



Missouri Department of Natural Resources

AGENDA

Missouri Soil and Water Districts Commission

Telephone Conference Call

Lewis and Clark State Office Building

LaCharrette/Nightingale Conference Room

Jefferson City, MO

April 13, 2016

9:30 a.m.

A. CALL TO ORDER

B. MINUTES OF THE LAST MEETING

C. DEPARTMENT OF NATURAL RESOURCES

1. Nutrient Trading Overview

D. SOIL AND WATER CONSERVATION PROGRAM DIRECTOR'S COMMENTS

1. FY16 Cost-Share/AgNPS Fund Status
2. 2016 Area Meetings Update
3. FY16/FY17 Budget Updates
4. Natural Resources Damages Awarded Funding
5. State Water Plan Research Funding (Concurrence Requested)
6. U.S. Geological Survey Monitoring Network (Concurrence Requested)

E. REQUEST

(If a supervisor request is received in advance of this meeting, it may be presented to the commission.)

1. Johnson SWCD Supervisor Request
2. Callaway and Lewis SWCDs – N340 Cover Crop Practice Started Prior to Board Approval of Contract
3. Camden SWCD – Variance to the DSP 2 Permanent Vegetative Cover Enhancement Policy on Land Already in a Maintenance Agreement
4. Gasconade and Franklin SWCDs – Variance on the N340 Cover Crop Practice No-Till Requirement

F. APPEALS

G. NEW BUSINESS

H. REPORTS

1. NRCS
2. University of Missouri
3. Department of Conservation
4. Department of Agriculture
5. MASWCD

MISSOURI SOIL & WATER DISTRICTS COMMISSION

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I. PUBLIC COMMENTS

J. SUGGESTED DATE(S) OF NEXT MEETINGS

June 8, 2016 at 1:30 p.m., MDC Central Regional Office, Gans Road, Columbia MO

K. ADJOURNMENT

Those wishing to address the commission on any of the above issues need to contact a program staff member, Theresa Mueller or sign up on the comment card at the commission meeting.

If you have any questions regarding this meeting, special accommodation needs, or would like a copy of any material provided at the commission meeting, please contact Theresa Mueller at 573-526-4662.

The Soil and Water Districts Commission may go into closed session at this meeting if such action is approved by a majority vote of the commission members who constitute a quorum to discuss legal, confidential, or privileged matters under § 610.021(1), RSMo 2000; personnel actions under §610.021(3); personnel records or applications under §610.021(13), records under § 610.021(14), or audit issues under § 610.021(17), which are otherwise protected from disclosure by law.



Missouri Department of Natural Resources

MINUTES

MISSOURI SOIL AND WATER DISTRICTS COMMISSION

TELEPHONE CONFERENCE CALL

Lewis and Clark State Office Building

Jefferson City, Missouri

February 10, 2016

COMMISSION MEMBERS VIA TELEPHONE: Charles Ausfahl, H. Ralph Gaw, Jeff Lance and Gary Vandiver

EX-OFFICIO MEMBERS VIA TELEPHONE: RICHARD FORDYCE, DEPT. OF AGRICULTURE: Judy Grundler; BOB ZIEHMER, DEPT. OF CONSERVATION: Lisa Potter; DEAN THOMAS PAYNE, UNIV. OF MISSOURI: Robert Kallenbach

EX-OFFICIO MEMBERS: SARA PARKER PAULEY, DEPT. OF NATURAL RESOURCES: Joe Engeln

ADVISORY MEMBERS VIA TELEPHONE: NATURAL RESOURCES CONSERVATION SERVICE (NRCS): J. R. Flores; MISSOURI ASSOCIATION OF SOIL AND WATER CONSERVATION DISTRICTS (MASWCD): Kenny Lovelace

ADVISORY MEMBERS VIA TELEPHONE: ATTORNEY GENERAL'S OFFICE: Tim Duggan

ADVISORY MEMBERS PRESENT: SOIL AND WATER CONSERVATION PROGRAM: Colleen Meredith

STAFF MEMBERS PRESENT: Van Beydler, Jim Boschert, April Brandt, Theresa Mueller, Jim Plassmeyer, Colette Weckenborg, Bill Wilson, Jake Wilson

OTHERS PRESENT VIA TELEPHONE: HOWARD: Beverly Dometrorch; JEFFERSON: George Engelbach; MISSOURI SOIL AND WATER CONSERVATION DISTRICT EMPLOYEES ASSOCIATION (MSWCDEA): Sandy Stratman; MISSOURI COALITION FOR THE ENVIRONMENT: Heather Navarro

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A. CALL TO ORDER

The meeting was called to order at the Lewis and Clark State Office Building, in Jefferson City, MO, in the LaCharrette Conference Room at 10:38 a.m.

Roll call was taken and the following commissioners were present via the telephone: Charles Ausfahl, H. Ralph Gaw, Jeff Lance and Gary Vandiver, which made a quorum.

Chairman Vandiver informed the Commission that Tim Martin was not confirmed by the Senate; therefore, he is no longer on the Commission.

B. MINUTES OF THE LAST MEETING

Jeff Lance made a motion to approve the minutes for the December 1, 2015, meeting. H. Ralph Gaw seconded the motion. When polled, Charles Ausfahl, H. Ralph Gaw, Jeff Lance and Gary Vandiver voted in favor of the motion and the motion carried unanimously.

C. DEPARTMENT OF NATURAL RESOURCES

1. Election of Commission Chair and Vice-Chair

Joe Engeln opened the floor for nominations for the positions of Chair and Vice-Chair. Charles Ausfahl made a motion to re-elect the Chairman Gary Vandiver and Vice-Chairman Ralph Gaw by acclamation. Jeff Lance seconded the motion. When polled, Charles Ausfahl, H. Ralph Gaw, Jeff Lance and Gary Vandiver voted in favor of the motion and the motion carried unanimously.

2. Department of Natural Resources Updates

Joe Engeln reported the department was continuing their efforts on the Regional Conservation Partnership Program and they plan to announce some additional watersheds as they move forward with Our Missouri Waters.

At the next Commission meeting, Mr. Engeln plans to provide information on nutrient and/or water quality trading in Missouri. Since last July stakeholders have been working on this topic with participation from communities and agriculture. He stated they are on schedule to meet their goal of presenting the draft framework to the public in June. The framework is the policy background that provides a base for nutrient trading. They would like to have the public meeting tied to the Clean Water Commission meeting in July, and then three months later at their October meeting approve it as their framework.

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He updated the Commission on the department's continued work on E3 (Enhancing Effectiveness and Efficiency). He also provided information on the Gulf Hypoxia Task Force meeting that will be held in St. Louis on April 25-27.

D. SOIL AND WATER CONSERVATION PROGRAM DIRECTOR'S COMMENTS

Colleen Meredith thanked everyone who was able to participate in the telephone conference call and for all their hard work.

1. FY16 Cost-Share/AgNPS Fund Status

April Brandt presented the Fiscal Year (FY) 2016 Regular Cost-Share and Agricultural Nonpoint Source (AgNPS) Special Area Land Treatment (SALT) Fund Status report. She stated that as of February 3, 2016, \$43.6 million had been allocated and of that amount, \$30 million had been obligated. The total amount paid was approximately \$13.4 million. As of February 3, 2016, \$110,000 of the SALT Cost-Share had been allocated and of that amount, \$50,610 had been obligated. The total amount paid was approximately \$38,260.

Next, she covered the FY16 supplemental allocation. As of February 3, 2016, approximately \$15.7 million has been provided to the districts that qualified. There have been a total of seven supplemental allocations between August 6, 2015 and February 4, 2016, for a total of \$17 million this year for supplemental allocations. There were 102 districts that received allocations.

2. Plan for the Future Update

Jim Plassmeyer presented an update on the Current Conservation Practices Subcommittee. At the Commission's request, one of the items the committee discussed was the Grazing School issue that was brought before the Commission by Dade SWCD at the December Commission meeting. The group worked on a plan on how to proceed with concerns that were raised. He stated there would be more information at the next Commission meeting. The Commission also wanted the group to look at the issue of starting a practice prior to board approval. He reminded everyone that there were appeals at the last Commission meeting regarding this issue. After discussion, the group decided to continue with the policies that were already in place. He stated there is another request from Shannon SWCD regarding an animal waste storage facility for small ruminants. The committee discussed this issue as well and will bring it to the Commission for their response to the request. Another item discussed was consolidating pipe components for terraces. The committee was interested in the idea and will get more information from other districts. This information will be presented to the Commission for their consideration. The committee also discussed the practice policy reviews. He thanked everyone who participated in this committee meeting.

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3. **District Specialist Testing**

Bill Wilson presented an update on the District Specialist testing. There have been three testing sessions; since November 30, 2015, 74 district staff have taken the tests and 61 have passed at least four of the seven tests for the progression. There are additional training sessions planned for other regional locations.

4. **Update on the Program Delivery and Operations Subcommittee**

Colette Weckenborg presented an update on the Program Delivery and Operations Subcommittee. The progression line developed by the subcommittee received Commission concurrence and was implemented on January 1, 2016. As of the January 1st allocations, there are 122 District Specialist (DS) Is, 34 DS IIs, 67 DS IIIs and 46 DS IVs.

5. **2016 Area Meetings Update**

Bill Wilson presented an update on the 2016 Area Meetings schedule. The meetings are scheduled for the week of March 28, 2016. A meeting is scheduled in each of the eight Missouri Association of Soil and Water Conservation District areas.

6. **Soil Health Assessment Center Update**

Colleen Meredith presented an update on the Soil Health Assessment Center (SHAC). She stated the University of Missouri aims for high quality, strong quality assurance quality control and to be relevant to Missouri. The lab has received 1,870 samples. She pointed out that does not mean there are 1,870 contracts; there could be multiple samples per contract. The SHAC is working on a data base for comparative uses for the samples and it will be on a regional basis, as well statewide. They are working on using the soil survey information with this database. About 25-30 percent of the samples received did not have adequate soil information needed, which will be worked on with the districts. She presented a list of what each of the soil health packages covered, as well as the cost for each. She stated the analytical assessments of soil health is relatively new and need fundamental calibration compared to traditional soil fertility and nutrient testing. The SHAC is developing the data base and baseline for association with soil mapping units for the data development. There is a need for whole soil profile landscape assessment.

Next, she covered the lab renovation that was taking place. The lab, office/sample storage, sample preparation area and breezeway are completed; now they are working on the training room.

7. **FY16/FY17 Budget Updates**

Colette Weckenborg presented an update on the FY16/FY17 Budget. She reminded the Commission that for this time of year the obligations for cost-share exceed last year's obligations. Because of this, the program has submitted a

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request for supplemental funding for the current fiscal year in the amount of \$4 million for cost-share. This would bring the appropriation authority to \$35 million for this year. She stated this was being considered through the legislative process. The FY17 budget is in process also; both the House and the Senate appropriation committees have heard the initial readings of the Governor's Recommended Budget. She pointed out there is a new decision item for cost-share in the amount of \$3.8 million, as well as a redirect of \$200,000 from SALT to cost-share. There is also an additional \$5 million recommendation from the Governor for cost-share in FY17, which brings the total for FY17 cost-share to \$40 million. She pointed out that the new decision item request of \$3 million for District Grants to support the Plan for the Future did not get recommended by the Governor.

E. REQUEST

1. **Reconstruction of Practices under Maintenance That Were Damaged From Recent Storm Events: Cape Girardeau SWCD, Lawrence SWCD, McDonald SWCD, Miller SWCD, Newton SWCD, Reynolds SWCD, Ste. Genevieve SWCD, Wayne SWCD**

Jim Boschert presented a request for reconstruction of practices under maintenance that were damaged from recent storm events in the following counties: Cape Girardeau, Lawrence, McDonald, Miller, Newton, Reynolds, Ste. Genevieve and Wayne. The storm events occurred in late December resulting in heavy storms and flooding. There were two Federal Emergency Management Agency declarations; one dated January 2 and the other January 21, 2016 that mainly referred to grants for homeowners. There were 74 counties in Missouri that were included in the Federal Emergency Management Agency (FEMA) 3374-EM Missouri Disaster Declaration as of January 4, 2016.

Mr. Boschert stated there were three issues for the Commission to consider. All three issues are for the 74 counties under FEMA-3374-EM. The first issue; should the Commission give blanket approval for reconstruction of soil and water conservation practices currently under a maintenance agreement that were damaged from severe storms, tornadoes, straight-line winds, and flooding beginning on December 22, 2015. The second issue should the Commission allow the landowners who have already repaired the damage to their practices under maintenance to receive cost-share provided they have appropriate documentation and the third issues should the Commission allow the landowners cost-share for reconstruction of fence for WQ10 Stream Protection and N472 Livestock Exclusion. Next, Commission policies were covered, as well as pictures that the districts submitted of the damaged practices. He stated the Soil and Water Conservation Program was proposing reconstruction of fencing at 50 percent cost-share instead of 75 percent because in most cases the materials are there and just

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need to be reinstalled/repared. Grouped components are suggested to be broken into their individual components to only pay on items that were damaged.

After discussion, H. Ralph Gaw made a motion to allow the 74 counties in the FEMA-3374-EM Missouri Disaster Declaration as of 01/04/16 approval to use their cost-share allocation to rebuild practices still under maintenance that were damaged, limiting reconstruction on fence to 50 percent. District can use their FY16 or FY17 cost-share allocation by the deadline date of December 31, 2016. Jeff Lance seconded the motion. When polled, Charles Ausfahl, H. Ralph Gaw, Jeff Lance and Gary Vandiver voted in favor of the motion and the motion carried unanimously.

Jeff Lance made a motion to allow the landowners in the 74 counties in the FEMA-3374-EM Missouri Disaster Declaration who have already repaired the damage to their practices under maintenance to receive cost-share provided they have appropriate documentation. H. Ralph Gaw seconded the motion. When polled, Charles Ausfahl, H. Ralph Gaw, Jeff Lance and Gary Vandiver voted in favor of the motion and the motion carried unanimously.

