



Florida Department of Environmental Protection
Division of Environmental Assessment and Restoration

***Gemini Springs and DeLeon Spring
Basin Management Action Plans
(BMAPs)***

***Moira R. Homann
March 8, 2018***





Agendas

Gemini Springs and DeLeon Spring BMAP Meeting

- Recap Items – *Moira Homann*
- New Items/Discussion – *Moira Homann*
 - Revised OSTDS Policies
 - Reduction Estimates from Projects
 - Calculation approaches
 - Starting year for project credits
 - Review of reductions necessary
 - Gap Analysis
 - Remaining load to be addressed
 - Additional Reduction Options
 - Timeline for BMAP Development
- Public Comments and Action Items – *All/Tiffany Busby*
- Adjourn – *Moira Homann*



OSTDS Restoration Approaches

- OSTDS Remediation
- New OSTDS
- Education
- Rulemaking and Implementation
- Funding



OSTDS Remediation

Nitrogen Enhancement/"On-Site AWT"

- Features achieving at least 65 % nitrogen reduction
- Systems approved by Florida Department of Health (FDOH)

Connection to Sewer

- OSTDS is properly abandoned and property is connected to sewer service



New OSTDS

- As required by statute:
 - New OSTDS within the PFAs on lots less than 1 acre are prohibited (by statute) unless there are exceptions described by the BMAP
 - Exceptions –
 - OSTDS with nitrogen enhancement
 - Conventional OSTDS allowed if property is scheduled for a sewer project listed in BMAP
- Begins upon BMAP adoption (~July 2018)
- Important to abate future growth of OSTDS loads



Existing OSTDS

- Extent (“envelope”) of the remediation area for nitrogen enhancement policy under discussion
- Function of:
 - Potential for reducing load through enhancement
 - Total amount of load to be reduced
 - Relative contribution of nitrogen load from OSTDS
- Reduction credit per system:
 - Recharge and attenuation applied, based on location



Implementation

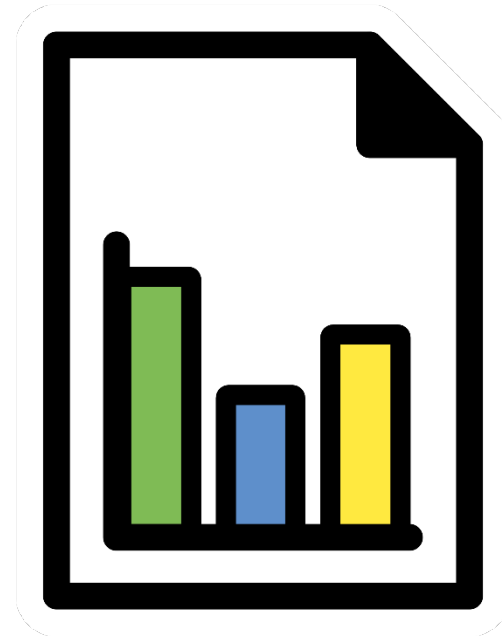
- Milestones for DEP and FDOH include:
 - Develop funding programs in cooperation with local governments for homeowners and individuals to remediate subject OSTDS
 - Update FDOH rules for OSTDS permitting and additional remediation options
 - Develop and disseminate education materials to identify the need, options, and funding for enhancement



Draft Approaches to Achieve Reductions and Restoration

Gemini Springs

- Reductions
- Gap Analysis

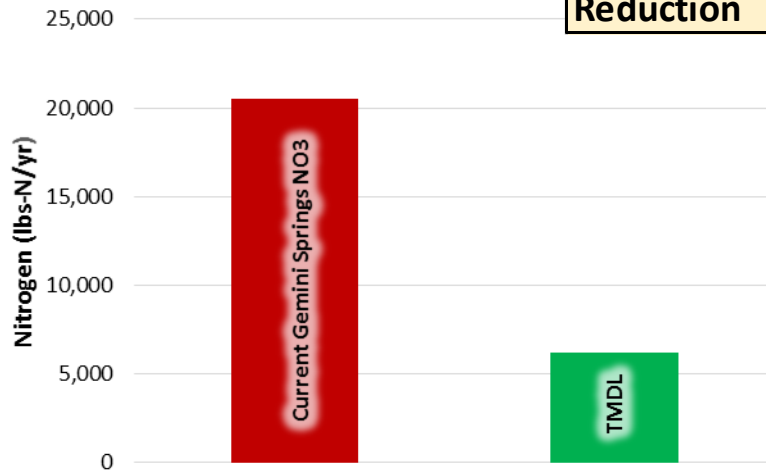




Gemini Springs Current Load Compared to the TMDL

Table 2. Total Reduction Needed to Meet the TMDL

	Nitrogen Loads (lb-N/yr)	Source
Total Load at Spring Vents	20,496	Upper 95% confidence interval - nitrate data and flow data from years 2011 to 2017 (1.2mg/L and 9 cfs)
TMDL Load	6,226	TMDL target is 0.35 mg/L and using the same flow data from years 2011 to 2017
Required Reduction	14,270	





