WQEA Implementation Issues Requiring Rule Clarity

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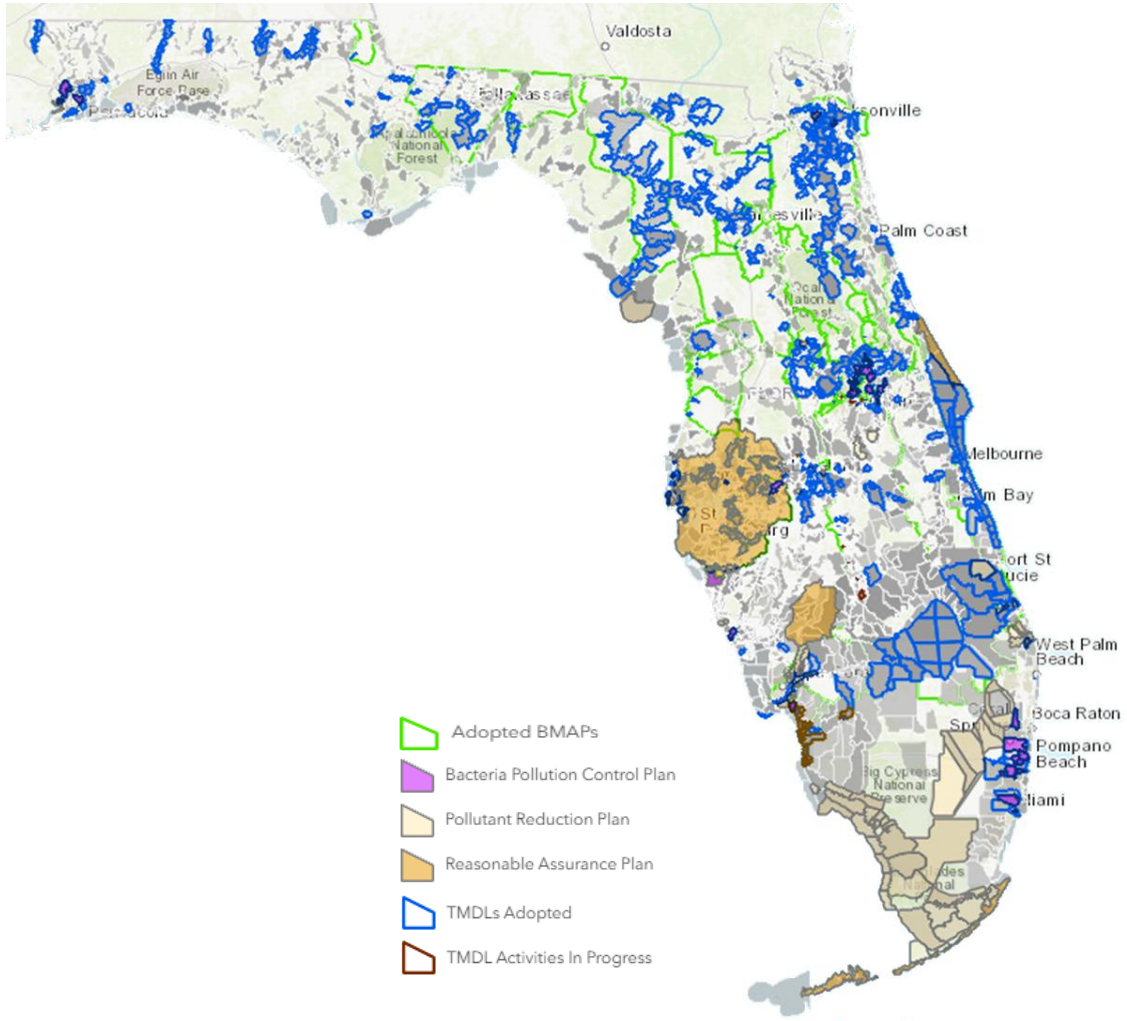
Restoring a resilient earth for a modern world

Meeting Agenda

- Credit Release
- Credit Calculations
- LVF Discussion
- WQEA Project Concepts
  - Application Contents
  - Calculation Assumptions
  - Project Benefits
  - Crediting

