on 2014 Task Force IWRP recommendations. Not listed in order of priority.

- Sustainable and resilient
- Water use efficiency (conservation and demand management)
- Drought and climate change tolerant
- Improved drought preparedness
- Local focus with regional awareness
- Supply diversity
- Affordable
- Cultural/community shift and change
- Environmentally conscious avoid and minimize adverse environmental impacts
- Consider environmentally beneficial options
- Stewardship of water and environment
- Consistent with Imagine Austin
- Transparent
- Public involvement and collaboration
- Balanced regional water reliability
- Matching water quality to end-use needs

#### B. Develop project scope, expectations, and limits

- 1. Geographic limits
  - AW Service Area
  - AE facilities
  - Other geographic areas of significance: Austin City limits, Austin Metro Area, Region K, river basins and watersheds, aquifers, "local" area, other areas as determined
- 2. Scenario Planning
  - Potential Conditions, including but not limited to:
    - Drought
    - Climate change
    - Wet conditions
  - Potential Time Horizons
    - Year 2020
    - Year 2039/2040 (IA and City of Austin Bicentennial)
    - Year 2070 (to match Region K & state water plan)

- Year 2100
- 3. Project schedule expectations
  - Approximately two year project -starting with Task Force initial meeting
    - Approx. Spring 2015 to Spring 2017
  - Allow time for public meetings including Boards and Commissions
- 4. Public involvement expectations
  - Public involvement and public meetings
  - 2015 Austin Integrated Water Resource Planning Community Task Force
- 5. City staff involvement expectations
  - Austin Water Lead Department
  - Austin Energy
  - Watershed Protection
  - Office of Sustainability
  - Office of Innovation
  - Austin Resource Recovery
  - Parks and Recreation Department
  - Neighborhood Housing and Community Development
- 6. Coordination with other entities
  - Potential consultant coordination
    - Coordination with COA and LCRA Water Partnership
    - Coordination with other entities as appropriate
  - Other entities and governing bodies as appropriate
- 7. Draft methodology for options comparison
  - Refer to AWRPTF matrices with evaluation criteria: Water Conservation and Supply Project
  - Evaluation Matrix as basis for development of evaluation criteria
- C. Checklist of key IWRP components
  - 1. Similar to California Urban Water Management Plan
  - 2. Based on 2014 Task Force IWRP recommendations
  - 3. Including 2015 Task Force input
- D. Background information to be provided to the consultant
  - 1. Consolidate deliverables from prior water supply and water efficiency engineering analyses
  - 2. Imagine Austin Comprehensive Plan

### E. Consultant Team Expertise Areas (from Resolution and 2014 Task Force Report)

- 1. Demonstrated commitment to and expertise in (as stated in Council Resolution 20141211-119)
  - Water conservation and efficiency
  - Water reuse/Water reclamation
  - Distributed and Decentralized Water Systems
  - Sustainable water resource planning
  - Alternative water utility financial models
- 2. Additional areas of expertise (from the 2014 Task Force report)
  - Scenario planning
    - Hydrology and climate
    - Drought scenario water resource planning
  - Modeling
    - Water supply and demands
    - Water Availability Modeling
    - Finance, Econometric
  - On-site systems for reuse
    - Stormwater, Graywater, Wastewater, AC Condensate, Recycled process water
  - Beneficial use of stormwater runoff
    - Rainwater harvesting and catchment
  - Environmental engineering
    - Water treatment and distribution and wastewater collection and treatment
  - Water supply
    - Aquifer Storage and Recovery (ASR)
    - Groundwater, with emphasis on karst systems
    - Legal/Institutional: Texas surface and groundwater law
  - Energy-water nexus
    - Energy efficiency
    - Water use for power production
  - Public outreach
  - Public policy
  - Planning
  - Irrigation

# Plan Development Process Outline

This document is a preliminary proposed sequence of task modules. For the purposes of this document, "Lead" refers to the lead party associated with a task and is not meant to exclude the participation of and input by the public , other City departments, the 2015 Austin Integrated Water Resource Planning Community Task Force (Task Force), and others.