Gemini Springs Reduction Milestones

- To achieve TMDL, BMAP implementation will be a 20-year process
- Gemini Springs BMAP will define nitrogen reduction milestones:
 - 30 % reduction within 5 years – 4,281 lb-N/yr
 - 50 % reduction within 10 years – 7,135 lb-N/yr
 - 20 % reduction within 15 years – 2,854 lb-N/yr
 - Total reduction – 14,270 lb-N/yr





Gemini Springs Reductions Gap

- Reductions Needed: 14,270 lb-N/yr
- Current Project List: 5,190 lb-N/yr
- **Gap/Additional Reductions Needed: 9,080 lb-N/yr**

$$\begin{array}{c} 2 > -3 \\ 0.999... = 1 \\ \pi \approx 3.14 \\ \sqrt{2} \\ 5(2 + 2) \\ 101_2 = 5_{10} \end{array} \quad \begin{array}{c} + \\ - \\ \times \\ \div \\ 5^2 \\ (1 - 2) + 3 \end{array}$$



Gemini Springs OSTDS Policy Envelope

$$A + B = C$$

Recharge	PFA lots less than 1 acre			PFA lots equal to or greater than 1 acre			PFA All Lot Sizes		
	Number of OSTDS	Load Reductions Through AWT	Load Reduction Through Sewering	Number of OSTDS	Load Reductions Through AWT	Load Reduction Through Sewering	Total OSTDS in PFA	Total Load Reduction Through AWT All Lots in PFA	Total Load Reduction Through Sewer All Lots in PFA
High	1889	10,009	14,628	391	2,072	3,028	2,280	12,080	17,656
Medium	38	112	163	3	9	13	41	121	176
Low	10	6	9	3	2	3	13	8	11
Total	1,937	10,126	14,800	397	2,082	3,043	2,334	12,209	17,843



Gemini Springs Options to Address Gap

- Additional OSTDS Remediation in PFA (B) = +2,000 to 3,000 lb-N/yr
- Additional OSTDS Remediation BMAP-wide (F) = +2,600 – 3,800 lb-N/yr
- Additional Urban Turfgrass Fertilizer (UTF) = ?
- Additional Sports Turfgrass Fertilizer (STF) = ?
- Advanced Agricultural Practices = +1,100 to 2,000 lb-N/yr





Gemini Springs BMAP Gap Analysis

Gap Analysis		
Nitrogen Source	Credits Based on Projects Submitted (lb-N/yr)	Description
OSTDS	0	Credits verified for stakeholder OSTDS projects (enhancement or sewer)
UTF (Urban Turfgrass)	1,979	DEP approved credits (up to 6%) for public education activities as well as credits identified for stakeholder stormwater projects
AD (Atmospheric Deposition)	0	No projects/reductions
FF (Farm Fertilizer)	88	15% BMP credit on FF load to groundwater, assuming 100% owner-implemented BMPs on all fertilized lands
STF (Sports Turfgrass)	243	6% BMP credit for sports fields and 10% BMP credit for golf courses on STF load to groundwater, assuming 100% BMP implementation on golf courses and sports fields
Livestock	6	10% BMP credit on load to groundwater, assuming 100% owner-implemented BMPs at all livestock facilities
WWTF (Wastewater Treatment Facility)	2,875	Achieved by BMAP WWTF policy if BMAP-wide (achieving 3 or 6 mg/L)
Total Credits	5,190	
Required Reduction	14,270	
Load Remaining	9,080	← GAP

How to address the remaining 9,080 lbs/yr?



How do we
address the
Gap?