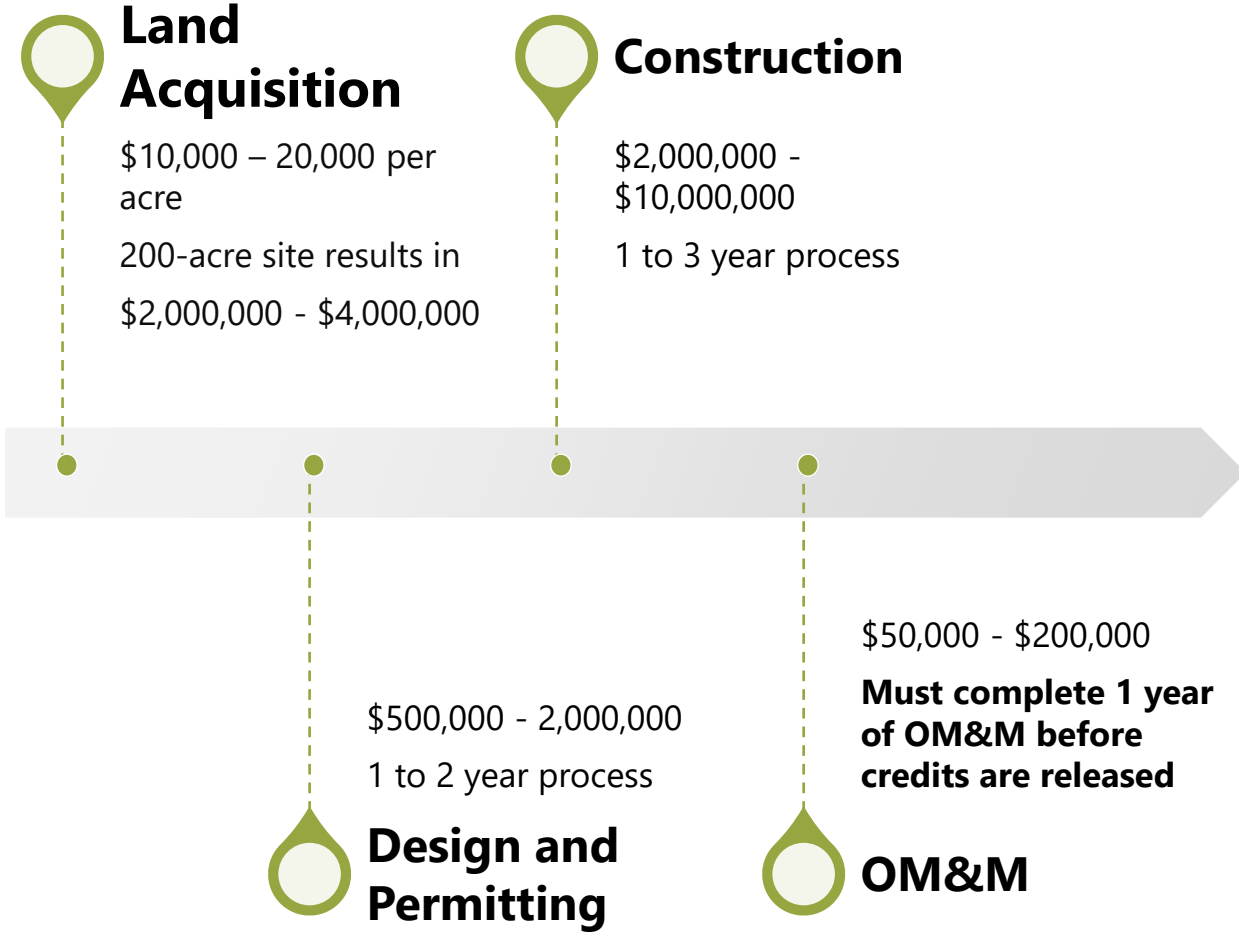


Source: FDEP

Credit Release

WQEA Financial & Implementation Risk

- Significant Upfront Capital Exposure
  - $4.5M to 16.2M creates substantial capital exposure before the project begins to recover costs
- Long Cost-Recovery Period
  - 3-5 years to **start selling credits**
- Regulatory & Market Uncertainty
  - Change in land use
  - Service Area requirements
  - Stormwater regulations
  - Credit values