### Task 2 Develop Methodology for Options Evaluation

- a. Refine methodology to provide framework for evaluation of demand-side and supply-side options
  - Refer to 2014 AWRPTF matrices with evaluation criteria and recommended scoring system (see attached – Appendices A, B, and E from July 2014 Task Force Report to Council): Demand Management and Supply Management Evaluation Matrices as basis for development of evaluation criteria
  - Methodology should include consideration of, but not be limited to:
    - Potential yield for demand and supply side options
    - Water supply benefits
      - Supply diversification potential
    - Economic impacts
      - Cost comparisons ("apples to apples"): Including capital costs and operations and maintenance costs, lifecycle costing (including energy and carbon emissions), cost savings, cost benefit analysis
      - Consideration of potential financial incentives
    - Environmental impacts and considerations
    - Social impacts
    - Implementability
      - Intergovernmental partnerships
      - Permitting and regulatory considerations
        - Timing of Implementation
    - Risk
      - Water availability
    - Others

#### **Task 2 Work Products**

- Summary of methodology recommendations for options evaluation
- Standard template for presentation of options evaluation

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## Task 3 Evaluate and Forecast Disaggregated Water Demands

- a. Develop disaggregated demand model. Consider both top down and bottom up approaches.
  - Potential categories
    - Austin Water demands
      - Single-family residential, multi-family residential, commercial, large volume, wholesale, City of Austin
      - Customer end uses
      - Indoor, outdoor
    - Austin Energy: steam-electric (water demands at power plants), other uses
    - Potable, non-potable (reclaimed and auxiliary water)
    - Other regional water demands
      - Parkland irrigation, recreation
      - Trees, farms, and food
      - Fire suppression, wildfire suppression (wildland/urban interface)
      - Creeks, environmental flows, habitat protection
  - Potential drivers
    - Drought contingency plan (DCP) implementation (stages)
    - Climate change impacts
    - Population growth & land use changes
    - Economic drivers (employment forecasts, cost of water/rate impacts)
      - Variable demands due to peaks, summer, winter (and DCP stages)
- b. Develop water needs budgeting options and approaches

#### **Task 3 Work Products**

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- Intermediate disaggregated demand model out to the 2020 & 2039/2040 planning horizons (AW Staff)
- Disaggregated demand model combining the 2020, 2039/2040, 2070, 2100 planning horizons (Potentially IWRP Consultant)
- Preliminary water needs identification, quantification, and benchmarking for water needs budgeting to be used in plan development

### Task 4 Conduct Water Conservation Potential Assessment

- a. Identify demand management options for matrix evaluation
  - Screen conservation programs, policies, and code requirements to determine which options will be evaluated in the matrix
- Evaluate current and potential demand management options according to the methodology developed in Task 2. Consider results of Conservation Comparative Analysis (developed outside of this scope) as applicable.
  - Evaluation of individual conservation programs will potentially include, but are not limited to:
    - Rates and price elasticity
    - Rebates and incentives
    - Water meter options
    - Tools for customers (e.g. water report software, etc.)
    - Outreach and education
    - Conservation audits
    - Water loss reduction for customers
    - Leak detection and reduction programs for the City
    - Evaluate codes and ordinances and suggest code revisions (e.g. auxiliary water, plumbing fixtures, etc.)
    - Evaluate other demand-side management options
  - Conduct cost-benefit analysis, including potential water supply benefits, of individual conservation programs
- c. Review current benchmark information and develop benchmarks for water conservation programs to include cost-benefit and other factors
- d. Identify potential for demand reductions
  - Evaluate current and potential demand management programs as they relate to potential demand reductions
- e. Develop cost and yield data
  - Consider developing cost curves as appropriate
- f. Identify opportunities for coordination with LCRA, BSEACD, wholesale water customers, neighboring utilities and communities
- g. Identify opportunities for cooperative conservation improvements with intra-basin users
- h. Capture AW Conservation progress and accomplishments to date