After discussion, H. Ralph Gaw made a motion to allow the 74 counties in the FEMA-3374-EM Missouri Disaster Declaration cost-share for reconstruction of fence for WQ10 Stream Protection and N472 Livestock Exclusion. Jeff Lance seconded the motion. When polled, Charles Ausfahl, H. Ralph Gaw, Jeff Lance and Gary Vandiver voted in favor of the motion and the motion carried unanimously.

F. REPORTS

1. Department of Agriculture

Judy Grundler reported Dave Baker is working with them on the Agriculture Stewardship Assurance Program, as well as with pesticide applicator training. He is updating their training modules for the pesticide applicators. She stated the Department of Agriculture submitted comments to Environmental Protection Agency regarding changes to both the private and commercial applicator licenses.

She stated there will be training in their Feed Program to ensure their Feed Manufacturing Firms are prepared to deal with the Food Safety Modernization Act. She pointed out they are working on getting their feed lab accredited also.

Robert Kallenbach added that University Extension had a stakeholder meeting regarding the proposed regulations for pesticide applicators. They believe the training for this is going to be a challenge. Ms. Grundler stated they are also working on revamping their commercial applicator testing methods.

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2. **Natural Resources Conservation Service**

J. R. Flores reported the Conservation Stewardship Program has \$150 million available nationwide; last year in Missouri there were 118,000 acres enrolled and this year Missouri has been allocated 264,000 acres. The Environmental Quality Incentive Program (EQIP) has over 500 applications preapproved and are expecting over 1,000 by the end of the year. Missouri was selected to be a Strikeforce State; this is where USDA agencies identify ways to leverage partner activities in order to bring economic opportunities to people in rural areas. He stated the agency has been allocated additional funds for this effort through EQIP. The Emergency Watershed Protection Program was discussed at three public meetings around the state. Some of the typical projects for this program are debris and sediment removal from streams, levee repairs and streambank stabilization. He reported there have been 20 requests for a total of \$10 million. He reported their Service Center in Barry County flooded and since this was the second time in three years that it flooded the building, they are looking for another location. The Wetland Mitigation Banking Program was announced. It is made possible by the 2014 Farm Bill and assists farmers and ranchers when they need to mitigate acres in order to make their operations effective.

3. **University of Missouri**

Dr. Robert Kallenbach reported they will continue to work on the Grazing School based on the Current Conservation Practices Subcommittee discussions. They have had Lending Schools to train bankers about agriculture. It has been an effective program for the farming communities. They have also spent time on flood responses over the last month helping people to deal with specific situations from a regional perspective. They are working on new curriculums at the University for the following: Hay School that was piloted and now being put together for statewide use; Wealth Transfer regarding the transfer of farm ownership from one generation to another; as well as Commercial Horticulture. He informed the Commission they are working on a meeting to discuss commercial agriculture in the state.

4. **Department of Conservation**

Lisa Potter presented an update on Chronic Wasting Disease; there were new findings in Cole and Franklin counties and they are now conducting intensive sampling in those counties. As of the date of the Commission meeting, there have been 6,700 samples collected and the results are pending on 1,600 of them.

She stated the Monarch Steering Committee is comprised of representatives from almost all state and federal agencies, commodities groups, private industries and non-governmental organizations. The Department of Conservation is about to finalize the process of hiring a Coordinator to help them write and finalize the State Monarch Action Plan. They are also working on hiring a State Monarch and Pollinator Coordinator.

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5. Missouri Association of Soil and Water Conservation Districts

Kenny Lovelace informed the Commission that on February 17, in Jefferson City at 10:00 a.m., they will have a State Board Meeting with an Educational Seminar in the evening, and invited everyone to attend.

He thanked everyone who helped at Tan-Tar-A to make the Training Conference a success.

G. ADJOURNMENT

Charles Ausfahl made a motion to adjourn the meeting. H. Ralph Gaw seconded the motion. When polled, Charles Ausfahl, H. Ralph Gaw, Jeff Lance and Gary Vandiver voted in favor of the motion and the motion carried unanimously. The meeting was adjourned at 12:21 p.m.

Respectfully submitted,

Colleen Meredith, Director
Soil and Water Conservation Program

Approved by:

Gary Vandiver, Chairman
Missouri Soil and Water Districts Commission

/tm

Master Fund Status Summary

District	Allocated	Obligated	%Obligated	# Contracts	Contract Payment	% Contract Payment	# Contract Payments	Pending
FY: 2016 Fund Code:R Project:AWM - ANIMAL WASTE MANAGEMENT	\$2,301,610.00	\$1,338,396.09	58.15%	65	\$768,571.85	33.39%	33	\$93,283.26
FY: 2016 Fund Code:R Project:CCC - CHARITON PILOT COVER CROP	\$35,000.00	\$21,097.50	60.28%	9	\$0.00	0.00%	0	\$0.00
FY: 2016 Fund Code:R Project:GM - GRAZING MANAGEMENT	\$6,530,393.56	\$4,262,867.41	65.28%	1254	\$1,905,840.47	29.18%	583	\$159,094.37
FY: 2016 Fund Code:R Project:IM - IRRIGATION MANAGEMENT	\$1,847,801.94	\$1,392,569.91	75.36%	242	\$836,477.18	45.27%	143	\$31,827.49
FY: 2016 Fund Code:R Project:NP - NUTRIENT & PEST MANAGEMENT	\$1,124,745.00	\$560,125.10	49.80%	666	\$534,329.70	47.51%	644	\$0.00
FY: 2016 Fund Code:R Project:SA - SENSITIVE AREAS	\$3,687,131.20	\$1,920,531.17	52.09%	381	\$841,208.28	22.81%	181	\$99,444.85
FY: 2016 Fund Code:R Project:SGE - SHEET AND RILL / GULLY EROSION	\$27,215,749.34	\$23,716,742.95	87.14%	4718	\$11,787,885.92	43.31%	1939	\$510,562.07
FY: 2016 Fund Code:R Project:WE - WOODLAND EROSION	\$2,147,522.72	\$867,917.25	40.41%	294	\$311,435.63	14.50%	113	\$26,947.69
Subtotal for R	\$44,889,953.76	\$34,080,247.38	75.92%	7629	\$16,985,749.03	37.84%	3636	\$921,159.73
FY: 2016 Fund Code:SN Project:BDSP-31 - BUFFER SINKHOLE IMP	\$24,300.00	\$0.00	0.00%	0	\$0.00	0.00%	0	\$0.00
FY: 2016 Fund Code:SN Project:NRDSE - NRD SOUTHEAST	\$5,000.00	\$0.00	0.00%	0	\$0.00	0.00%	0	\$0.00
FY: 2016 Fund Code:SN Project:NRDSW - NRD SOUTHWEST								

Master Fund Status Summary

District	Allocated	Obligated	%Obligated	# Contracts	Contract Payment	% Contract Payment	# Contract Payments	Pending
	\$55,245.83	\$0.00	0.00%	3	\$0.00	0.00%	0	\$51,245.83
FY: 2016 Fund Code:SN Project:SN093 - HURRICANE CREEK AND LITTLE WHITEWATER								
	\$6,066.52	\$6,066.52	100.00%	1	\$6,066.52	100.00%	1	\$0.00
FY: 2016 Fund Code:SN Project:SN095 - UPPER BIG CREEK								
	\$2,809.22	\$2,809.22	100.00%	2	\$0.00	0.00%	0	\$0.00
FY: 2016 Fund Code:SN Project:SN096 - CROWLEY'S RIDGE								
	\$12,308.28	\$7,281.20	59.16%	1	\$7,281.20	59.16%	1	\$0.00
FY: 2016 Fund Code:SN Project:SN098 - WARM FORK OF SPRING RIVER								
	\$40,000.00	\$9,541.43	23.85%	2	\$0.00	0.00%	0	\$0.00
FY: 2016 Fund Code:SN Project:SN099 - HEATHS CREEK								
	\$14,912.00	\$14,912.00	100.00%	1	\$14,912.00	100.00%	1	\$0.00
FY: 2016 Fund Code:SN Project:SN102 - SOUTH WYACONDA								
	\$10,000.00	\$10,000.00	100.00%	1	\$10,000.00	100.00%	1	\$0.00
Subtotal for SN	\$170,641.85	\$50,610.37	29.66%	11	\$38,259.72	22.42%	4	\$51,245.83

Master Fund Status Summary

Master Fund Status Summary (2016)

Subtotal for R	\$44,889,953.76	\$34,080,247.38	75.92%	7629	\$16,985,749.03	37.84%	3636	\$921,159.73
Subtotal for SN	\$170,641.85	\$50,610.37	29.66%	11	\$38,259.72	22.42%	4	\$51,245.83
Report Totals	\$45,060,595.61	\$34,130,857.75	75.74%	7640	\$17,024,008.75	37.78%	3640	\$972,405.56

Missouri Water Plan WORKPLAN OUTLINE



March 12, 2015





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Section 1 Task Options



The Missouri Department of Natural Resources (MDNR) is charged with preparing, maintaining and implementing the Missouri State Water Plan per state statute 640.415 RSMo. Missouri has been successfully implementing this plan through studies and projects focused primarily on meeting the water supply challenges of the state. Missouri's water resources are vital to the health and economy of the state. As such, it is important to maintain a current, comprehensive and contemporary plan for the management of the Missouri's water resources.

Looking at regions of the state, key elements for Missouri's next iteration of the State Water Plan involve analyzing water demands and defining water supply and availability. Apparent gaps between demand and supply will be determined and priorities for infrastructure funding will be defined. Effective public outreach and stakeholder involvement are integral to the State Water Plan process to garner public input and support as well as constituent buy-in for future infrastructure funding. Public participation is required per state statute 640.415 RSMo during development and revision of the State Water Plan.

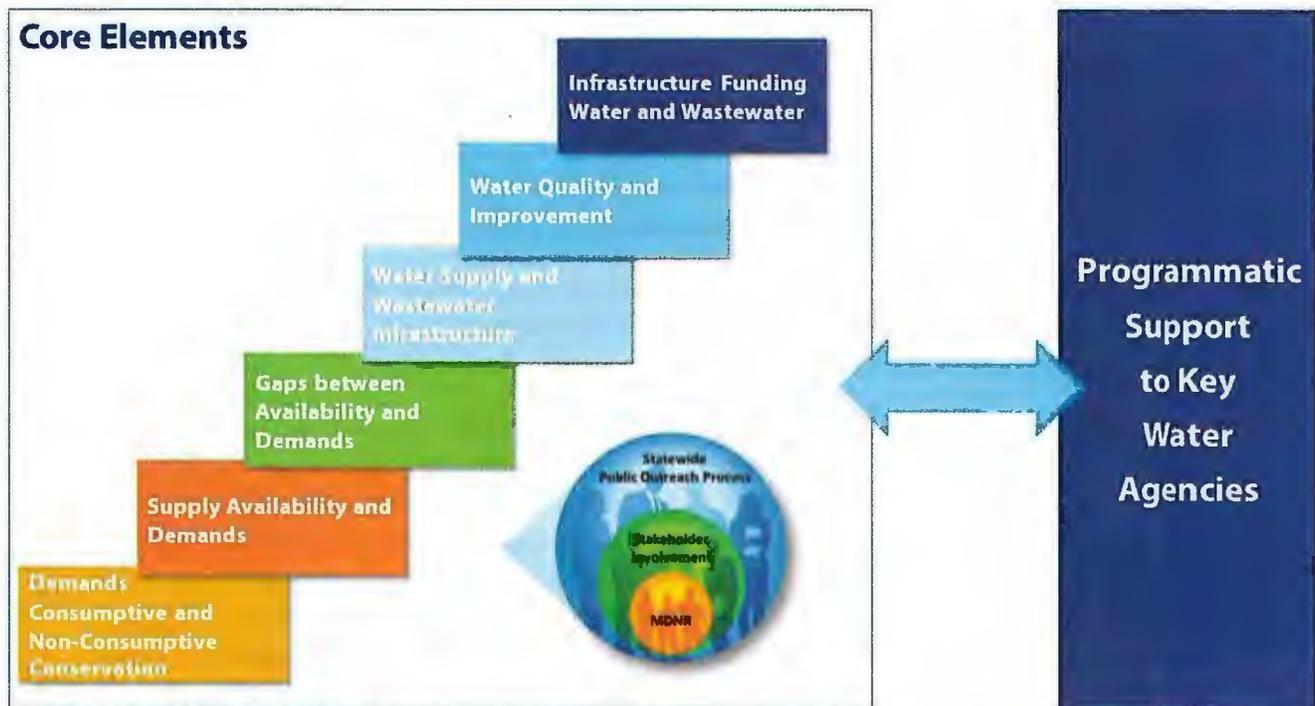


Figure 1. Core Elements of a State Water Plan

Likewise, several state agencies are appointed through the Inter-Agency Task Force (IATF) as established in state statute 640.430 RSMo, to advise the MDNR during the development and revision of the State Water Plan.

The update to the State Water Plan will set the vision for the water resources management of the state that will benefit present and future generations. It has been more than a decade since the last edition of the plan. This outline includes three options for consideration that reflect varying levels of effort and engagement that will address the core elements while meeting state regulations or state requirements. Each option builds upon the previous, allowing flexibility in the process to meet the immediate as well as future needs. The options offered reflect an 18-, 24-, and 36-month schedule for completion. A final report will be provided at the end of 18 months including infrastructure, policy and future study recommendations.

Option 1 (18 months). A team of MDNR staff and CDM Smith will be working closely with stakeholders to complete the State Water Plan update within 18 months. The plan will leverage available data and studies including the northwest and southwest Missouri demand and supply availability data and findings as well as the surface water yield Reservoir Operation Study Computer Program (RESOP) studies. Public outreach and education will leverage the ongoing watershed planning efforts of *Our Missouri Waters (OMW)* by reaching out to basin stakeholders. Citizens of Missouri have expertise on issues related to their local water resources. Involving this expertise during the planning process is essential for sound water policy to meet the needs for future generations. The stakeholder engagement in this process occurs at the earliest phases to ensure that citizen-experts' concerns, ideas for solutions and priorities are incorporated throughout the planning process.