Proposed Credit Release Schedule

Permit Issued

Construction commences

Financial Assurances

Construction Complete

As-built received and submitted to the agency

Begin monitoring

25% Release

Year 2 of monitoring

Submit 2nd-Year Monitoring Report

Additional 25% Release

50% Cumulative release

Year 4 of Monitoring

Submit 4th-Year Monitoring Report

Reduced Monitoring requirements

100% Cumulative Release

5th to 10th Year

Annual sampling event

Use 5yr moving average to prove continued performance

10th Year and Beyond

Long term stewardship

No more monitoring required

Continued maintenance

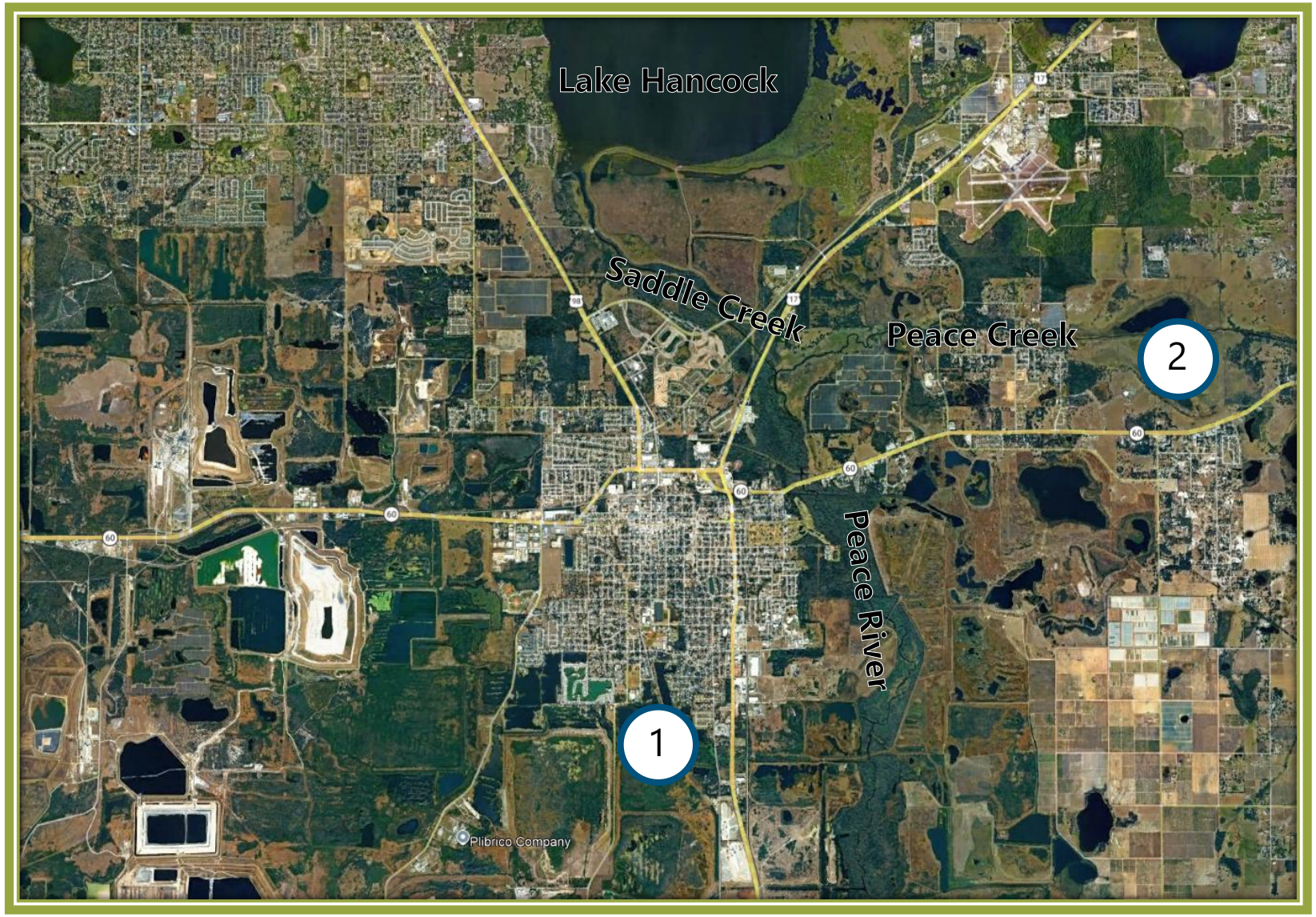
WQEA Site Conditions

WQEA Application Contents

WQEA location overview (regional & vicinity maps, aerial, legal access, legal description)
Existing site conditions (soils, topography, hydrology, vegetation, watershed context)
Adjacent lands & land use context (current + planned uses, special designations)
Geotechnical conditions (karst-sensitive areas, if applicable)
Owner disclosures (material facts affecting site use)
Long-term rainfall data
Projected inflows (water quality/quantity across climate variability)
Site factors & BMP performance (treatment types and proven reduction rates)
Expected ecological & hydrological benefits to watershed
Modeling approach (tools, inputs, and results)
Estimated annual pollutant and nutrient load reductions
Implementation plan (construction drawings, schedule, planting, impact avoidance)
Monitoring & verification plan (performance and success criteria)
Long-term management plan (maintenance, vegetation, invasives, fire, access control)
Proof of property interest (legal/equitable control)
Financial assurance documentation (draft)
Conservation easement documentation (draft)