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		May 5, 2015
	• Review 2012 statistical analysis report that was basis for City of Austin pro rata	
	curtailment plan	
	• List implemented programs and estimated water savings and other metrics	
	Task 4 Work Products	
	Conservation Potential Assessment including benchmarks and cost benefit	
	analysis results	
	Integration of the Conservation Potential Assessment into IWRP	
	Recommendations for coordination with LCRA and others	
	Summary of AW Conservation history	
	List of implemented conservation programs and estimated savings	
Task 5	Evaluate Impacts of Climate Change on Water Supply and Demand	LEAD
a.	Conduct gap analysis of climate change data	Austin Water
	• Review previously conducted climate analyses for Austin and other entities	
	including:	2015 Task Force
	<ul> <li>Temperature and precipitation forecasts developed by ATMOS Research</li> </ul>	Office of
	or a Consulting	Sustainability
	and Consulting	Austin Energy
	• Studies conducted for LCRA and other regional entities	Austin Resource Recovery
	<ul> <li>Identify aspects of previous climate analyses that can be used to evaluate</li> </ul>	Neighborhood
	climate change impacts on water supply and demand	Housing and
	<ul> <li>Identify gaps including location and other parameters</li> </ul>	Community
h	Develop forecasts for climate change impacts on water supply	Office of Innovation
υ.	Develop longetic information based on the sub-bit conducted in Table 5	Parks and Recreation
	Develop climatic information based on gap analysis conducted in Task 5a	Watershed Protection
	<ul> <li>Range of climatic and carbon emissions scenarios will be utilized</li> </ul>	
	Translate all static and institutions to four state for such as such as a distribution in	

- Translate climatic projections to forecasts for water supply and hydrologic parameters that can be used in water availability models including, but not limited to, streamflow and net evaporation
- Climatic and hydrologic projections will be developed for locations within Austin and for locations critical to water supply in Austin such as the Highland Lakes
- c. Develop forecasts for climate change impacts on water demands
  - Identify parameters that will need to be incorporated into disaggregated demand modeling and forecasting

			May 5, 2015
	Task 5 \ •	<b>Work Products</b> Summary report on potential climate change impacts on local climate, hydrology, water supply, and water demand Climatic and hydrologic forecast dataset to be used in water supply and demand management options evaluations	
Task 6 a.	<b>Evaluat</b> Identify	e Water Supply and Diversification Options water supply options for matrix evaluation	LEAD Austin Water
	• Sc	reen options to determine which options will be evaluated in the matrix	Climate Consultant
b.	Evaluate	e water supply options according to the methodology developed in Task 2.	PARTNERS
	Use wat	er availability modeling as appropriate.	2015 Task Force
	• 0	ptions potentially include, but are not limited to:	Austin Energy Watershed
	0	Lake storage and operations	Protection
	0	Off-channel reservoir storage and operations	Austin Resource
	0	Direct rouse (reclaimed water – purple pipe system)	Recovery
	0	bilect redse (reclaimed water – purple pipe system)	Housing and
	0	Indirect reuse (for potable and non-potable)	Community
	0	Outflow from Barton Springs/other local springs and creeks into Lady Bird	Office of Innovation
		Lake	Office of
	0	Green infrastructure	Sustainability
	0	On-site systems for stormwater, graywater, wastewater, AC condensate,	Parks and Recreation
		recycled process water, etc. (decentralized concepts)	
	0	Desalination of brackish groundwater or other saline water sources	
	0	Groundwater	
	0	Aquifer Storage and Recovery (ASR)	
	0	Surface water rights: first in time first in right priority system, Colorado	

- River water rights
- Water rights transfers 0
- Other potential regional projects 0
- In addition to methodology and refined matrix criteria developed in Task 2, key • factors should include but are not limited to:
  - 0 LCRA Water Management Plan: revisions, emergency orders, and LCRA environmental flow requirements

			IVIUY 5, 2015
	0	Austin and LCRA water supply agreements (including but not limited to	
		1999 and 2007 agreements):	
	-	Firm contracts: stored water and run-of-river backup	
		<ul> <li>325,000 AF supply with payment trigger</li> </ul>	
		<ul> <li>Additional supplies for steam-electric demands</li> </ul>	
	0	Surface and groundwater law/permitting	
	0	City of Austin return flows: Joint Application for Reuse (JAR) pending at	
		TCEQ	
	0	Potable/non-potable connection standards and public health and safety	
	0	End use water quality	
	0	Consider potential policy and financial incentives	
	0	Climate change impacts	
	0	Environmental and water quality impacts	
c.	Consider	developing cost curves as appropriate	
d.	Perform	comprehensive reuse analysis	
	• Deve	elop direct reuse (purple pipe) decision model options	
	0	System-type options	
	0	Financial business model considerations	
	0	Water supply aspects in a region/basin-wide context	
	0	Evaluate potential need for code changes	
	• Eval	uate decentralized water reuse options, which may include but are not	
	limit	ed to sewer mining, distributed and outlying satellite systems, combined	
	rain,	/gray/blackwater on-site reuse systems	
	• Eval	uate potential for on-site stormwater management to offset water demand	
	• Con:	sider geospatial analysis of future supply sources (including auxiliary and	
	dece	entralized)	
	0	Reference Sydney Decentralized Water Master Plan	
Tas	k 6 Work F	Products	
	<ul> <li>Supply</li> </ul>	y options evaluation results in template for each strategy as described in	
	Task 2	2	
	• Comp	rehensive reuse analysis summary	