Possible Approaches for Achieve Remaining Reduction

- OSTDS
- Wastewater Treatment Effluent Standards
- Urban and Sports Turfgrass
- Agriculture



Gemini Springs OSTDS

Estimated Reduction Credits for Additional OSTDS Enhancement OR Sewering

$$D + E = F$$

Recharge	Outside PFA lots less than 1 acre			Outside PFA lots equal to or greater than 1 acre			Total OSTDS Outside PFA	Total Load Reduction Through AWT All Lots Outside PFA	Reduction Through Sewer All Lots Outside PFA
	Number of OSTDS	Load Reductions Through AWT	Load Reduction Through Sewering	Number of OSTDS	Load Reductions Through AWT	Load Reduction Through Sewering			
High	259	1,372	2,006	5	26	39	264	1,399	2,044
Medium	33	97	142	9	26	39	42	124	181
Low	1338	788	1,151	548	323	472	1,886	1,110	1,623
Total	1,630	2,257	3,299	562	376	549	2,192	2,633	3,848



Gemini Springs Wastewater Treatment Facilities (WWTFs)

Table 4. DEP WWTF Policy in BMAP

Disposal Volume (gpd)	Nitrogen Concentration Limits for RIBs and Absorption Fields (mg/L)	Nitrogen Concentration Limits for All Other Land Disposal Methods (mg/L)
Greater Than 100,000	3	3
20,000 to 100,000	3	6
Less Than 20,000	6	6

Policy change would result in a reduction of approximately 2,875 lb-N/yr



Urban Turfgrass

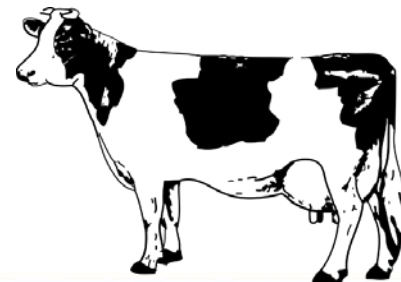
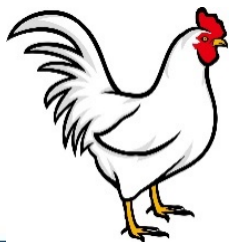
- *Urban/Sports Turfgrass Fertilizer (UTF)* –
 - Calculated the estimated reductions to groundwater for source control measures:
 - Florida Yards & Neighborhoods Program
 - Local ordinance (fertilizer, local pet waste ordinance, irrigation ordinance; local Florida-friendly (low irrigation and fertilizer) landscape ordinance)
 - Entities have the option to collect and provide monitoring data to quantify reduction credits for additional measures
 - e.g., Seminole County
 - Fertilizer Educational Outreach
 - Interconnected Online Calculators
 - Quantifying Long Term Impact





Agriculture

- *Farm Fertilizer (FF), Livestock Waste (LW), and Nurseries*
 - Calculated the reductions to groundwater from 100% owner-implemented best management practices (BMPs)
 - Calculated the reductions to groundwater from existing additional cost-share BMPs and special projects
 - Additional credits could be achieved through better documentation of reductions achieved through BMP implementation or implementation of advanced cost-share BMPs, such as precision irrigation, soil moisture probes, cover crops, and conservation easements





Gemini Springs Ag Options to Reduce Remaining Load

Estimated Reduction Credits for Advanced Agricultural Practices		
Action	Estimated Reduction Credit (lb-N/yr) Range	
Precision Fertilizer	17	9
Precision Irrigation	0	0
Soil Moisture Probes	51	29
Cover Crops	2,055	1,142
Total Potential Reduction	2,124	1,180





Gemini Springs Water Quality Monitoring

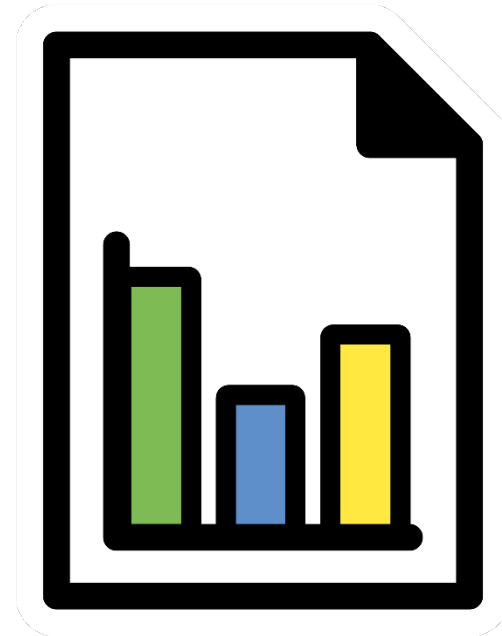
- Water quality monitoring –
 - Surface water & groundwater monitoring network
- Update water quality stations in the BMAP monitoring network and biological monitoring information
 - Frequency
 - Parameters