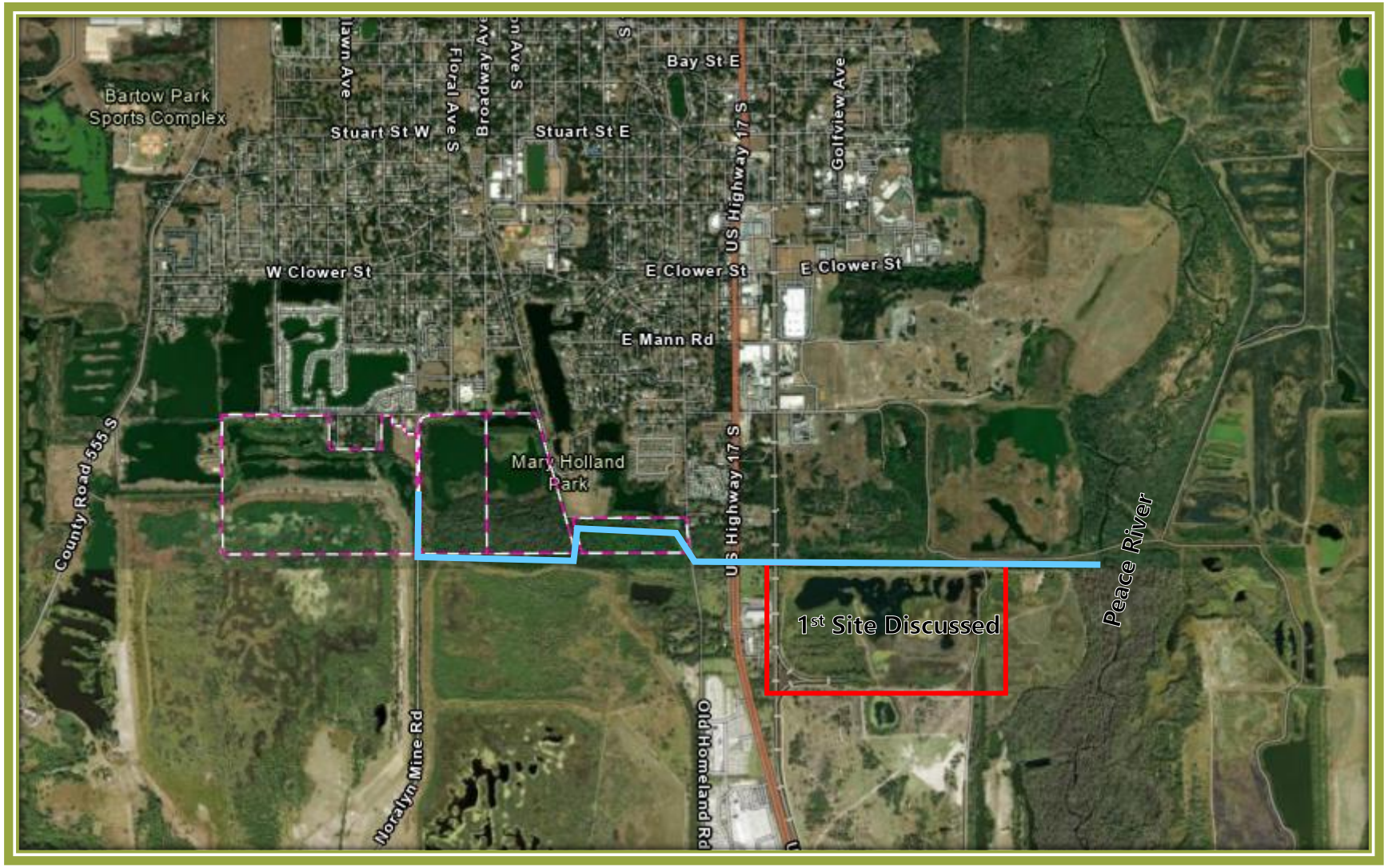
Rule 62-332.550,FAC

Proposed Project Locations

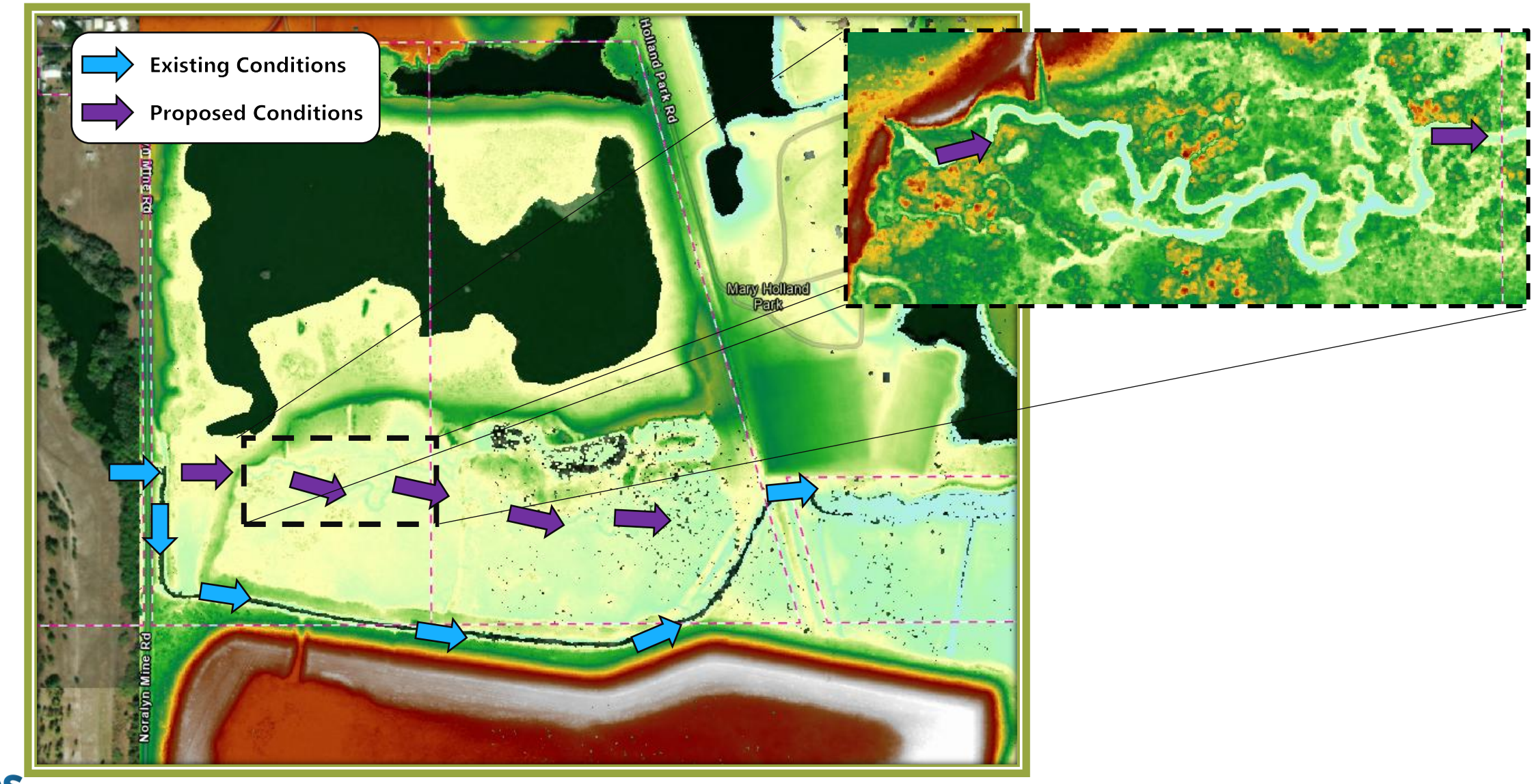