#### LEAD Task 7 Score Demand and Supply Side Options **Austin Water** Score water supply and demand side options using methodology developed in Task a. **IWRP Consultant** 2 PARTNERS Perform reconciliation of scoring parameters including costs for demand and supply b. 2015 Task Force Watershed side options as needed to ensure "apples-to-apples" comparison Protection **Task 7 Work Products** Austin Energy Austin Resource Scored list of demand and supply side options Recovery Neighborhood Housing and Community Development Office of Innovation Office of Sustainability Parks and Recreation Task 8 Develop and evaluate water supply and demand management portfolios LEAD Austin Water Develop process to create, evaluate, and select water supply and demand a. **IWRP Consultant** management portfolios Hydrologist/WAM Consultant Determine performance objectives for portfolios PARTNERS 0 Define acceptable levels of risk and reliability for customers and 2015 Task Force stakeholders **Austin Energy** Watershed Identify evaluative criteria Protection Consider using the same evaluation criteria included within the Austin Resource Recovery methodology developed in Task 2 Neighborhood Identify water supply and demand management portfolio themes Housing and Populate preliminary portfolios with demand and supply side options identified in Community b. Development Task 7 Office of Innovation Conduct Water Availability Modeling (WAM) analysis of preliminary portfolios under c. Office of Sustainability various planning scenarios using WAM conditional reliability modeling (CRM) Parks and Recreation 0 Planning scenarios may include drought of record, period of record, and other hydrological conditions including scenarios incorporating climate change impacts

		IVIUY 5, 2015
d.	As part of an iterative process, evaluate and refine portfolios in various water supply	
	and climate scenarios based on evaluative criteria and performance objectives	
e.	Select portfolios of tiered supply side and demand management options for further	
	evaluation	
Tas	sk 8 Work Products	
	<ul> <li>Prioritized option portfolios with combined storage graphs using conditional reliability modeling</li> </ul>	
	List of selected and prioritized option portfolios for further evaluation	
Гask 9	Conduct Financial Analysis and Evaluation	LEAD

- Evaluate financial considerations of selected option portfolios from Task 9 a.
  - Capture capital and operation and maintenance (O&M) lifecycle costs
  - Capture other financial considerations as needed
- b. Develop and evaluate financing options including, but not limited to, alternate project delivery options and consideration of expansion of the use of impact fees to support projects aimed at improving water use efficiency
  - Identify opportunities for regional partnerships and cooperation, technology cost sharing, and revenue-positive or revenue-neutral capital planning options
  - Evaluate funding mechanisms and requirements for decentralized, graywater, and rainwater harvesting options
  - Explore use of private capital options to finance decentralized infrastructure throughout the city, including a potential Service Extension Request (SER) process approach

#### **Task 9 Work Products**

- Summary of findings from financial analysis and evaluation •
- Summary of findings from financing options evaluation

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May 5, 2015

### Task 10 Score demand and supply side option portfolios

- a. Score demand and supply side portfolios using methodology developed in Task 8
- b. Develop scored list of portfolios

#### **Task 10 Work Products**

• Scored list of demand and supply side portfolios

### **Task 11 Develop Plan Recommendations**

- a. Develop supply and demand management plan recommendations that reflect the community's values, quality of life, affordability, supply diversity, sustainability, drought resilience, and environmental protection
- b. Update short-term tiered drought management plan with implementation stages and multiple strategies (based on drought response planning work from 2014 and 2015)
- c. Develop medium and long term plan recommendations, potentially triggered based on conditions, with time horizons
- d. Identify case studies for demand and supply side options for inclusion in report
- e. Identify emerging issues with supply and demand management options
- f. Develop iterative planning cycle for revisiting issues and building the framework and institutional capacity for fostering innovation

### **Task 11 Work Products**

- Supply and demand management plan recommendations
- Updated short-term tiered drought management plan
- Medium and long term plan recommendations
- Case studies for demand and supply side options

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## Task 12 Develop Plan Report

- a. Develop plan report including implementation plan and process options
  - Develop plan report, including graphics, diagrams, tables and written materials
  - Develop implementation plan and process options for regular plan updates and time-lines