There is no additional groundwater or hydrologic and hydraulic modeling anticipated in this option. Nor will there be decision support models, tools and respective training provided in this 18-month period. CDM Smith will be in close coordination with MDNR staff in identifying data and studies in support of a rapid planning process to provide agreed upon water resource management recommendations.

Pro: Comprehensive planning including core elements, completed quickly with available data and studies, methods, approaches and recommendations vetted with MDNR staff and best professional judgment, and engagement with partner agencies for input and buy in.

Option 2 (24 months). A team of MDNR staff and CDM Smith will be working closely with stakeholders to complete the State Water Plan update within 24 months. The plan will build upon the available data, studies and projects from across the state. An evaluation of available data will be conducted in conjunction with *OMW* to determine gaps that will lend to identifying data needs which may require data collection, surveys and possible modeling to support the plan. Stakeholder involvement in forming the technical work groups will be incorporated into the process to review methods, approaches and recommendations. In addition to the education and outreach achieved by *OMW* that is targeted at a basin scale, the plan will educate and engage residents and business statewide.

Pro: Inclusive of all components of Option 1. Additional elements include stream data, vetted with stakeholder-based technical work groups, and greater public education and input.

Option 3 (36 months). A team of MDNR staff and CDM Smith will be working closely with stakeholders to complete the State Water Plan update within 36 months. The plan will employ contemporary tools such as a decision support model in identifying priorities, phasing and funding. These decision support tools such as IWR-MAIN and STELLA will remain with MDNR and necessary training will be provided for future decision

making. The three-year process will kickoff with public outreach regarding the current plan and future plan needs by region. Stakeholder-based technical work groups will work on the core elements that support methods, approaches, findings and recommendations. Decision support models will assist in final recommendations and costs. Draft findings will be vetted through a series of statewide meetings.

Pro: Inclusive of all components of Options 1 and 2. Additional components include employment of tools applied for topics such as minimum/instream flows, fits the timeline of the *OMW* in its delivery, educates the public/constituents for support of future infrastructure needs.

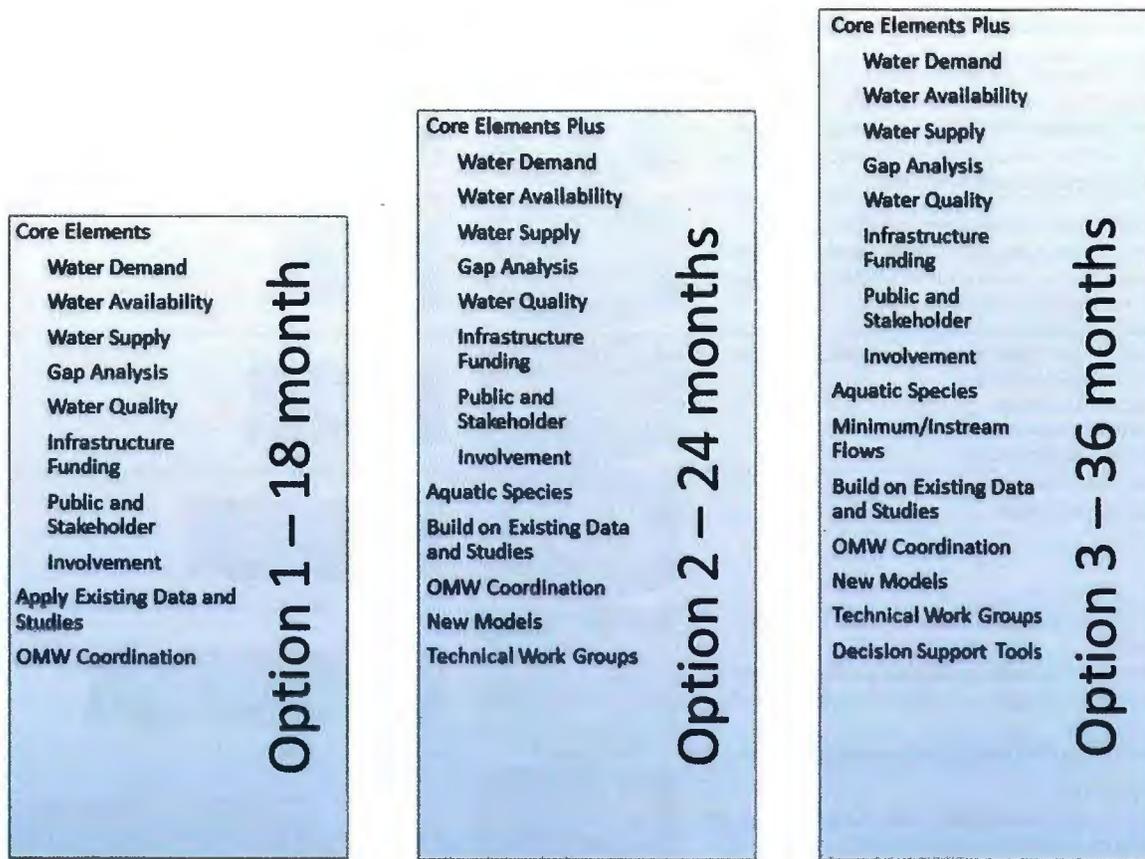
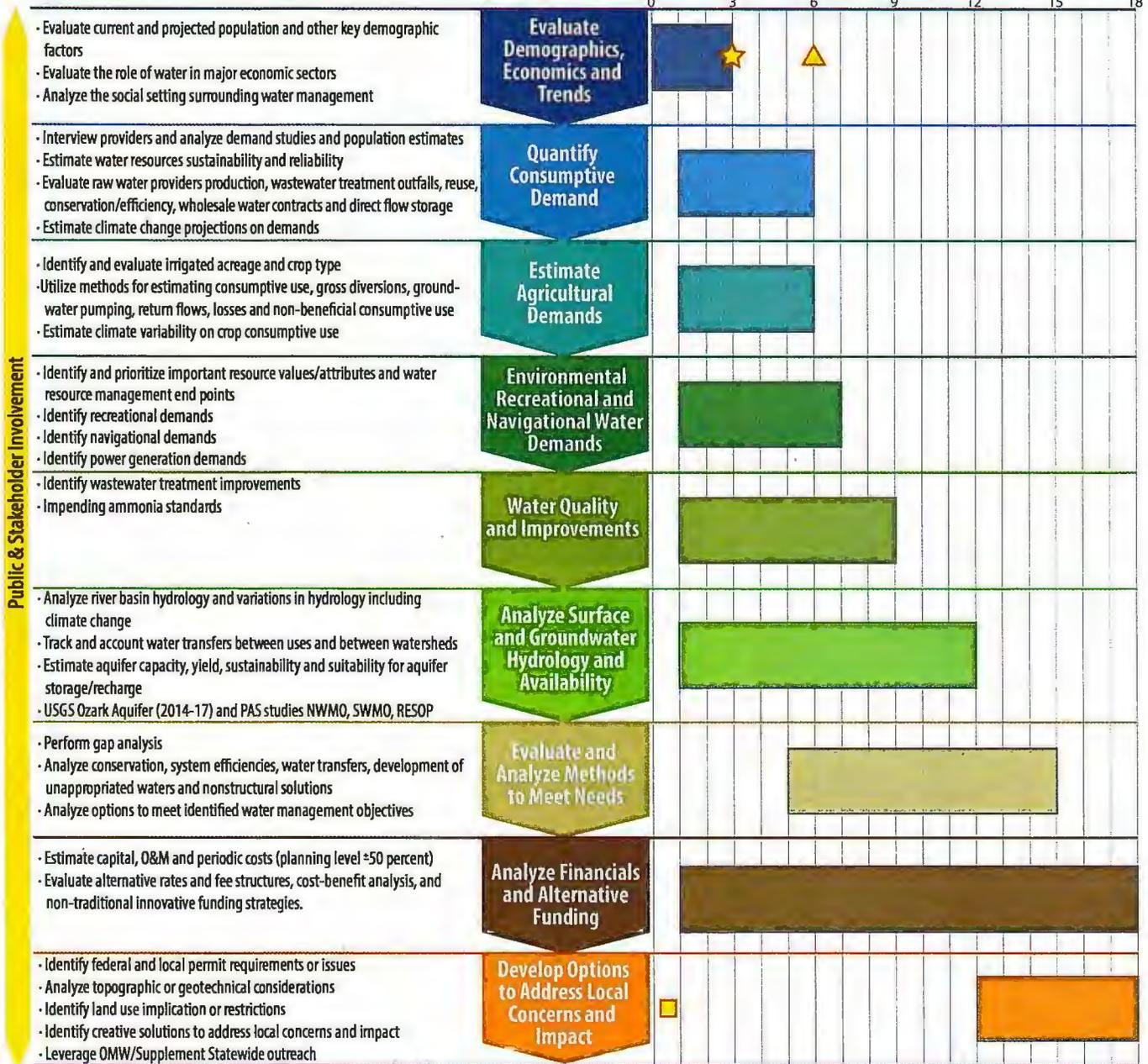


Figure 2. Summary of Each Major Task for the 3 Options

Section 2 Tasks and Timeline



TASKS AND TIMELINE: OPTION 1

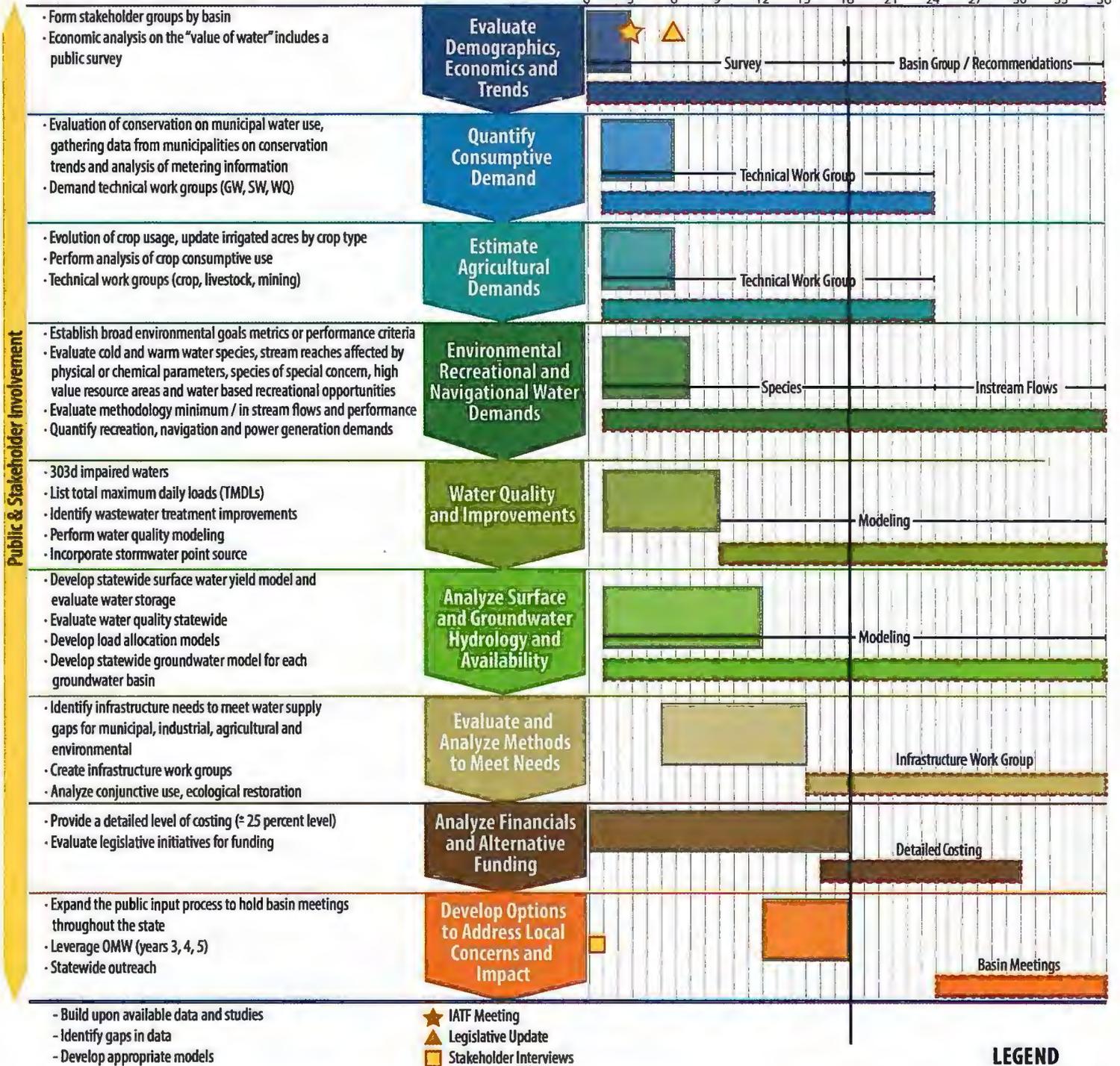


Public & Stakeholder Involvement

- Applying available data and studies
- No new H&H or groundwater modeling
- No Decision Support model/tool
- ★ IATF Meeting
- ▲ Legislative Update
- Stakeholder Interviews