1. Stream restoration site
2. Pasture conversion site

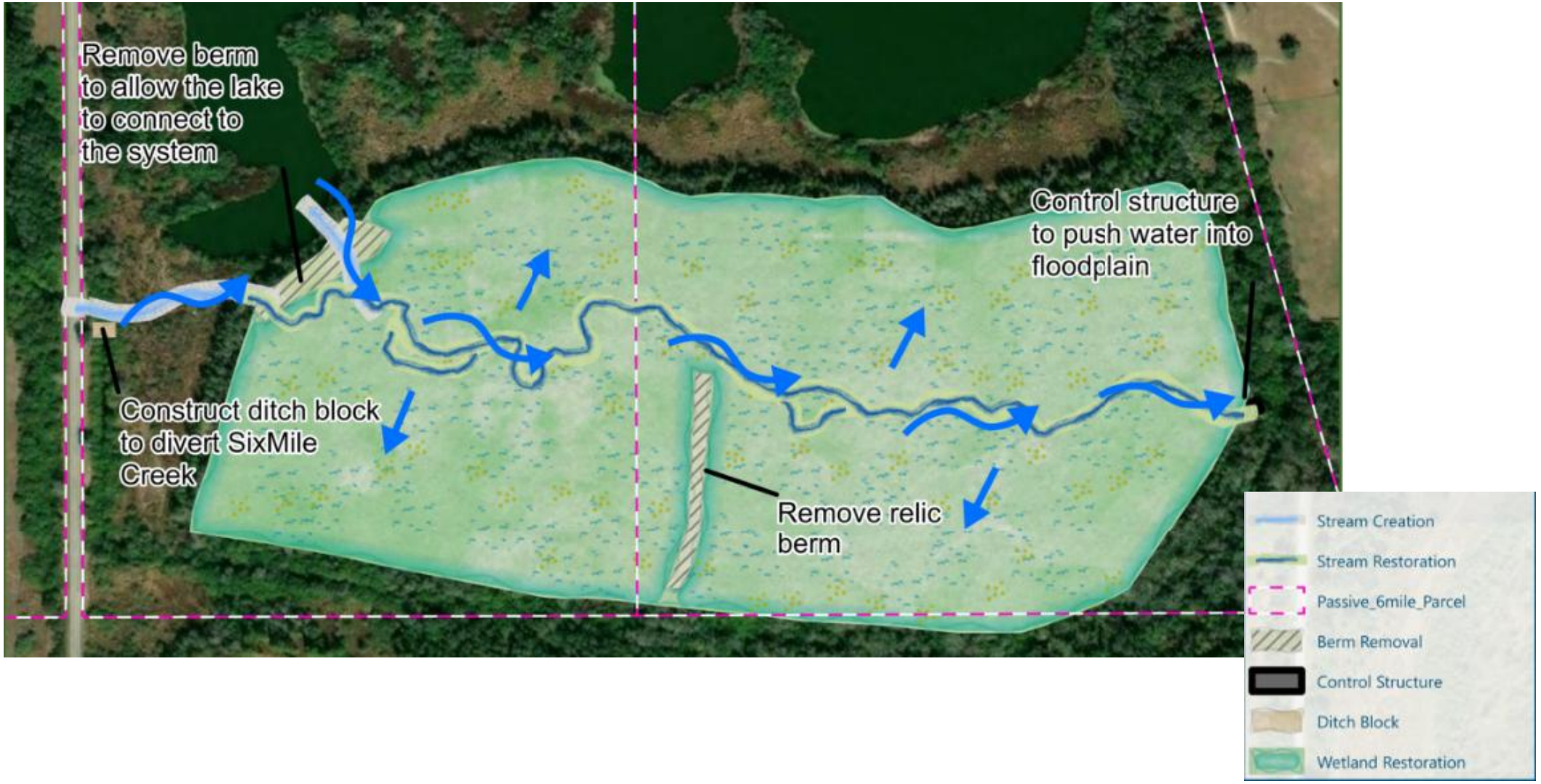
Stream Restoration – Existing Conditions