### **Task 12 Work Products**

• Final plan report, including implementation plan and process options

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Sustainability										
Parks and Recreation										

# Attachment:

Appendices A, B and E from

Austin Water Resource Planning Task Force

Report to City Council (July 2014)

# Appendix A

# Water Supply Project Evaluation Criteria - Demand

Recommended COA Drought Response Decision Matrix <u>DEMAND MANAGEMENT</u>

| mments                            |  |   |                                   | stegy is already in place by AWU.   | teges at andy in place by AWU Tark Force supports Stage 3 Intern phote. | whered storage triggers need to be determined for each drought tryponse.  |   
   
   
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| Risk of<br>Iternative<br>Supplies | 10%  | Conditions (Variability of Yield)<br>Hydrologic Storage- Potential<br>Environmental Release   | -                                 |   |   |   |   
   
   
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| Implementability                  | 15%  | Andropok Minaxa parupan<br>Andropok Jusu<br>Jina Manaya Minaya<br>Jina Manaya Minaya<br>Jina Minaya<br>Andropok Minaya<br>Sama Minay |                                   |   |   |   |  
   
   
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| Social Impacts                    | 10%  | Imagine Austin Plan<br>Balances Economic and<br>Environtemental Industry<br>Economy Network<br>Alternation<br>Alternation<br>Industry<br>Alternation  |                                   |   |   |   |   
   
   
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| Environmental<br>Impacts          | 20%  | yanobe<br>wola meatani<br>banateant/banatead<br>banateant/banatead<br>batetan batead<br>batead<br>water Quality   |                                   |   | 12 Martin   |   |   
   
   
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| Economic Impacts                  | 20%  | Unit Cost* (S/Ac+t)<br>Unit Cost* (S/Ac+t)<br>Foregy intension<br>Foregy Ac+AcAt  |                                   |   |   |   |   
   
   
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| Water Supply Benefit              | 25%  | Polimae<br>Drophy Volume<br>Drought finalitience<br>Drought of the stang supplies<br>Draiting Distribution Systems<br>Edisting Distribution Systems<br>Edisting Distribution Systems<br>Cost Control (restlience)   |                                   |   |   |   |   
   
   
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|                                   |  | COA Water Management Strategy Description   | Conservation - (Drought Response) | Stage 3   | Stage 3 Interim (Hand Watering Only)                                    | Stage 4   | Conservation - (Demand Management)  
   
   
   | Mandatory Tollet Retrofit on Residential Resale   
   | (Mandatory Toilet Changeout for Commercial & Multifamily<br>Buildings – Point in Time)   | Limit irrigated area in new residential development   | Require new facilities to capture A/C condensate for reuse   | Require retrofit of existing cooling towers to meet efficiency standards | Require home audits at time of sale  
   