Draft Approaches to Achieve Reductions and Restoration

DeLeon Spring

- Reductions
- Gap Analysis





DeLeon Spring Current Load Compared to the TMDL

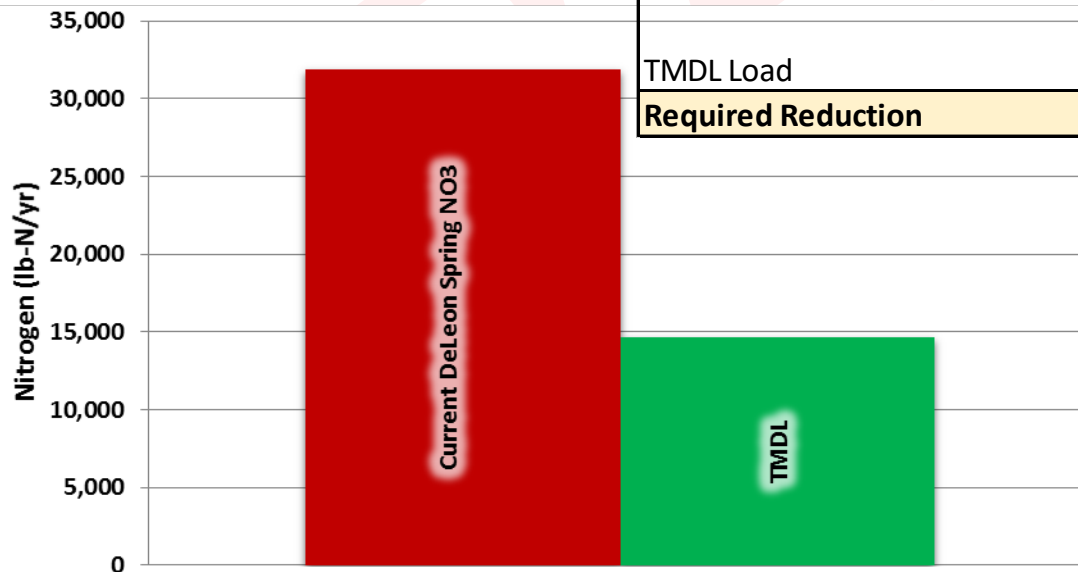


Table 2. Total Reduction Needed to Meet the TMDL

	Loads (lb-N/yr)	Source
Total Load at Spring Vents	31,852	Upper 95% confidence interval - nitrate data and flow data from years 2011 to 2017 (0.61 mg/L and 21.3 cfs)
TMDL Load	14,657	TMDL target is 0.35 mg/L and using the same flow data from years 2011 to 2017
Required Reduction	17,195	



DeLeon Spring Reduction Milestones

- To achieve TMDL, BMAP implementation will be a 20-year process
- DeLeon Spring BMAP will define nitrogen reduction milestones:
 - 30 % reduction within 5 years – 5,159 lb-N/yr
 - 50 % reduction within 10 years – 8,598 lb-N/yr
 - 20 % reduction within 15 years – 3,439 lb-N/yr
 - Total reduction – 17,195 lb-N/yr





DeLeon Spring Reductions Gap

- Reductions Needed: 17,195 lb-N/yr
- Current Project List: 7,891 lb-N/yr
- **Gap/Additional Reductions Needed: 9,304 lb-N/yr**

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DeLeon Spring OSTDS Policy Envelope

$$A + B = C$$

Recharge	PFA lots less than 1 acre			PFA lots equal to or greater than 1 acre			Total # of OSTDS in PFA by Recharge Area	Total Load Reduction Through AWT All Lots in PFA	Total Load Reduction Through Sewer All Lots in PFA
	Number of OSTDS	Load Reductions Through AWT	Load Reduction Through Sewering	Number of OSTDS	Load Reductions Through AWT	Load Reduction Through Sewering			
High	2,028	10,531	15,392	946	4,913	7,180	2,974	15,444	22,572
Medium	436	1,258	1,838	387	1,116	1,632	823	2,374	3,470
Low	13	8	11	82	47	69	95	55	80
Total	2,477	11,797	17,241	1,415	6,076	8,881	3,892	17,873	26,122