Stream Restoration –Existing LiDAR



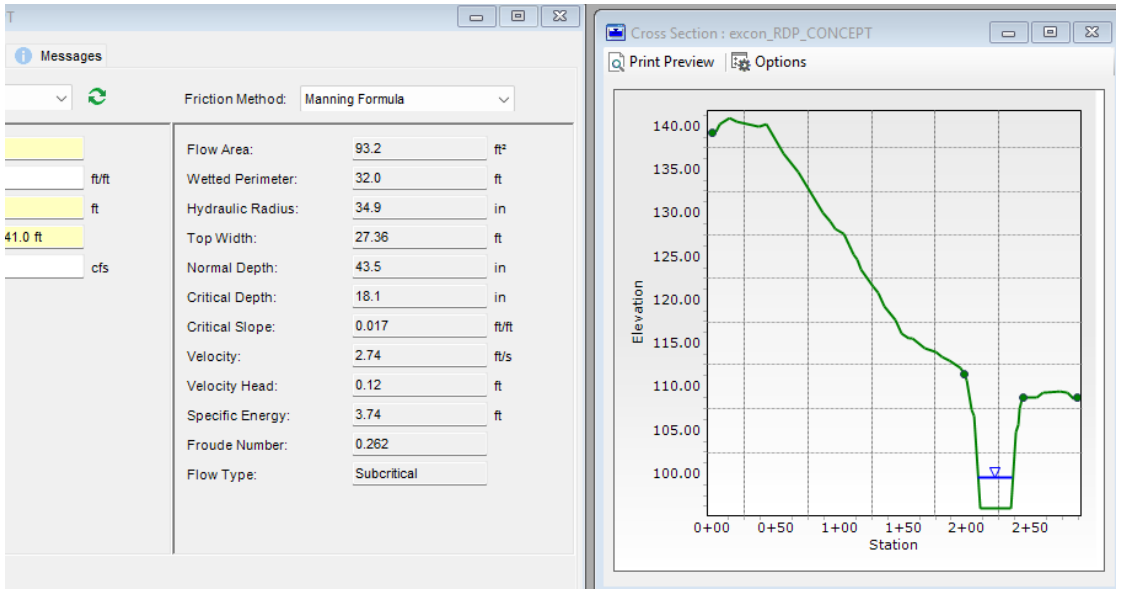
Stream Restoration –Proposed Conditions

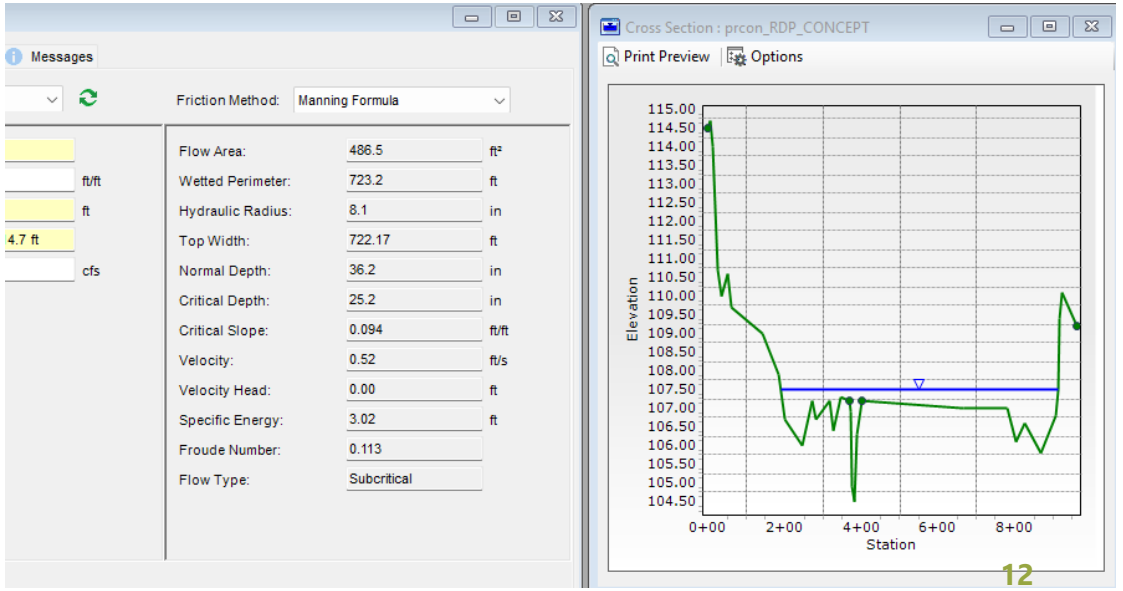


Stream Restoration – Load Reduction Calculations

- **Applying EPA Stream Restoration Protocol 3: Floodplain Reconnection**

1. Define Restoration Area
   - Delineate the restored stream and reconnected floodplain treatment area
   - Determine the drainage area contributing runoff to the project
2. Determine Floodplain Access
   - Quantify peak flows to project site via B17C statistical analysis
   - Establish pre and post-stream restoration stream/floodplain elevations
   - Calculate how much additional runoff accesses the floodplain after restoration via development of a flow duration curve





Stream Restoration – Reduction Calculations, cont'd

3. Calculate Treatable Flow (Proposed Conditions)

$$= 100 - Channel\ Flow\ (78.82\%) + Base\ Flow\ (.66\%) - (Area\ under\ Cover\ (100) - Floodplain\ Flow\ (99.6) = \mathbf{21.44\%}$$

4. Calculate Annual Loading

- Annual Average Discharge: 18.16 CFS

$$TP\ (\frac{lb}{yr}) = TP\ Loading\ (1.9\ \frac{mg}{L}) * Annual\ Avg\ Discharge(18.16\ CFS) * 19{,}689{,}762.4(conversion\ factor) = \mathbf{135875.1}\frac{\mathbf{lb}}{\mathbf{yr}}$$

$$TN\ (\frac{lb}{yr}) = TN\ Loading\ (3.8\ \frac{mg}{L}) * Annual\ Avg\ Discharge(18.16\ CFS) * 19{,}689{,}762.4(conversion\ factor) = \mathbf{67937.6}\frac{\mathbf{lb}}{\mathbf{yr}}$$