   
   | Mandatory irrigation audits for high users  | Implement smart meters for residential customers  | Additional staff for marketing reclaimed water program   | Water budget rates (applied to irrigation-only meters)  | Hot water on demand incentives   | Provide rebates for 0.8 gpf tokets  
   | Other - (Demand Management)  | Leak Detection   | Direct Reuse; Completion of Core Reuse System   | Building code modifications | Plumbing code modifications  | Stormwater management programs/incentives  
  | Land use management programs/incentives | Gray water use programs/incentives | Developers/industry bring their own water | Participate in LCRA Management Plan process | Water pricing structures | Enter into drought stages earlier  | Incentives for conservation programs | Incentives for rainwater harvesting systems | Water Education Initiatives | Consumption comparison average on water bill |  |
|                                   | Risk of<br>CAR         Water Supply Benefit         Economic Impacts         Environmental<br>Impacts         Social Impacts         Implementability         Risk of<br>Alternative<br>Supples         Comments | Water Supply Benefit         Economic Impacts         Environmental         Social Impacts         Implementability         Risk of<br>Social Impacts         Risk of<br>Impacts         Final         Comments           AC         25%         20%         20%         10%         13%         10%         10%  |                                   | Contraction         Contraction | Joseph Particle Size Size Size Size Size Size Size Siz                  | Sintering of the second sec | Solution       Solution <th< td=""><td>Construction         Construction         Construction</td><td>Image: second second</td><td>Image: constraint of the second of the se</td><td>Image: Second Second</td><td></td><td>Control         Control         <t< td=""><td>Control         Control         &lt;</td><td>Image: problem in the strategy of the s</td><td>Image: problem and problem and</td><td>Image: problem and set of the se</td><td>Mathematical and state and state</td><td>Mathematical state         Mathematical state         Mathema</td><td>Image: problem and problem and</td><td>Image: problem and problem and</td><td>Monton         Monton         Monton&lt;</td><td></td><td>Image: market set in the set in</td><td>Image: Section of the sectio</td><td></td><td></td><td></td><td></td><td></td><td>Image: market set of the set of</td><td></td><td></td><td></td><td></td><td></td></t<></td></th<> | Construction         Construction | Image: second | Image: constraint of the second of the se | Image: Second |  | Control         Control <t< td=""><td>Control         Control         &lt;</td><td>Image: problem in the strategy of the s</td><td>Image: problem and problem and</td><td>Image: problem and set of the se</td><td>Mathematical and state and state</td><td>Mathematical state         Mathematical state         Mathema</td><td>Image: problem and problem and</td><td>Image: problem and problem and</td><td>Monton         Monton         Monton&lt;</td><td></td><td>Image: market set in the set in</td><td>Image: Section of the sectio</td><td></td><td></td><td></td><td></td><td></td><td>Image: market set of the set of</td><td></td><td></td><td></td><td></td><td></td></t<> | Control         < | Image: problem in the strategy of the s | Image: problem and | Image: problem and set of the se | Mathematical and state | Mathematical state         Mathema | Image: problem and | Image: problem and | Monton         Monton< |                             | Image: market set in the set in | Image: Section of the sectio |   |                                    |   |   |                          | Image: market set of the set of |                                      |   |                             |  |  |

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# Appendix B

# Water Supply Project Evaluation Criteria - Supply

Recommended COA Drought Response Decision Matrix SUPPLY MANAGEMENT

	Comments																																	
	Final	100%																																
	Risk of Alternative Supplies	10%	Dependence on Climatic Conditions (Variability of Yield) Hydrologic Storage- Potential Environmental Release																															
CT EVALUATION CRITERIA	Implementability	15%	notirqabA iteransid barupak notistingab binut inotistinganak inotistingab yunut iserangap yunut inotistingap yunut inotistingap yunut iseranga yunut iserang										X																					
ER SUPPLY PROJEC	Social Impacts	10%	nel'i nizuA anigemi bre ainonoo zaoneleß ritiw zbaqmi leinamnorikni zizeratni viinumoo noiseraa noiseraa										4	8																				
WATE	Environmental Impacts	20%	Aumer Fundamer Aumore Aumore Aumore Aumore Aumore Aumore Autore A																															
	Economic Impacts	20%	Unit Cost (S/Ara-F1) Unit Cost (S/Ara-F1) Treatment Need/Cost Energy Generation Energy Generation Interest																															
	Water Supply Benefit	25%	Polume Drought Restlence Drought Restlence Improved Relability and Listific Distring Supples Histific Distriction Drought Local Control (restlence) Local Control (restlence)																														20	
	(RA3)	<b>м/н</b>	стватебу улего (ас-				0																											
			COA Water Management Strategy Description	Augmentation of Supplies - (Supply Management)	System Operational Improvements (Existing Supplies)	Longhorn Dam Gate Operation	Reduced Lake Evaporation	Walter Long (Decker)Lake Off-Channel Storage	SAR Discharge Relocation above Austin Gauge	Lake Austin Varying Operating Level	Enhanced Operations (Additional Capital Reg'd)	Automate Longhorn Gates	Walter Long (Decker) Lake Off-Channel Storage	Capture Local Inflows to Lady Bird Lake	Aquifer Storage & Recovery (Edwards Aquifer)	Aquifer Storage & Recovery (Regional Non- Edwards Aquifer)	Indirect Potable Reuse - SAR to Lady Bird Lake	Barton Springs Capture & Augmentation	New Groundwater Supplies	Blue Water Systems* (Treat & Deliver)	Forestar <sup>a*</sup>	Northern Edwards Wellfield <sup>A*</sup>	Vista Ridge <sup>A*</sup>	Hays-Caldwell Public Utility Authority <sup>A*</sup>	Trinity Aquifer supplies	Other	Brackish desalination <sup>s*</sup>	Reclaimed water bank infiltration	Colorado Bed and Banks <sup>4</sup>	Rainwater harvesting	Commercial	Residential	ASR- Regional/Desalination	
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# Appendix E