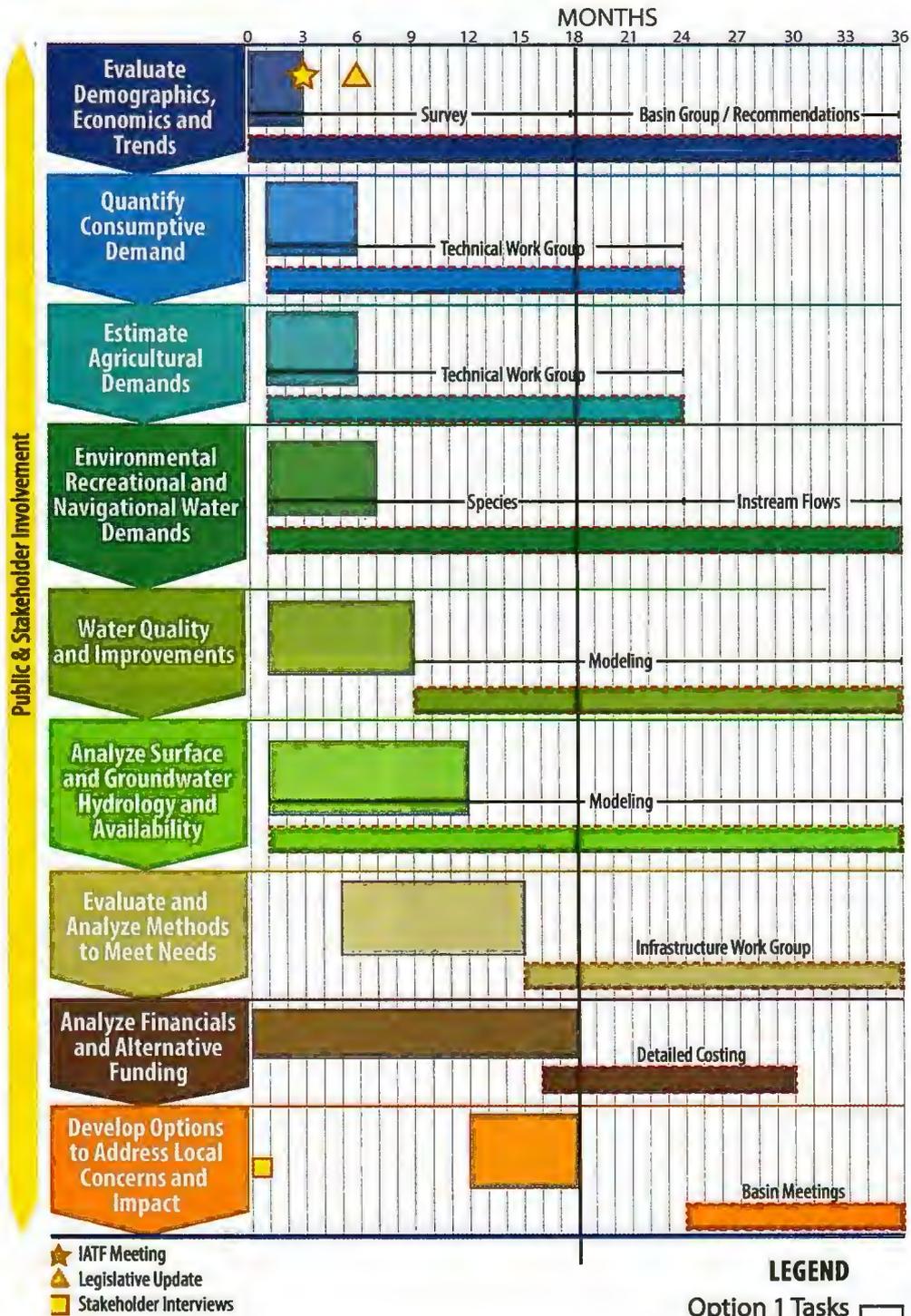
Missouri Water Plan

TASKS AND TIMELINE: OPTIONS 2 AND 3



Missouri Water Plan

TASKS AND TIMELINE: OPTIONS 1, 2 AND 3



Section 3 Task Descriptions and Assumptions



Public & Stakeholder Involvement

Evaluate Demographics, Economics and Trends

The overall objective for all tasks will be to develop a common technical platform for the state. A common technical platform will be useful for building consensus and comparing needs across the state. All tasks will be executed at the designated planning level for the state, i.e., five planning regions.

Quantify Consumptive Demand

Assumptions:

Option 1:

- Planning horizon will be 2060 for the State Water Plan.
- Planning regions will mirror the five planning regions from the previous State Water Plan.
- Region descriptions and institutional setting (e.g., mission, mandates, laws and policies) will be migrated forward from the previous State Water Plan.

Estimate Agricultural Demands

Environmental Recreational and Navigational Water Demands

Options 2/3:

- The scope of the effort will be expanded particularly in the areas of demand projection, groundwater availability, infrastructure and stakeholder involvement.
- Planning regions may be defined differently (e.g., based on watersheds) or expanded beyond the five planning regions from the previous State Water Plan.
- Basin descriptions and institutional setting will be revised to include information that represent changed conditions with respect to water management in 2015.

Water Quality and Improvements

Analyze Surface and Groundwater Hydrology and Availability

Task 1 Evaluate Demographics, Economics and Trends

Evaluate and Analyze Methods to Meet Needs

The evaluation of economic, demographic and social trends for a region begin with a clear understanding of what issues, questions and objectives the state is seeking to answer with these data. There will be a consideration of past, current and future growth projections; both economic and population. These are drivers of sector water demand projections.

Analyze Financials and Alternative Funding

Assumptions:

Option 1:

- The Missouri Census Data Center and the Office of Administration's state demographer will provide population projections to 2030. MDNR will extrapolate population projections to 2060 as were completed for southwest Missouri.

Develop Options to Address Local Concerns and Impact

Options 2/3:

- The state demographer will provide population projections to 2030. CDM Smith will extrapolate population projections to 2060 at the county level. These projections will be available by county.

Task 2 Quantify Consumptive Demands

Water use data must be gathered from available sources including MDNR's Major Water User database, U.S. Geological Survey (USGS) reports, and the Public Water Supply Census. Several methodologies will be looked at to determine municipal and industrial demands. Gallons per capita or projections by sector applying employment will depend upon the available data and purpose. Stakeholders may contribute in support of methods applied and accepting the findings.

Assumptions:

Option 1:

- County-wide gallons per capita per day (gpcd) will be established based upon the Public Water Supply (PWS) Census production values and population served. Self-supplied residential will be based upon population by county minus PWS population served multiplied by per capita water use. Self-supplied nonresidential water use will be obtained from MDNR's Major Water User database and USGS reports.

Options 2/3:

- County-wide gallons per capita per day (gpcd) will be established as data are available from water providers. An extensive analysis of conservation savings will be performed.
- Demand projections for each of the water use sectors defined in the MDNR's 1994 Water Use in Missouri report will be completed on a county basis.

Task 3 Estimate Agricultural Demands

Agricultural demands consist primarily of crop irrigation, livestock watering and aquaculture. Acres by crop type and number of livestock are readily available in the USDA's Census of Agricultural data. Future projections of the mix of crop type, head of livestock, and water use by type are the key drivers in determining agricultural demands. Understanding the latest practices and technologies are key when making these determinations.

Assumptions:

Option 1:

- Irrigated acres by crop type, livestock and aquaculture counts are available from USDA's Census of Agriculture. USGS Water Use reports along with University of Missouri Extension data can be used to estimate water use per head and irrigated acre by crop type, respectively. Projections for agriculture use would be based on historic trends.

Options 2/3:

- Agriculture acres by crop type are available, an analysis of crop consumptive use is performed including climate variability impacts on crop consumptive use.
- Stakeholders from each agricultural demand sector may contribute in support of methods applied and accepting the findings.

Task 4 Environmental, Recreational and Navigational Water Demands

Non-consumptive water demands are considered recreational, navigational, environmental and power utilities. These demand sectors are important economic drivers in Missouri. The State Water Plan would set priorities and balance the impacts of future consumptive demands with the non-consumptive demands. The State Water Plan would set future study of flows required for recreation, navigation and the environment. Power generation, both hydropower and thermal, are also large users of water for turbine generation and cooling water. User groups are essential to understanding and balancing these demands.

Assumptions:

Option 1:

- Demands for non-consumptive use will be projected at the same use as today. For example, thermal power projections based upon the Department of Energy's Energy Information Agency's projections by fuel type for reference, high, low may be applied for demand estimates.
- Environmental and recreational demands will be identified.

Options 2/3:

- Environmental attributes will be identified by stakeholders in each planning area. These attributes can be used to determine environmental priorities for flows and project priorities. A methodology and tools for developing in-stream flows will be established.

Task 5 Water Quality and Improvements

Water quality is critical to the health and economy of Missouri for current and future generations. Water quality is important for potable water, end of the pipe wastewater, and stormwater discharges. Water quality plays a vital part of the biological integrity and diversity of the state's water systems and as such contributes greatly to recreational opportunities. There are existing regulatory programs and processes for waterways that are included on the 303d list or those that have an approved total maximum daily loads (TMDLs) that work outside the State Water Plan. The plan process will assist in identifying water quality needs associated with ammonia.

Assumptions:

Option 1:

- Water and wastewater treatment facility information is available from the MDNR's violations database and the Missouri Clean Water Information System (MoCWIS).
- Water quality improvements with respect to ammonia will be identified.

Option 2/3:

- Include 303d lists and TMDL information to inform the decision making process.
- Nonpoint Source, watershed restoration projects and monitoring data is available; in coordination with *OMW*.
- Water quality needs will be expanded beyond ammonia to include nutrients.
- Water quality modeling will be performed to evaluate assimilative capacity and wastewater upgrades.

- Groundwater quality data will be available from MDNR's groundwater monitoring network and USGS.

Task 6 Analyze Surface and Groundwater Hydrology and Availability

Evaluation of surface and groundwater sources may include collection of data from a variety of sources including the state, USGS and the U.S. Army Corps of Engineers (USACE). The state has completed stream and reservoir firm yield studies for at risk water supplies in Missouri. The studies examine the drought of record firm yields and are published in the Missouri Water Supply Study (RESOP), June 2011.

The state may find that additional water availability analyses are required to support decision-making related to the water supplies to serve projected water needs. As the state continues to focus on potential gaps in water supply for future demands and potential means to serve those gaps, the state may find that additional water availability estimates should be prepared.

Assumptions:

Option 1:

- Water treatment facility information is available from MDNR's Safe Drinking Water Intended Use Plan (IUP).
- Surface water supply availability will be determined using USGS's gage data. Availability will be determined using the three return intervals to be determined by MDNR for average, wet and dry conditions. One climate scenario will be included.
- Reservoir water availability will be determined using the RESOP study to evaluate yield. USACE reservoirs will also be evaluated for storage and to evaluate reallocation.
- Groundwater availability will be assessed with existing groundwater data including the MDNR's well data monitoring network.

Options 2/3:

- Three climate variability scenarios (hot/dry, central tendency and warm/wet) and a scenario based on historic conditions for temperature and precipitation will be evaluated for the 2060 planning horizon.
- Reservoir water availability will be determined using the RESOP study to evaluate renewal storage. USACE reservoirs will also be evaluated for storage and to evaluate reallocation. Reservoir optimization modeling may be used to determine reallocation volumes.
- Groundwater availability will be determined from two existing groundwater models and additional modeling in areas where groundwater supplies appear to be limited as indicated by historical use (declining water levels) or quality.
- Well data will be provided by MDNR for areas where groundwater is declining.

Task 7 Evaluate and Analyze Methods to Meet Needs

One of the key tenants of state water planning is the principle of identifying a broad range of supply and demand management strategies, as well as inclusion of a complete set of water use sectors. At the same time, in some cases, existing planning efforts have identified the most effective and implementable

strategies. The plan will start with the principal of maximizing existing planning efforts to help ensure that local planning initiatives are respected, to promote efficiency and buy-in to the state planning effort, and reduce duplication of efforts. In some cases, existing, permitted and planned projects/capacity can meet all or a portion of long-term needs. The remaining unmet need or gap between supply and demand then becomes the principle focus of the decision-making process.

Projected demands will be compared to existing projects identified for each basin. This will allow for identification of infrastructure gaps. This gap analysis is essential, as it identifies the current and future needs for new water supply projects and management options.

The overall purpose of this task is the development and selection of a series of projects and strategies for addressing specific current or future water supply shortfalls and water and wastewater quality demands. Examples of strategies to be analyzed may include storage and conveyance infrastructure, treatment supply augmentation, existing supply management (e.g., reuse, USACE reservoir reallocation) and demand management (e.g., conservation and drought restrictions). Implementation of projects to meet environmental, recreational, navigational and power will also be identified in this task.

Assumptions:

Option 1:

- Information on planned infrastructure projects will come from a variety of sources. This would include a survey of water and wastewater providers (response rate for this could be in the 30 to 50 percent range), requesting data from:
 - The Missouri Water and Wastewater Review Committee
 - Missouri State Revolving Fund
 - U.S. Department of Agriculture Rural Development
 - Community Block Development Grant Program
 - Contacting large wholesale potable water and wastewater utilities in the state
- Gap analysis for municipal and industrial will be conducted to determine an infrastructure gap. This will be done by analyzing demands and subtracting projects identified by water providers.
- Gap analysis for other demand sectors will include agriculture, navigation, recreation and environment.
- In addition to projects, broad strategies for water supply will be evaluated. These strategies include:
 - Conservation
 - Reuse
 - New surface water supply development
 - Additional pumping
 - Reservoir storage, firm yield and reallocation

Options 2/3:

- Municipal and industrial infrastructure project lists will be based on planned projects from water and wastewater service providers. These lists will be compiled from a survey of water and wastewater providers.

The appropriate strategies will be evaluated for each of the planning areas. Appropriate strategies for each planning area will be informed by stakeholders and determined by the MDNR.

Task 8 Analyze Financials and Alternative Funding

As a result of the analysis of demands, constraints and opportunities, both a current and future set of implementation strategies and associated infrastructure costs can be projected for the future. MDNR's State Revolving Fund (SRF) program would be reviewed and identify shortfalls in future funding. These are reconnaissance-level estimates (plus or minus 50 percent). Nonfinancial considerations for prioritization should be taken into account, for instance recreational benefits.