5. Calculate Annualized Credits Available

$$TP(\frac{lb}{yr}) = TP\ Loading\ (\mathbf{135875.1}\frac{\mathbf{lb}}{\mathbf{yr}}) * Effectiveness\ (Preliminary\ 30\%) * Percent\ Treatable\ Flow\ (\mathbf{21.44\%}) = \mathbf{4{,}370}\frac{\mathbf{lb}}{\mathbf{yr}}$$

$$TN(\frac{lb}{yr}) = TN\ Loading\ (\mathbf{67937.6}\frac{\mathbf{lb}}{\mathbf{yr}}) * Effectiveness\ (Preliminary\ 30\%) * Percent\ Treatable\ Flow\ (\mathbf{21.44\%}) = \mathbf{8{,}740}\frac{\mathbf{lb}}{\mathbf{yr}}$$

$* Percent\ Effectiveness\ is\ based\ on\ a\ ratio\ between\ Precondition\ trapping\ volume\ (ac-ft)\ and\ Annualized\ Sediment\ Volume\ Delivered\ (ac-ft)$

Stream Restoration – Monitoring Program

Baseline Monitoring

- Establish 1-2 yr baseline monitoring to capture two consecutive wet/dry seasons
- Nutrient and physical parameters
- Flow measurements paired with continuous downstream USGS gage
- Storm event and baseflow sampling

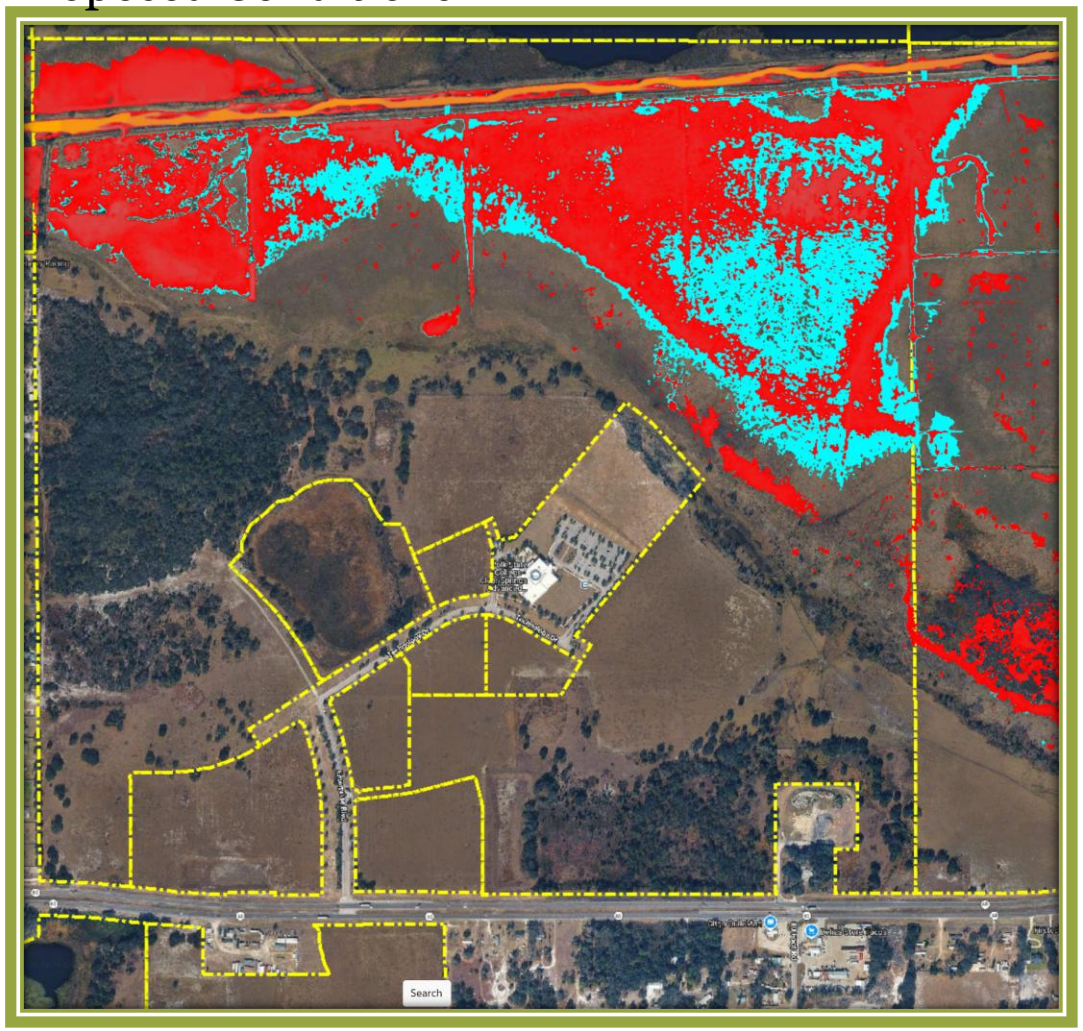
Annual Performance Monitoring

- Paired upstream / downstream reach stations for concentrations and flow
- Floodplain stage/inundation
- Vegetation establishment, native cover, exotic/nuisance control