Recommended Scoring System – COA Drought Response Decision Matrix

Requires Completion
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Drought Respo
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ded Scoring Sy
Recommen(

Category         Sub-Lategory           Supply Volume         Sub-Lategory           Supply Volume         Sup-Lategory           Supply Volume         Supply Volume           Criteria 1: Water Supply         Improved reliability and utilization of existing distribution           Benefit         Supplies           Criteria 2: Economic         Control (Resilience and Risk)           Diversification         Diversification           Diversification         Diversification           Impact         Energy Intensity           Impact         Energy Generation           Impacts         Energy Generation           Impacts         Manual Cost           Impacts         Manual Cost           Impacts         Intensity           Impacts         Energy on other Water Supplies           Impacts         Impact           Criteria 3: Environmental         Impact           Impacts         Mare Quality           Criteria 4: Social Impacts         Mare Guality           Implementability         Implementation           Criteria 5:         Recreation           Implementability         Political Opposition           Implementability         Political Opposition			Scoring System		
Supply Volume         Greatilience           Supply Volume         Greater Supply           Prought Resilience         Antilization of existing           Improved reliability and utilization of existing         W           Improved reliability with existing distribution         W           Systems         Local Control (Resilience and Risk)         W           Impact         Annual Cost         M           Inversification         Energy Intensity         Interact           Ipact         Energy Intensity         Inpacts on other Water Supplies         Interact           Iteria 2: Economic         Energy Intensity         Interact         Interact           Ipact         Energy Intensity         Interact         Interact         Interact           Iteria 3: Environmental         Interacts on other Water Supplies         Interact         Interact         Interact           Iteria 4: Social Impacts         Wetlands         Interests         Interests         Interests           Iteria 5:         Required External Adoption         Interests         Interests         Interests           Iteria 5:         Requisition         Energion         Interests         Interests         Interests           Iteria 5:         Requisition         Interests <td< th=""><th>Sub-Category -2</th><th>-1</th><th>0</th><th></th><th>1</th></td<>	Sub-Category -2	-1	0		1
riteria 1: Water Supply enefit the semilence of the stating distribution of existing distributio			Minimal ( <af)< td=""><td>2</td><td>1oderate (AF &lt; x <af)< td=""></af)<></td></af)<>	2	1oderate (AF < x <af)< td=""></af)<>
riteria 1: Water Supply enefit supply supplies supplies supplies supplies supplies supplies supplies and utilization of existing distribution systems call and the existing distribution systems control (Resilience and Risk) to biversification the earlier of the	Greatly reduced reliability during drought	Notable reduced reliability during drought	Neutral	Slį	ghtly reduced reliability during drought
Criteria 2: Economic     Quality compatibility with existing distribution systems       Diversification     Diversification       Diversification     Diversification       Criteria 2: Economic     Annual Cost       Energy Intensity     Energy Intensity       Energy Generation     Impact       Energy Generation     Impact       Energy Generation     Impact       Energy Generation     Impact       Inpacts     Impact Supplies       Inpacts     Impact       Criteria 3: Environmental     Energy Generation       Inpacts     Impact Supplies       Inpacts     Metlands       Criteria 4: Social Impacts     Metlands       Criteria 5:     Required External Adoption       Implementability     Political Opposition       Implementability     Political Opposition	WSP does not improve reliability and utilization of existing supplies	WSP extends existing supplies to serve more people	WSP extends existing supplies to serve more people	WSP ex to sel prot	tends existing supplies ve more people and ects Highland Lakes supply
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Criteria 3: Environmental Impacts     Instream Flow     Instream Flow       Impacts     Redargered/Threatened Species Impact     Impact       Wetlands     Wetlands     Wetlands       Water Quality     Imagine Austin Plan     Imagine Austin Plan       Criteria 4: Social Impacts     Wronmental impacts     Imagine Austin Plan       Criteria 5:     Reareston     Recreation     Imagine Austin Plan       Criteria 5:     Recreation     Imagine Austin Plan     Imagine Austin Plan       Criteria 5:     Recreation     Regulatory Approval     Imagine Austin Plan       Criteria 5:     Imagine Austin Plan     Imagine Austin Plan     Imagine Austin Plan	ther Water Supplies				
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Criteria 6. Bick of Dependence on Climatic Conditions	on Climatic Conditions				
Alternative Supplies repare	orage risk for potential environmental				

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