*Assumptions:***Option 1:**

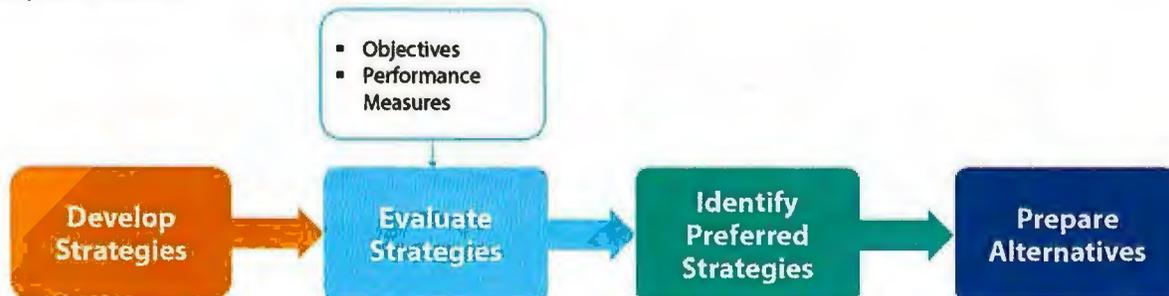
- Costs will be evaluated for each of the five planning regions including the general location, infrastructure needed to implement, and planning-level costs at plus or minus 50 percent level contingency.

Options 2/3:

- Objectives and performance measure will be determined from a broad stakeholder process.

Task 9 Develop Options to Address Local Concerns and Impact

Options to address local concerns will be developed and should include the following considerations: develop and evaluate water and wastewater supply projects and options consisting of structural and nonstructural measures that appear to be feasible as well as politically and socially acceptable; formulate water supply and wastewater options for the implementation of the most promising alternatives in each region; and build consensus among all parties to the study process as to which alternatives should be pursued for implementation.



The above steps can be accomplished through a facilitated, collaborative, consensus-based stakeholder process or through a more systematic analysis process. Both processes require developing a more clear understanding of the interrelationships among individual water supply options, both existing and new, requiring the entire water system be examined in a comprehensive fashion. If a more systematic analysis approach is preferred, a first step in evaluating water solutions is to develop comprehensive alternatives that represent combinations of supply strategies.

*Assumptions:***Option 1:**

- Objectives and performance measures will be determined from the interview process.

Task 10 Final Report

An Executive Summary and final report will be prepared. Each step will be included in separate sections. All database and documentation used will be provided.

Task 11 Public and Stakeholder Interaction

Citizens of Missouri are experts about their local water resources. They know the resources best. This innovative approach to stakeholder engagement outlined below builds upon recent academic research in effective public participation to listen to these experts first. From the beginning of the planning process, it engages, documents and incorporates citizens' water expertise to ensure current and anticipated concerns, ideas for solutions, and priorities inform and shape the entire planning effort.

Social and political acceptance within regions and local jurisdictions is an outcome of successful public engagement. Successful engagement acknowledges, listens to, and incorporates the water expertise of Missourians into water planning. Public and stakeholder engagement within this process will leverage the ongoing watershed planning efforts of *OMW* to ensure sound and coordinated outreach. Statewide public outreach and education is a fundamental part of the State Water Plan process to gain insight and input and garner constituent support for future funding.

Given the shared nature of the resource and naturally competing interests in the State Water Plan, collaboration will be paramount in successfully completing the plan.

*Assumptions:***Option 1:**

- Interview up to 60 to 80 representatives and leaders within Missouri's water community to define water values, current priorities, anticipated concerns and planning recommendations.
- Stakeholder involvement will focus on outreach to leverage the capacities of existing stakeholder groups and partnerships such as *OMW* and existing commissions and committees.
- Contribute content to the MDNR to include on the Web, newsletter, press release, public service announcement and speaker's bureaus.
- Public outreach support will include 15 meetings during 18 months.

Option 2/3:

- Two statewide stakeholder work groups will be formed to provide information and develop consensus on the approach, data sources and results for the demand and water availability. Both the demand and water availability work groups are anticipated to meet two times each to review the proposed approach and data and to review the findings for a total of four statewide meetings.
- Subgroups of the statewide demand and water availability work groups are expected to form and will meet on an ad-hoc basis.

Section 4 Costs



The following is a budget guideline by task for Option 1, if the MDNR chooses to move forward with the scope of services described in Section 3. Depending on budget and availability, CDM Smith can revisit the assumptions with the MDNR to meet its needs.

Task	Description	Total
Task 1	Evaluate Demographics, Economics and Trends	\$ 75,000
Task 2	Quantify Consumptive Demands	\$ 150,000
Task 3	Estimate Agricultural Demands	\$ 52,000
Task 4	Environmental, Recreational and Navigational Water Demands	\$ 52,000
Task 5	Water Quality and Improvements	\$ 349,000
Task 6	Analyze Surface and Groundwater Hydrology and Availability	\$ 224,000
Task 7	Evaluate and Analyze Methods to Meet Needs	\$ 376,000
Task 8	Analyze Financials and Alternative Funding	\$ 203,000
Task 9	Develop Options to Address Local Concerns and Impacts	\$ 216,000
Task 10	Final Report	\$ 103,000
Task 11	Stakeholder Involvement	\$ 200,000
Total		\$ 2,000,000

Note: These preliminary costs estimates do not include the USACE overhead or other contributive costs to the project, if funded through the Planning Assistance to States Program.

As demonstrated in CDM Smith's statewide planning qualifications (Section 5), the range of issues and approaches can vary greatly in support of a collaborative, comprehensive and contemporary water plan process. CDM Smith estimates that in order to complete the items listed as assumptions for Options 2/3 above, the total project cost could range from \$2 to \$4 million allowing 2 to 3 years to complete.

Section 5 Qualifications



About CDM Smith

CDM Smith is a consulting, engineering, construction and operations firm delivering exceptional service to public and private clients worldwide. An employee-owned corporation with over \$1 billion in annual revenues and a multidisciplinary staff of nearly 6,000 employees working from 120+ offices worldwide, we take pride in the freedom to put our clients first and apply our minds and passions to imagine and create sustainable solutions.

CDM Smith maintains the size, stability and resources to successfully undertake a diverse range of projects with a local staff of 45 employees.

Planning for Water

Water is among our most precious and strained resources—making statewide water resource planning of critical importance. Almost by definition, statewide planning often strains the traditional boundaries and takes a more comprehensive look at water use sectors not inherent in traditional water resource planning. Statewide plans at their core typically seek to establish a vision for sustaining and enhancing the social and economic conditions of the state and its various regions.

At CDM Smith, we have applied innovation to integrated resources planning, the developed system models and decision support tools, and have recent experience with incorporating climate change into decision-making efforts. In Oklahoma, Colorado, Georgia, California, Texas, West Virginia, Arkansas, South Carolina and IRPs in 15 states, the CDM Smith has facilitated and successfully completed water resource plans that focus on a collaborative and consensus-driven process. In addition, we have completed an assessment of state planning for the USACE. The CDM Smith Team's experience in statewide planning is unmatched.

CDM Smith has been supporting supply studies in concert with the MDNR and the USACE in both Northwest and Southwest Missouri over the past 5 years. These studies have evaluated source water supplies, USACE reservoir reallocation considerations and infrastructure needs, costs, and funding. Collectively, these studies continue to support the implementation of Missouri's State Water Plan.

UNPARALLELED STATEWIDE PLANNING EXPERTISE

OKLAHOMA (\$3 million)

In Oklahoma, our successful statewide planning effort focused on quantifying demands, supply and legal and physical supply gaps, improving planning capacity of the state and local utilities via modeling and analytical tool development and robust public outreach. With 82 major watersheds and a critical dependence on the Ogallala aquifer the CDM Smith Team worked closely with the USACE and Oklahoma Water Resources Board (OWRB) under a unique funding and political partnership. Our leadership and technical support provided the detailed quantification of available resources and also identified critical infrastructure needs though detailed outreach to local utilities. This provided the USACE and OWRB an understanding of resource, policy and legal constraints/limitations.

COLORADO (\$2.7 million for the first phase; 10 years, \$1-2 million per year)

In Colorado, CDM Smith has completed the most comprehensive analysis of water supply and resource needs in the state's history. Over

the last eight years, CDM Smith completed the Statewide Water Supply Initiative (SWSI) 1, SWSI 2, SWSI 2010, Basin Needs Assessments. In addition, we are currently completing the Basin Roundtable Basin Reports, five Annual Reports for the IBCC, assisted the CWCB in numerous planning efforts to integrate this technical work into each of the CWCB sections as well as supporting the agencies Water Supply Planning section.

GEORGIA (\$6 million)

CDM Smith worked with Georgia to completed its first statewide water development and conservation plan. This regionally-focused planning process required accommodation of Georgia Reasonable Riparian Use Laws and the need to look more closely at the sustainability of surface and groundwater use and development.

ARKANSAS (\$3 million over 2 years)

CDM Smith worked closely with the Arkansas Natural Resource Commission and various stakeholders to update the state water plan. CDM Smith was responsible for

generating a defensible and balanced forecast of agriculture irrigation water use for the entire state of Arkansas, including the intense water using area of the Delta. The forecast included detailed statistical modeling of irrigated acres based on historical trends and crop and county specific water application rates. CDM Smith communicated the working methodology to a diverse group of stakeholders and incorporated their qualitative knowledge into the final statistical model.

WEST VIRGINIA (\$2 million)

CDM Smith was recently selected to provide a statewide water plan for the State of West Virginia. The plan will include water supply demand, water quality, water modeling, shortage analysis and gap alternatives.

SOUTH CAROLINA (\$1 million)

CDM Smith was recently selected to provide a statewide modeling platform for South Carolina using the SWAM model.

INDUSTRY LEADER in INTEGRATED WATER RESOURCES MANAGEMENT

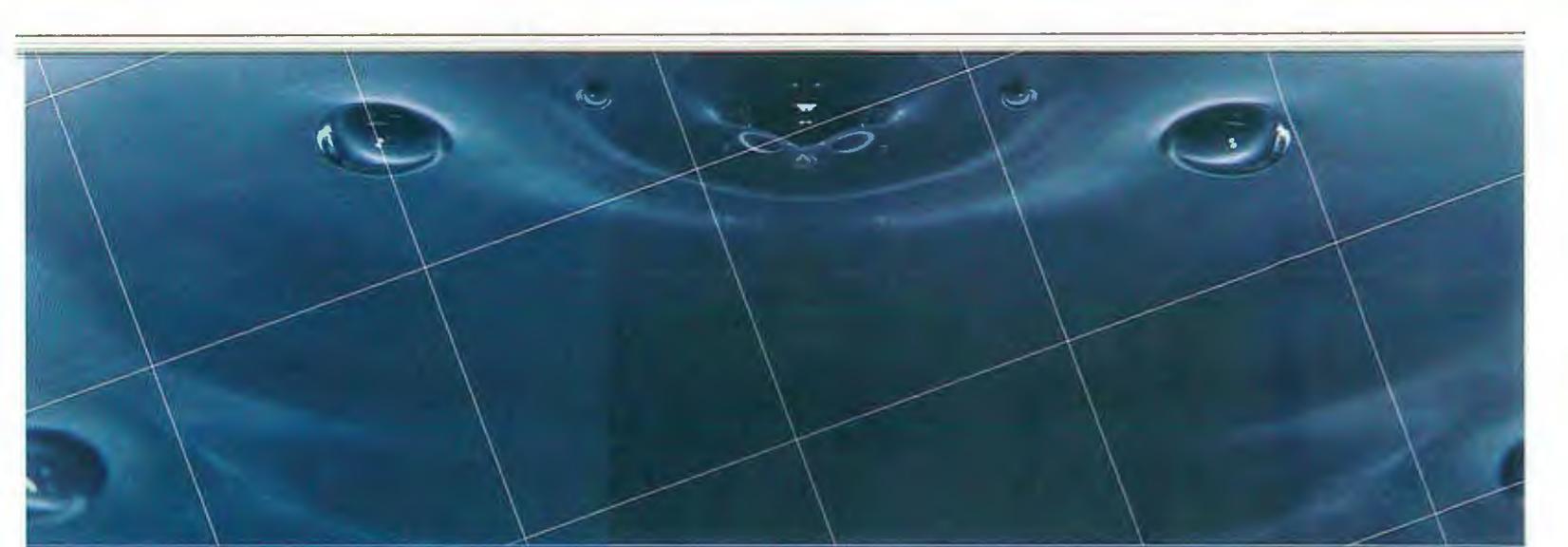


Nationally, CDM Smith has prepared more than 40 integrated resources plans and state and regional water plans involving stakeholder collaboration and decision making. These plans enjoyed broad stakeholder support, provided a framework for comprehensive water resources management and led to project implementation and funding. Tools utilized to develop decisions included IWR-MAIN, STELLA, and SWAM.