DeLeon Spring Options to Address Gap

- Additional OSTDS Remediation in PFA (B) = +6,000 to 8,800 lb-N/yr
- Additional OSTDS Remediation BMAP-wide (F) = +2,500 – 3,700 lb-N/yr
- Additional Urban Turfgrass Fertilizer (UTF) = ?
- Additional Sports Turfgrass Fertilizer (STF) = ?
- Advanced Agricultural Practices = +11,500 to 20,800 lb-N/yr





DeLeon Spring BMAP Gap Analysis

Gap Analysis		
Nitrogen Source	Credits Based on Projects Submitted (lb-N/yr)	Description
OSTDS	0	Credits verified for stakeholder OSTDS projects (enhancement or sewer)
UTF (Urban Turfgrass)	1,360	DEP approved credits (up to 6%) for public education activities as well as credits identified for stakeholder stormwater projects
AD (Atmospheric Deposition)	0	No projects/reductions
FF (Farm Fertilizer)	4,258	15% BMP credit on FF load to groundwater, assuming 100% owner-implemented BMPs on all fertilized lands
STF (Sports Turfgrass)	13	6% BMP credit for sports fields and 10% BMP credit for golf courses on STF load to groundwater, assuming 100% BMP implementation on golf courses and sports fields
Livestock	1,726	10% BMP credit on load to groundwater, assuming 100% owner-implemented BMPs at all livestock facilities
WWTF (Wastewater Treatment Facility)	534	Current and verified WWTF projects
Total Credits	7,891	
Required Reduction	17,195	
Load Remaining	9,304	← GAP

How to address the remaining 9,304 lbs/yr?



How do we
address the
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Possible Approaches for Achieve Remaining Reduction

- OSTDS
- Wastewater Treatment Effluent Standards
- Urban and Sports Turfgrass
- Agriculture



DeLeon Spring OSTDS

Estimated Reduction Credits for Additional OSTDS Enhancement OR Sewering

D + E = F

Outside the PFA (In the springshed) lots less than 1 acre			Outside the PFA (In the springshed) lots greater than 1 acre			Total # of OSTDS Outside PFA by Recharge Area	Total Load Reduction Through AWT All Lots Outside PFA	Total Load Reduction Through Sewer All Lots Outside PFA
Number of OSTDS	Load Reductions Through AWT	Load Reduction Through Sewering	Number of OSTDS	Load Reduction s Through AWT	Load Reduction Through Sewering			
64	332	486	190	987	1,442	254	1,319	1,928
101	291	426	303	874	1,278	404	1,166	1,703
1	1	1	83	48	70	84	48	71
166	624	912	576	1,909	2,790	742	2,533	3,702



DeLeon Spring Wastewater Treatment Facilities (WWTFs)

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Greater Than 100,000	3	3
20,000 to 100,000	3	6
Less Than 20,000	6	6

Policy change would result in a reduction of approximately 534 lb-N/yr



Urban Turfgrass

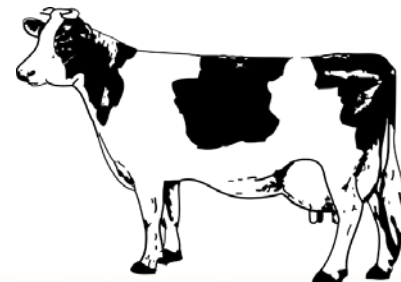
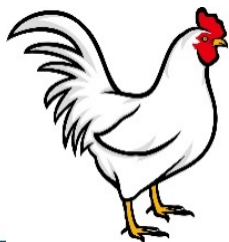
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DeLeon Spring Ag Options to Reduce Remaining Load

Estimated Reduction Credits for Advanced Agricultural Practices

Action	Estimated Reduction Credit (lb-N/yr) Range	
Precision Fertilizer	167	93
Precision Irrigation	175	97
Soil Moisture Probes	13,689	7,605
Cover Crops	6,819	3,788
Total Potential Reduction	20,851	11,584





DeLeon Water Quality Monitoring

- Water quality monitoring –
 - Surface water & groundwater monitoring network
- Update water quality stations in the BMAP monitoring network and biological monitoring information
 - Frequency
 - Parameters



Wrap Up

- Action Items
- Next steps
 - Draft revised BMAP document
 - Draft BMAP document out for public review
 - Public meeting on the draft BMAP document
(tentative late April/early May)
- Other comments/announcements



Thank you!