Team Member/Role	Biographical Summary
Mike Beezhold, Project Manager	Mr. Beezhold is a senior planner with over 20 years of water resources planning experience. Mike has been the Project Manager for the Southwest Missouri Water Resources Studies Phases I, II and III and the ongoing Stockton Lake Reallocation Study (2011 – Present). Mike also served as task manager for the Arkansas Statewide Water Plan.
Sue Morea, Senior Technical Specialist	Ms. Morea offers the MDNR 28 years of water supply planning and water quality experience. Sue Morea is CDM Smith’s statewide planning expert and has served as program manager and project director for the following statewide water plans Colorado, Georgia, Arkansas, Oklahoma, and South Carolina.
Pat O’Neill, P.E., Infrastructure Planning	Mr. O’Neill brings nearly 25 years of infrastructure planning and design experience including water treatment and distribution, wastewater treatment and collection, and water resources management. Pat’s primary focus has been working with various municipalities and utilities located across Missouri, Kansas, Iowa, and Nebraska to develop infrastructure solutions, address regulatory requirements, and identify funding alternatives.
Sarah Stewart, P.E., Water and Wastewater	Ms. Stewart is an environmental engineer with 13 years of experience with planning and design for both water and wastewater utilities, site-civil design; wastewater collection systems and treatment; water and wastewater pump stations; and, potable water treatment, distribution and storage design. Sarah has recently served as the Project Manager for the Northwest Missouri Water Supply and Alternatives studies.
Tim Feather, PhD., USACE Liaison	Dr. Feather’s focus has been on the development of interdisciplinary solutions to water supply challenges. Tim compiled a summary of the state water planning for all 50 states that was published by the American Society of Civil Engineers (ASCE) Environmental and Water Resources Institute. He then led a similar initiative for the U.S. Army Corps of Engineers, where each state was interviewed as part of the summary process. These state water summaries are found at http://building-collaboration-for-water.org/ .
Mark McCluskey, Supply Availability	Mr. McCluskey has over 15 years of experience in groundwater and hydrologic modeling, water supply, and water rights. Mark was the Project Engineer for the water supply aspects of the following statewide water plans; Colorado, Arkansas, and Oklahoma.
Bill Davis, Demands	Mr. Davis specializes in conducting water demand analyses, developing water use forecasts, evaluating water conservation programs and incorporating these analytical components into State Planning. Bill served as the Task Manager for the Oklahoma, Colorado, and Georgia Statewide demand forecasts.
Becky Dunavant, Water Quality	Ms. Dunavant has over 15 years of experience as an environmental scientist, specializing in water quality and water supply planning projects. Becky served as the Project Manager for TMDL Development for the Illinois Environmental Protection Agency. Becky served as task leader for the environmental water demands for Colorado, Oklahoma, and Arkansas.

Bill Mullican, Funding	In Mr. Mullican's over 30 years, Bill has had extensive interaction with the technical community, governmental entities at the local, state, and federal levels, stakeholders, and general public and provided invited testimony to the United States Congress on four occasions and on over 25 occasions to the Texas Legislature. Bill served as Deputy Executive Administrative for Water and Science Conservation, Texas Water Development Board 1997-2008.
Damon M. Hall, PhD., Stakeholder Involvement	Damon M. Hall, Ph.D. is an Assistant Professor in the Center for Sustainability, a graduate-degree granting research institute, at Saint Louis University in St. Louis, Missouri. Recently, Dr. Hall designed, conducted, and analyzed citizen engagement for the Scoping Phase for the Yellowstone River Basin's 2015 Montana State Water Plan sponsored by the Montana Department of Natural Resources and Conservation. More than 200 basin-wide water users participated in this phase within the Yellowstone Basin.

Full resumes available upon request.



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Ambient Water-Quality Monitoring in Missouri

—Emitt C. Witt, III and John Ford



Recreational use, North Fork River, Missouri.



Agricultural use, Spring Creek Basin, Missouri (Photograph courtesy of Rebecca Inman, U.S. Geological Survey).



Urban runoff, Kansas City, Missouri (Photograph courtesy of Don Wilkison, U.S. Geological Survey).

Introduction

During the last 31 years, the Missouri Department of Natural Resources (MoDNR) and the U.S. Geological Survey (USGS) have cooperated on a program to monitor the quality of the State's streams, springs, and rivers (hereafter referred to as surface water). This program is referred to as the Ambient Water-Quality Monitoring Network (hereafter referred to as Ambient Network) and was established to detect changes and determine trends in the quality of Missouri's streams and to provide the regulatory community with baseline data needed to enforce environmental law.

Although the level of funding and the number of monitoring stations have changed with time, the program has always focused on monitoring the present status of the State's surface water by using the most representative data-collection techniques and quality-assured laboratory procedures. Missouri has more than 21,978 miles of rivers that support recreation, agriculture, industry, transportation, and public utilities. The 1998 Missouri Water-Quality Report, published by the MoDNR, identified approximately 10,000 stream miles that are adversely affected by various physical changes or chemical contaminants. Because nearly one-half of the surface-water resources in Missouri are currently (2001) being affected, a major effort is needed to maintain the remaining resources and to improve the affected resources.

Urbanization, intensive agriculture, recreation, and the manufacturing industry are affecting water quality

throughout the United States. In the U.S. Environmental Protection Agency's (USEPA) 1998 report to Congress, 35 percent of the assessed streams and rivers in the United States are impaired beyond their ability to support designated uses (U.S. Environmental Protection Agency, 1999; 2000). Uses typically include drinking water, aquatic life support, fish consumption, recreational contact, and agriculture. In Missouri, nearly one-third of the surface water in the north and western regions support less than 20 percent of the designated uses. Also, more than 5 percent of aquatic species are at risk within the southeastern and southwestern regions (U.S. Environmental Protection Agency, 1998).

Missouri's population grew by more than 7 percent from 1980 to 1990 and by another 6.3 percent from 1990 to 1998 (U.S. Census Bureau, 1999). This growth has a substantial effect on Missouri's water resources. For example, the city of Springfield, although located over a substantial potable aquifer, must also use surface water from the James River and three reservoirs on the Sac and Little Sac Rivers to meet the city's demand for drinking water. The population increase in the city of Nevada has placed such a demand on the ground-water supply that salinewater is being pumped from the deeper aquifer to the shallow aquifer that has supplied the water for the city.

The future of Missouri is linked to the future quality of its water resources. Without an adequate water supply, population growth will be limited, agriculture will be hampered, and the recreational industry will suffer. Therefore, a system that monitors the changing quality of the surface-water resources is necessary, and

the Ambient Network has and will continue to serve this purpose in Missouri.

The Network

Ambient water-quality monitoring began in Missouri in 1969 with 18 sampling stations. By 1979 the network had increased by only two stations. From 1980 to 1986, the network increased to 41 stations. However, by 1991 funding had been reduced so that only 5 stations remained in the network. Realizing the need for an increase in baseline data, the MoDNR began reestablishing the network in 1993, and by the end of 1994, 34 stations had been added to the network. In October 1999, funds were allocated for an additional 24 stations, and Federal funds became available to support 2 more stations, which increased the total network to 65 stations (fig. 1).

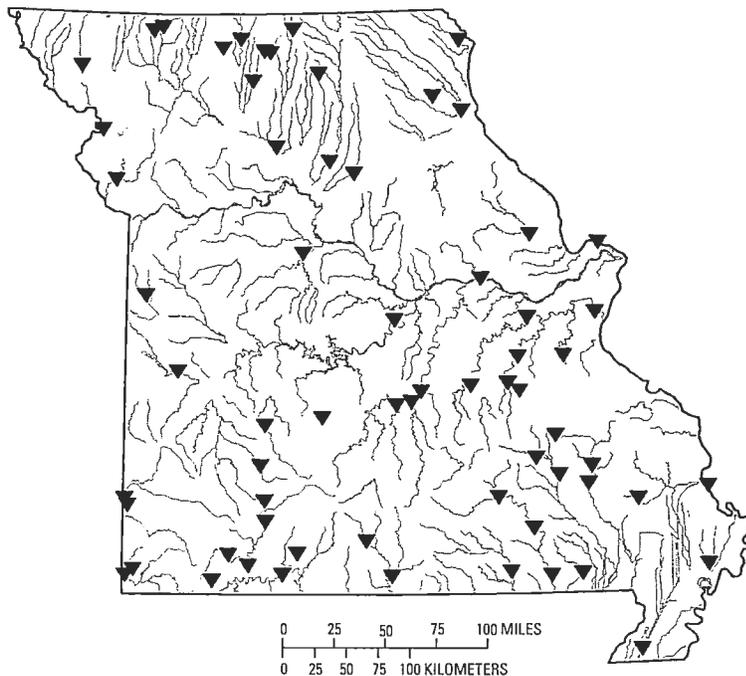


Figure 1. Location of stations in the Ambient Water-Quality Monitoring Network.

A committee composed of representatives from the MoDNR and the USGS is responsible for the selection of stations for the Ambient Network. Criteria for inclusion in the network are:

1. Moderate size surface waters that represent typical land use in a specific

physiographic province or aquatic ecoregion.

2. Surface waters with substantial land-use change occurring within their drainage basin, such as those affected by growing industry, expanding or changing agricultural practices, and urban development.
3. Surface waters with known water-quality concerns, such as those with point source inputs of contaminants.
4. Surface waters listed in the Missouri Water-Quality Standards as 'Outstanding Natural Resource Waters'.
5. Surface waters of special interest requiring the establishment of an initial data set.

The Ambient Network is a large effort that requires substantial financial support to operate. Labor associated with data collection and laboratory costs account for more than 51 and 18 percent of the total funding. The remaining expenses include vehicle rental, over-

night travel, miscellaneous supply purchases, and sample shipping.

The Ambient Network is supported by three major sources of funding. The first is from a share of the funds the State collects from judgements and settlements of water pollution enforcement cases, the second is from the USGS cooperative program, and the third is the Clean Water Act funding from the USEPA. These funds support a group of eight field technicians and one quality-assurance officer who sample and validate data collected from Missouri's surface waters.

Sample Collection

Samples are collected at stations in the network at varying frequencies. Of the 65 stations in the Ambient Network, 1 is sampled 4 times per year, 38 are sampled 6 times, 3 are sampled 9 times, and the remaining 23 are sampled 12 times. Sampling frequency is determined by a number of factors that include the drainage basin size, potential effects from cultural activity, history of chemical change, the need for short-term data, and cost. Lower sampling frequency helps to reduce the cost of the overall network by lowering costs for each station. With lower costs per station, more stations can be added to the network and provide wider coverage of the State's stream resources with a constant level of funding.

Methods used by the USGS for collecting representative water-quality samples are presented in detail in several publications (Ward and Harr, 1990; Wilde and others, 1998). In summary, there are two techniques to collect samples from a stream, the Equal Width Increment (EWI) and the Equal Discharge Increment (EDI). The EWI method requires the collection of subsamples within a cross section of the stream at equal distances apart (fig. 2). This method typically is used for streams with relatively even depth and flow. Water depths between sampling subsections generally do not vary by more than 10 percent.

The EDI method is based on equal discharge for each cross section of the river. More samples are collected in the deeper part of the river channel where most of the water is flowing (fig. 2). The EDI method is used for large rivers where shipping channels have deepened the streambed near its center. The EDI method is exclusively used for sample collection at Mississippi and Missouri River stations.

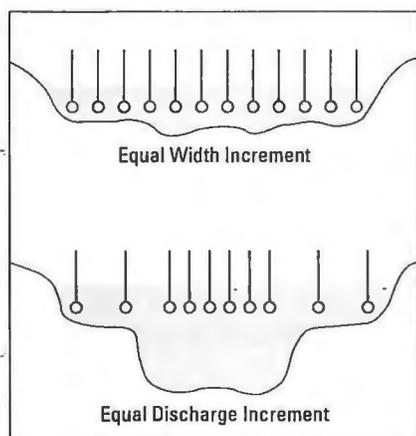


Figure 2. Methods for collecting samples in a cross section of a stream with shallow even flow and deep channelized flow.

Sample collection using either of the methods requires the use of a sampling device that maintains the representative chemistry of the water and collects a representative parcel of water. Because materials used to construct sampling equipment can directly affect sample chemistry, relatively inert materials are used that will not contribute to or remove constituents from the sample. The material currently used is Teflon¹.

A sampler also must collect a representative volume of water within a subsection without any flow-disturbing effects from the body of the sampler. Water flowing into the sampler must represent the water within the area of the sampler opening. The term given to such a sampling device is 'isokinetic sampler'. Two types of Teflon isokinetic samplers are used in the Ambient Network; the D-77, modified for use with a

¹The use of brand names in this fact sheet is for identification purposes only and does not constitute endorsement by the U.S. Geological Survey.

Teflon bag (collapsible bag sampler) and the DH-81 hand-held sampler. The collapsible bag sampler typically is used where flow and depth conditions are too extreme to wade within the cross section. This sampler is suspended by a cable from either a bridge deck or a boat and lowered into the water at a constant rate (fig. 3). This 'transit rate' is calculated based on the depth and velocity of streamflow and the size of the nozzle attached to the sampler. The DH-81 sampler is used for small streams and during low-flow conditions where wading a cross section is safe. A transit rate is determined before sampling begins.



Figure 3. Use of a collapsible bag sampler on the Mississippi River at Thebes, Illinois.

Samples collected from each subsection of the cross section are composited in a common vessel during the sampling process, which ensures that the sample sent to the laboratory for chemical analysis is a representative sample. The time required to complete sampling of a cross section is from 2 to 4 hours, depending on the size of the stream, flow conditions, accessibility, and weather.

Constituents Measured

The composite sample is processed onsite in a USGS mobile field laboratory within 1 hour of collection. Aliquots of sample are removed from the common vessel and analyzed for pH and alkalinity. Temperature, dissolved oxygen, and specific conductance are measured instream at the centroid of flow during the sample collection process. Indicator bacteria are processed from a grab sample collected at the centroid of flow.

Additional aliquots of sample are processed using filtration and chemical preservatives for shipment to the USGS National Water Quality Laboratory in Denver, Colorado. Constituents measured in the laboratory include nitrogen and phosphorus species, major ions, chemical oxygen demand, trace metals, suspended solids, dissolved solids, organic carbon, and 47 pesticide compounds. Laboratory procedures meet quality-assurance procedures by the USGS and generally exceed the detection levels of similar analyses required for compliance purposes by the USEPA (Fishman and Friedman, 1989; Faires, 1993; Zaugg and others, 1995).

The USGS follows procedures to ensure the physical properties of the stream can be linked to the chemical composition of the sample collected. Therefore, before sample collection, the USGS technician either measures the flow in the stream or records it from an existing gaging station. In either case, the procedures for obtaining a flow value are given in Rantz and others (1982). Flow data in conjunction with a water-quality sample are useful during the data validation and interpretation process. Flow data permit scientists to calculate loads of various chemicals in surface water, determine the effects of dilution on surface-water chemistry, and determine the time it will take for contaminants to travel downstream. Twenty-four of the 65 Ambient Network stations have a permanently installed stream gage where a stage discharge relation has been established for the continuous calculation of flow. At the remaining stations, flow is measured using a current meter and appropriate techniques to provide an instantaneous measurement.

Uses for the Data

The USGS has many uses for the data it collects, but the most important use is for answering environmental quality questions on a National level. Specific uses of water-quality data include characterizing the quality of streams within different physiographic plateaus and geohydrologic regimes; determining and understanding the changes in chem-

istry with time and defining trends as they relate to land use and water use change; establishing control points for smaller, site-specific environmental projects; and providing a source of unbiased data for use by State and Federal regulators, as well as research scientists in the public, private, and academic sectors.

The MoDNR uses the data to characterize 'ambient' water quality within and between aquatic ecoregions in Missouri; characterize diurnal, seasonal, and flow-related effects on water quality; characterize water-quality effects of specific point or nonpoint source areas; analyze data for long-term trends; and check for compliance with State water-quality standards.

Data Availability

All data collected for the Ambient Network and other USGS water-quality projects are stored in the National Water Information System (NWIS) data base. Before data are committed to the data base, they are carefully screened for transmission errors, analytical anomalies, and balance with other data collected from the same sample. Data collection, processing, and validation procedures are described in the Quality Assurance Project Plan (QAPP) developed for the network annually. The QAPP is an unpublished document, but it may be reviewed by contacting the Missouri Water-Quality Specialist (573-308-3829 or jdavis@usgs.gov). Following validation, the data are available for use by the public.

Data contained in the NWIS data base were transferred to the USEPA STORET data base annually until March 1999. Future data will not be transferred to STORET until the compatibility concerns between NWIS and STORET are resolved.

The Missouri District Water-Quality Specialist is available to assist with data retrievals from the NWIS data base.

Historical data from 1995 to the current year are available in Adobe Acrobat Portable Document Format on the Missouri homepage <http://mo.water.usgs.gov>. All historical data are available on the National USGS web page <http://water.usgs.gov/nwis>.

In addition to the availability of data on the Web, data are published annually in "Water Resources Data for Missouri". This hydrologic-data report for Missouri is one of a series of annual reports that document hydrologic data collected from USGS surface- and ground-water data collection networks in each State, Puerto Rico, and the Trust Territories. Copies of the annual report may be obtained by contacting the Director of Missouri (573-308-3667) or sending an email request to mo_reports@usgs.gov.

References

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- Faires, L.M., 1993, Methods of analysis by the U.S. Geological Survey National Water Quality Laboratory—Determination of metals in water by inductively coupled plasma-mass spectrometry: U.S. Geological Survey Open-File Report 92-125, 28 p.
- Rantz, S.E., and others, 1982, Measurement and computation of stream-flow—Volume 1, Measurement of Stage and Discharge: U.S. Geological Survey Water-Supply Paper 2175, 284 p.
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- 2000, The quality of our Nation's waters—A summary of the National water quality inventory: Washington, D.C., 1998 report to Congress: EPA 841-5-00-001, Office of Water (4503F).
- Ward, J.R., and Harr, C.A., eds., 1990, Methods for collection and processing of surface-water and bed-material samples for physical and chemical analyses: U.S. Geological Survey Open-File Report 90-140, 71 p.
- Wilde, F.D., Radtke, D.B., Gibs, J., and Iwatsubo, R.T., 1998, National field manual for the collection of water-quality data: U.S. Geological Survey Techniques of Water-Resources Investigations, book 9, chap. A2, 60 p.
- Zaugg, S.D., Sandstrom, M.W., Smith, S.G., and Fehlberg, K.M., 1995, Methods of analysis by the U.S. Geological Survey National Water-Quality Laboratory—Determination of pesticides in water by C-18 solid-phase extraction and capillary-column gas chromatography/mass spectrometry with selected-ion monitoring: U.S. Geological Survey Open-File Report 95-181, 60 p.

For more information contact any of the following:

For water information:
U.S. Geological Survey, Director
1400 Independence Road, Mail Stop 100
Rolla, Missouri 65401
(573) 308-3667 or "<http://mo.water.usgs.gov>"

For more information on all USGS reports and products (including maps, images, and computerized data), call 1-888-ASK-USGS

Additional earth science information can be found by accessing the USGS "Home Page" on the World Wide Web at "<http://www.usgs.gov>"



**JOHNSON COUNTY SOIL & WATER
CONSERVATION DISTRICT**

727 PCA ROAD, SUITE B
WARRENSBURG MO 64093
(660) 747-8400 Ext. 3

Mach 30, 2016

DNR Soil & Water Conservation Program
ATTN: Soil & Water Commission
P.O. Box 176
Jefferson City, MO 65102

Dear Soil & Water Commission:

The Johnson County SWCD is requesting the Soil & Water Commission to appoint Danny Weigand 327 NW 900 RD Warrensburg, MO 64093. This appointment would be for the remaining 2 years left on the term of Steve Ring, who has resigned from the board effective March 30, 2016.

Attached are the resignation letter from Steve Ring and the Verification of Supervisor Eligibility form for Danny Weigand.

Thank you,

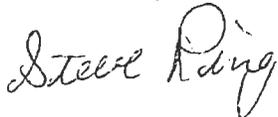
Tom Haun
Board Chairman

March 29, 2016

Dear Board Members,

It has been a pleasure to serve on the Johnson County Soil and Water Board over the past several years. Please accept this as my letter of resignation from the board effective March 30, 2016. I would like to thank the board for the opportunity to serve over the past several years and wish everyone the best of luck.

Sincerely,

A handwritten signature in cursive script that reads "Steve Ring". The signature is written in black ink and is positioned below the word "Sincerely,".

Steve Ring

VERIFICATION OF SUPERVISOR ELIGIBILITY

**To qualify for office, according to Missouri's Code of State Regulations,
10 CSR 70-2.020, Conduct of Supervisor Elections, a candidate shall:**

- 1) Be a land representative as defined by "The owner, or representative authorized by power of attorney, of any farm lying within the soil and water conservation district (SWCD); provided, however, that any land representative must be a taxpayer of the county within which the SWCD is located," and
- 2) Be a resident taxpaying citizen within that SWCD for two (2) years preceding the appointment to the District Board of Supervisors by the Commission, and
- 3) Be a cooperater of the SWCD defined as "A person who is actively involved in farming and practices conservation activities related to agriculture," and
- 4) Reside in or own a farm lying in the same territory where the board position is vacant.

Danny Weigand
327 NW 900
Warrensburg, MO 64093

The undersigned certify that the candidate meets all of the above stated eligibility requirements to serve as a supervisor for the Johnson County Soil and Water Conservation District.

Chairperson (or acting) Signature: Tom W Date: 3-30-16

Candidate Signature: Danny Weigand Date: 3-29-16

Callaway Soil and Water Conservation District
4549 State Road H, Fulton, MO 65251
(573) 592 – 1400

February 23, 2016

Members of the Commission:

In late August, 2015, Callaway SWCD had contact with a landowner who expressed interest in participating in the cover-crop program. The Callaway SWCD technician met with him on 4 September 2015 to take an initial look at his farm, discuss the requirements of the program – as they were understood – and, to perform soil sampling.

Over the next several weeks, a series of events caused the opportunity to help this landowner to slip through the cracks.

First, Callaway SWCD had no landowners who participated in the cover-crop pilot program, so we had never written a contract for this practice before. The staff at Callaway SWCD either missed or failed to attend, any training that may have been provided by the program office on how to implement this new program. That is a failing on our part to properly prepare for the new program and how it was to be administered.

Second, related to the first, we had a lack of understanding as to how and why the soil tests were being performed. Upon calling other districts for advice, some districts informed us that all the soil tests must be performed and results received prior to any plan being approved. Other districts indicated that the tests could be run in conjunction with a signed contract, without results. Still, other districts informed us that the tests weren't required at all, as the follow-up tests were merely a recommendation - not a requirement - of the program; and without the follow-up tests to determine loss or gain, the results of the initial tests would be immaterial.

Third, we faced a significant backlog of erosion control work involving structures that had been delayed due to a wet spring and late crop harvest. When a decision where to place emphasis arose, I elected to put the priority on landowners who had been on the list the longest; the erosion control measures that had been signed up for – in some cases – years prior to the cover-crop practices even being announced.

Through these issues; the window of time to successfully plant cover crops was closing. Time overtook our ability to take care of our landowners in a manner we would like. The result of this failure, was this landowner being forced to decide rather to plant – without a contract, and in good faith that we would be able to cost share with him – or deciding not to participate in cover crops at all. This landowner took the greater risk, by participating without a contract, and now is – understandably – upset that we cannot cost share with him on this project.

Callaway Soil and Water Conservation District
4549 State Road H, Fulton, MO 65251
(573) 592 - 1400

We feel like there were several breaks in the chain on the program delivery portion of this practice. Some of them are directly our district's failing; and we acknowledge that. However, some of the breaks involved aspects beyond our control, such as; insufficient training or instruction on program delivery, almost state-wide misunderstanding of program requirements, and weather delays.

As this particular landowner took the initiative to complete the cover crop practice to the specifications required, we would like to ask that the commission allow this landowner to participate as if he had a signed contract from the very start.

Thank you for your time,



Matt Blansett

District Specialist III

Callaway SWCD

Mb

Mark Smart,



Callaway SWCD Board Chairman

Callaway Soil and Water Conservation District
4549 State Road H, Fulton, MO 65251
(573) 592 - 1400

Timeline of N340 Cover Crop Practice

9-1-2015 Landowner called discussing interest in the cover crop practice.

9-4-2015 Soil samples were taken in two fields on property.

9-18-2015 Received word that mixture of Winter Rye, Tillage Radish, and Turnip had been planted, including 1 ½ tons of pot ash spread.

2-23-2016 Landowner contacted the office asking about the payment on his cover crop planting.

LEWIS SOIL & WATER CONSERVATION DISTRICT

504 S. WASHINGTON ST., MONTICELLO, MO. 63457

573-767-5276 ext 3

Lewis SWCD Supervisors

Ron Krueger, Chairman

David McCutchan, Vice-Chairman

David Stice, Treasurer

Brenda Arnold, Secretary

Randy Scoggin, Member

March 17, 2016

Soil & Water Conservation Commission
P.O. Box 176
Jefferson City, MO. 65102-0176

Soil and Water Conservation Commission,

In August and September 2015, Lewis County SWCD processed over 30 cost share contracts for cover crops and in the process one contract was overlooked and not completed.

On March 11, 2016, Clint Briscoe was in the Lewis Co SWCD office in order to verify the office had all the information they would need to process payments for his N340 contracts. While reviewing the SHAC information provided by the program office on March 8, 2016, the district and Mr. Briscoe discovered one contract had been overlooked by the district staff and had not been processed. This operator had signed up several landowners and was approved for 4 other N340 contracts. The operator was under the impression that all contracts had been approved for cost share so he planted the cover crop last year and submitted the required soil sample for the overlooked farm to the Soil Health Assessment Center.

On the overlooked property, Landowners Cottingham, Flynn & Flynn with the assistance of Operator Clint Briscoe requested cost share assistance for 2 fields totaling 88.4 acres to plant wheat as the cover crop. The case file had the completed landowner authorization and vendor input forms but no other paperwork has been completed. If approved, the contract would provide cost share for 88.4 acres at \$30 per acre (for 1-2 species) as well as one soil test. The total cost share amount for this N340 contract would be \$2719.50. The Lewis Co SWCD has sufficient FY16 cost share funds to fund this contract. We feel this was an oversight of the district staff and not the landowner or operator's fault.

The Lewis County SWCD requests the commission to grant approval for a N340 cost share contract for a total of \$2719.50 for Cottingham, Flynn & Flynn. We appreciate your consideration in this matter.

Sincerely,



Ronald Krueger, Chairman
Lewis Co SWCD

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, gender, religion, age, disability, political beliefs, sexual orientation, and marital or family status. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at 202-720-2600 (voice and TDD). To file a complaint of discrimination, write USDA, Director, Office of Civil Rights, Room 326W, Whitten Building, 14th and Independence Avenue, SW, Washington, DC 20250-9410 or call (202) 720-5964 (voice or TDD). USDA is an equal opportunity provider and employer.



Camden County Soil and Water Conservation District
275 Old South 5 - Camdenton, MO 65020 - Phone: 573-346-5125

March 22, 2016

Missouri Soil & Water Conservation Commission
PO Box 176
Jefferson City, MO 65101

Dear Commission Members:

RE: Request for Cost-Share Variance

We would like to request a variance for one of our landowners. Mr. Leonard C. Franklin, a Camden County landowner, has recently started actively working his farm. He came to our office in January 2015 for advice for his farming operation. He brought soil tests and our technician made recommendations and discussed the DSP-2 --No-Till program with Mr. Franklin. After visiting the farm our technician also suggested Mr. Franklin attend a grazing school. Mr. Franklin did attend a school in April of 2015. In August of 2015, Mr. Franklin brought in updated soil tests. At this time our technician worked up information for the DSP 3.4, Grazing System Lime. Mr. Franklin was approved for 191.6 acres of lime and paid \$8560.11 in November of 2015.

This month, March 2016, Mr. Franklin contacted our technician requesting more information on proceeding with fertilizer and seed. The technician informed him he was not eligible to do cost-share since his acreage was under the DSP3-4 maintenance agreement.

Mr. Franklin feels he has not been treated fairly and the technician gave him bad advice. Evidently Mr. Franklin thought he was working on a DSP-2 practice and applying the lime six months in advance, which according to his soil test was necessary.

If Mr. Franklin had completed 160 acres of the no-till practice he would have received about twice the amount he received for applying just lime on the 191.6 acres.

Since Mr. Franklin is not familiar with our cost-share program and not familiar with our acronyms, we feel there was not adequate communication between our technician and the landowner. We have also spoken to our technician about his communication, making sure new clients are aware of the practices and giving better advice.

Earnest L. Calvert
Chairman

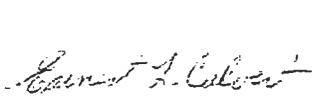
Joseph Moulder
Vice-Chairman

Jeff Apperson
Secretary

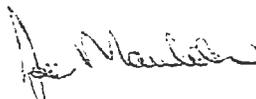
Troy Frederick
Treasurer

We are asking a variance be approved, allowing the landowner to utilize the DSP-2 but not paying on the lime since it has already been applied and paid. We feel Mr. Franklin was earnestly trying to improve his farm and came to our office anticipating accurate advice. We do not want to leave a bad impression on the Soil and Water program and would like to create a more positive image, while also improving Mr. Franklin's farm.

Sincerely,



Earnest L. Calvert
President



Joseph Moulder
Vice-President



Jeff Apperson
Secretary



Troy Frederick
Treasurer

DSP-02 Permanent Vegetative Cover Enhancement

Purpose

1. Reduce soil erosion and improve water quality.
2. Improve the productive cover of existing pastureland with the demonstration of no-till, inter-seeding of legumes by the use of no-till drills; to protect the soil and prevent the pollution of air, land or water from agricultural uses.

Applicability

1. Applies to pastureland and hay land only where non-woody, permanent vegetative cover is in poor or very poor condition, with less than thirty percent (30%) introduced legumes, to be improved to good condition; or to fescue pastureland in better than poor condition with less than thirty percent (30%) introduced legumes and where fescue-endophyte fungus infestation levels are greater than thirty percent (30%) and less than seventy percent (70%). The argument has been made that during certain times of the year, a particular fescue stand will show lower levels of endophyte infestation than what is actually present. The board, with the help of University Extension, should make every effort to inform the cooperator of the proper method and timing of taking the endophyte test. The purpose of the endophyte test is to determine the level of infestation. The test should not be taken just to qualify for cost-share.
2. In the case of fescue eligibility, the percent legume in the fescue pasture must be less than thirty percent (30%). Lespedeza is excluded from the measurement. The fescue-endophyte infestation level must be greater than thirty percent (30%) and less than seventy percent (70%) as determined by a proper endophyte test. Refer to NRCS Technical Note No. 17.
3. For purposes of this practice, poor pasture condition shall include "poor" and "very poor," with numeric values of 20 or less as determined by the use of the JS-Agron 24.

Erosion Requirements

Practice is eligible for cost-share based sheet and rill erosion. Pre-installation erosion rates must be less than or equal to tolerable soil loss.

Sheet & Rill Erosion Checks: PRE-INSTALL < OR = T

Specifications

The completed practice must meet the NRCS Standards and Specifications for Forage and Biomass Planting (512), Prescribed Grazing (528), and Vegetation Establishment, Herbaceous Seeding (723) contained in the Field Office Technical Guide.

Policies

1. Haying is permitted to manage and maintain the legume when grazing alone does not control grass and weed growth.

2. *Cost-share is authorized for:*

- a. Limestone and fertilizer. Assistance is limited to the minimum requirements based on legume establishment recommendations, as determined by a soil test. Cost-share for limestone may be approved for the amount needed up to a maximum of 1,500 pounds effective neutralizing material (ENM). Any amount over 1,500 pounds of ENM is the cooperator's responsibility. For those tests which have an ENM requirement of less than 600 pounds per acre, the cooperator has the option of applying the requirement.
- b. Interseed Legumes. Permanent vegetative cover based on the DSP-02 Interseed Legumes component.
- c. Reseeding, under the conditions listed in Section V, subsection E, for a maximum of 80 acres.

3. *Cost-share is not authorized for:*

- a. Measures which would constitute complete re-establishment of existing cover.
- b. Nitrogen.
- c. Nutrient application based on crop production goals rather than establishment recommendations.
- d. Nutrient build-up. Fertilizer application is to be consistent with one year's nutrient requirements for a four or eight year nutrient buildup plan.
- e. Chemicals.
- f. Broadcast or aerial sowing of legume seed.
- g. Woody or rocky fields where a no-till drill would not perform adequately.
- h. Fields where woody vegetation has been cleared and no improvements or maintenance of soil cover has since been performed.
-  i. Land already established in permanent vegetative cover which is under the maintenance agreement of any program.
- j. Fields with pre-install erosion rates above "T."
- k. Harvest of grass or legume seed.

Maximum State Cost-Share

1. Assistance can not exceed 160 acres per cooperator for all farms owned by that cooperator. If the land changes ownership, the new owner would be eligible to receive cost-share for the practice provided the land qualifies and the new owner has not previously met the cost-share maximum for the practice. It is the board's responsibility to see that the commission's intent that no more than 160 acres of DSP-02 is demonstrated per cooperator.
2. Assistance is limited to 75% of the county average cost, not to exceed the state average cost.
3. Utilize the Practice Limits Detail report in MoSWIMS to ensure compliance with applicable maximums.

DSP 3.4 Grazing System Lime

Purpose

1. Improve or maintain desired species composition and vigor of plant community.
2. Improve or maintain surface and/or subsurface water quality and quantity.
3. Improve or maintain riparian and watershed function.
4. Reduce accelerated soil erosion and maintain or improve soil condition.

Applicability

Applies to pastureland where permanent vegetative cover is established and can be enhanced through the use of a planned grazing system. The system operator must follow an approved grazing system plan. The system operator must attend an approved grazing school provided by University of Missouri, in conjunction with NRCS, prior to the district's submittal of a contract for review.

Erosion Requirements

Practice has no erosion requirements.

Specifications

The completed practice must meet the NRCS Standards and Specifications for Prescribed Grazing (528), and Nutrient Management (590) contained in the Field Office Technical Guide.

Policies

1. Cooperators must have an approved grazing plan prior to contract board approval.
2. ***Cost-share is authorized for:***
 - a. Lime application on existing systems that meet NRCS standard and specifications for Prescribed Grazing (528).
 - b. One time application of lime in accordance with minimum cover improvement needed, as determined by a soil test.
 - 1) If determination is made that requires application of greater than 1,500 lbs. of ENM per acre, the cooperator is required to apply a minimum of 1,500 lbs. of ENM per acre. Cost-share may be provided for more than 1,500 lbs. of ENM, not to exceed the maximum of \$50 per acre.
 - 2) If lime is applied in split application when large amounts of ENM are required, the contract must remain unpaid until all lime is applied.
3. ***Cost-share is not authorized for:***
 - a. Lime, if N590 Nutrient Management was previously completed.

Maximum State Cost-Share

1. Assistance is limited to 75% of the established county cost, not to exceed the state average cost.

2. Maximum of \$50 per acre for a one time application of limestone and in accordance to the soil test recommendations for a planned grazing system.
3. Utilize the Practice Limits Detail report in MoSWIMS to ensure compliance with applicable maximums.

Map Requirements

1. Shapefiles from NRCS's Toolkit program must be saved on the district's T:\ drive prior to contract approval. The shapefiles must contain attributes that show the following information that pertains to the contract:
 - Farm Perimeter
 - Acreage Completed under DSP 3.4 and/or DSP 3.5
 - Location of Power Source
 - System Acreage
 - Field Numbers
 - Any other feature that may affect the completed system.
 - a. Planned items must be shown and labeled with the fiscal year to be installed.
 - Planned Fence
 - Planned Pipeline
 - Planned Water Source
 - Planned Watering Facility (Specify Tank or Hydrant)
 - Planned Lime Application
 - Planned Seeding Application
 - b. Existing items must be labeled with the fiscal year installed and funding source (EQIP, SWCP, etc.).
 - Existing Fence, including existing perimeter and cross fences
 - Existing Pipeline
 - Existing Water Source
 - Existing Watering Facility (Specify Tank or Hydrant)
2. A map that displays the completed practice must be scanned and attached as a document type "Map" in MoSWIMS prior to contract payment submission.

Technical Responsibilities

Technical staff has the responsibility for determining the need for the practice, for design of the practice based upon the minimum extent necessary, and to certify that the completed practice meets NRCS standards and specifications within commission policy.

Acres Served

Acreage established in permanent vegetative cover that is treated with lime. Heavily forested acreage and cropland are not eligible.

Extent Installed

Acres.

Maintenance Life

5 years.



Gasconade County Soil and Water Conservation District

314 South Olive - Owensville, MO 65066 - Phone (573) 437-3478 - Fax 855-842-7890

March 10, 2016

Soil & Water Conservation Commission
Department of Natural Resources
PO Box 716
Jefferson City, MO 65101

Dear Commissioners,

We would like to request a variance to the Cover Crop no-tillage requirement due to the recent flooding event that happened here in Gasconade County.

We are attaching pictures of the fields for Aaron Bossaller, contract # 062-16-0012 (\$876.00) and 062-16-0013 (\$1,762.50). Mr. Bossaller has turned in all of his receipts for the cost of adequate seed and the soil health analysis requirements.

Due to the recent flood event, he has several areas in the field that must be addressed before he can no-till his cash crop of soybeans. He would like to vertically till the areas to smooth them down so that he can "safely" no-till his crop. There will be minimum tillage involved.

We ask that you provide Mr. Bossaller, with a one-time variance to vertically till his fields in preparation for no-till planting, while maintaining his current contracts. Thank you for your consideration in this matter.

Sincerely,

A handwritten signature in black ink that reads "Mike Haeffner".

Mike Haeffner
Vice-Chairman, Board of Supervisors

Board of Supervisors
Dennis Berger, Chairman
Mike Haeffner, Vice-Chairman
Matt Estes, Treasurer
Debra Nowack, Member
Matt Herring, Secretary

Helping People Help the Land

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Franklin County SWCD Board Letter

To: Soil and Water District Commission

This letter is in regards to our Cover Crop (N340) practice.

Here in Franklin County, several of our cover crop participants had received damage to their fields from the December Flood event, through multiple sand deposits and scouring.

We are requesting a variance to the cover crop policy to allow landowners to use tillage practices to smooth out their fields, to have a uniform seed bed for future planting for crops.

Know Contracts:

002-16-0019

002-16-0015

002-16-0013

 5 Apr 2016
Franklin Co. SWCD Board

N340 Cover Crop

Purpose

Provide operators an incentive to encourage the adoption of cover crops for reducing soil erosion, improving water quality and soil health.

The definition of operator for the purpose of this practice is any individual farming the land, who has incurred the expenses for the cover crops. The operator's name should also be listed on file with FSA as the operator of such land.

Applicability

Applies to cropland acres where row crops are grown and soil erosion needs to be prevented or water quality and soil health improved.

Erosion Requirements

Practice has no erosion requirements to qualify. However, pre- and post-erosion rates need to be recorded in MoSWIMS to capture the erosion benefits of the practice.

Specifications

The completed components of the practice must meet the NRCS Standards and Specifications for Conservation Crop Rotation (328) and Cover Crop (340) contained in the Field Office Technical Guide.

Policies

1. The contract must contain the name of the legal owner. If an operator is participating, the landowner must complete an "Operator Authorization" form.
2. Contracted acres must currently be in a minimum of a 2 species production crop rotation.
3. Cover crops must be no-tilled or broadcast seeded with either ground equipment or aerial.
4. Production crop following the cover crops must be planted using a no-till system on the contracted acres. No-till is defined as per standard 329 for Residue and Tillage Management No-Till.
5. Payment can be issued after no-till planting of the production crops into the (terminated) cover crops or after May 25 if the production crop has not yet been planted.
6. Cooperators must adopt cover crops in compliance with the **Cover Crop (340)** standard as part of this practice. In addition:
 - a. All cover crop seedings must be planned with a minimum of 25% cool-season annual grass, small grain component or warm season grass. (Caution should be taken when selecting Annual Ryegrass for a cover crops mix.)
 - b. Spring planted cover crops must have been planted at least 60 days prior to being terminated.



- c. Cover crops will be terminated as late as practical to maximize plant biomass production and nutrient uptake. Landowners need to take into consideration timing for next crop and crop insurance requirements.
- d. Cover crops will not be harvested for grain, seed or hayed.
- e. Cover crops may be grazed once the forages have reached a minimum height of 6–8 inches with enough biomass produced to justify grazing. However, grazing should not occur if it will damage the forages so that their effectiveness as a cover crop would be impacted. Grazing will need to stop once the forages have been grazed down to 4 inches.
- f. Tillage cannot be used to terminate the cover crops.
- g. N595 Pest Management practice may be utilized to terminate the cover crops. The pest management plan must be developed to address the termination of the cover crop and all pest issues that may occur during the next production crop growing season.
- h. A soil sample for the Initial Standard Soil Health Package test through the Missouri Soil Health Assessment Center (SHAC) must be taken on each field prior to seeding cover crops. The initial sample will need to be taken only for the first state cost-share contract on the field. The number of samples per field will be determined by the sampling requirements provided by SHAC.

There is a second soil health test through SHAC called Follow-Up Standard Soil Health Package that landowners are encouraged to do four or five years after implementing cover crops on a field. If a landowner receives cost-share again on a field four or five years later to implement the practice, the landowner can receive a cost-share payment on the cost of the test. The number of samples per field will be determined by the sampling requirements provided by SHAC.

7. The NRCS MO JS Agron 340 Cover Crop Design Worksheet documentation must be scanned into MoSWIMS as supporting documentation when the contract is submitted for review.

Cost-share is authorized:

- a. For incentive payments for operators (including landowner-operators) who implement all required components of the Cover Crop practice.
- b. For soil health assessment testing through the University of Missouri SHAC for either the Initial Standard Soil Health Package or Follow-Up Standard Soil Health Package.

Cost-share is not authorized for:

- a. Cover crops in pasture or hay land.

Maximum State Cost-Share

1. Operators participating in the Cover Crop practice will be eligible for 75% of the component cost of the test through SHAC and an incentive payment of \$30/acre/year for a 1 or 2 species cover crop mix or \$40/acre/year for 3 or more species cover crop mix with a life time maximum total payment of \$20,000 per operator. Utilize Practice Limits Detail report in MoSWIMS to ensure compliance with applicable maximums.