Pasture Conversion

Existing Conditions

Proposed Conditions



Pasture Conversion – Reduction Calculations

Existing Condition Information

- Restored Area – 500 acres
- **Pre-Development Land Use – Pasture**
- DCIA% - 0%
- Soils CN – 80
- Annual Rainfall – 52

Proposed Condition Information

- Restored Area – 500 acres
- **Post-Development Land Use – Wet Flatwoods**
- DCIA% - 0%
- Soils CN – 80
- Annual Rainfall – 52

ZONE 2
Mean Annual Runoff Coefficients (ROC Value) as a Function of DCIA Percentage and Non-DCIA Curve Number

NDCIA CN	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
	0.002	0.043	0.083	0.123	0.164	0.204	0.244	0.285	0.325	0.366	0.406	0.446	0.487	0.527	0.567	0.608	0.648	0.688	0.729	0.769	0.809
35	0.004	0.044	0.085	0.125	0.165	0.205	0.246	0.286	0.326	0.366	0.407	0.447	0.487	0.528	0.568	0.608	0.648	0.689	0.729	0.769	0.809
40	0.007	0.047	0.087	0.127	0.167	0.207	0.248	0.288	0.328	0.368	0.408	0.448	0.488	0.528	0.569	0.609	0.649	0.689	0.729	0.769	0.809
45	0.010	0.050	0.090	0.130	0.170	0.210	0.250	0.290	0.330	0.370	0.410	0.450	0.490	0.530	0.570	0.610	0.650	0.690	0.729	0.769	0.809
50	0.015	0.055	0.095	0.134	0.174	0.214	0.254	0.293	0.333	0.373	0.412	0.452	0.492	0.531	0.571	0.611	0.651	0.690	0.730	0.770	0.809
55	0.022	0.061	0.101	0.140	0.179	0.219	0.258	0.298	0.337	0.376	0.416	0.455	0.494	0.534	0.573	0.613	0.652	0.691	0.731	0.770	0.809
60	0.030	0.069	0.108	0.147	0.186	0.225	0.264	0.303	0.342	0.381	0.420	0.459	0.498	0.537	0.576	0.615	0.654	0.693	0.731	0.770	0.809
65	0.042	0.080	0.119	0.157	0.195	0.234	0.272	0.311	0.349	0.387	0.426	0.464	0.502	0.541	0.579	0.618	0.656	0.694	0.733	0.771	0.809
70	0.057	0.095	0.133	0.170	0.208	0.245	0.283	0.321	0.358	0.396	0.433	0.471	0.509	0.546	0.584	0.621	0.659	0.697	0.734	0.772	0.809
75	0.079	0.116	0.152	0.189	0.225	0.262	0.298	0.335	0.371	0.408	0.444	0.481	0.517	0.554	0.590	0.627	0.663	0.700	0.736	0.773	0.809
80	0.111	0.146	0.181	0.216	0.251	0.285	0.320	0.355	0.390	0.425	0.460	0.495	0.530	0.565	0.600	0.635	0.670	0.705	0.740	0.774	0.809
85	0.160	0.192	0.225	0.257	0.290	0.322	0.355	0.387	0.420	0.452	0.485	0.517	0.550	0.582	0.614	0.647	0.679	0.712	0.744	0.777	0.809
90	0.242	0.270	0.299	0.327	0.355	0.384	0.412	0.440	0.469	0.497	0.526	0.554	0.582	0.611	0.639	0.667	0.696	0.724	0.753	0.781	0.809
95	0.404	0.424	0.444	0.464	0.485	0.505	0.525	0.546	0.566	0.586	0.606	0.627	0.647	0.667	0.688	0.708	0.728	0.749	0.769	0.789	0.809
98	0.595	0.605	0.616	0.627	0.638	0.648	0.659	0.670	0.680	0.691	0.702	0.713	0.723	0.734	0.745	0.756	0.766	0.777	0.788	0.799	0.809

Pasture Conversion – Reduction Calculations cont'd

Existing Condition Information

- **Pre-Development Land Use – Pasture**
- EMC – TN (3.03 mg/L) and TP (0.593 mg/L)
- Annual Loading – TN (1,976 lb/yr) and TP (387 lb/yr)

Proposed Condition Information

- **Post-Development Land Use – Wet Flatwoods**
- EMC – TN (1.213 mg/L) and TP (0.021 mg/L)
- Annual Loading – TN (791 lb/yr) and TP (13 lb/yr)

Crediting Available

- TN = 1976 lb – 791 lb = **1,184 lb**
- TP = 387 lb – 13 lb = **373 lb**

Table 9.2 Standardized Statewide Stormwater Nutrient EMC Values

Land Use Category	Total N (mg/l)	Total P (mg/l)
Low Density Residential	1.65	0.270
Single Family	1.77	0.327
Multi-Family	1.84	0.520
Low Intensity Commercial	0.93	0.19
High Intensity Commercial	2.40	0.345
Light Industrial	1.20	0.260
Highway	1.25	0.173
Dry Prairie	2.025	0.184
Marl Prairie	0.684	0.012
Mesic Flatwoods	1.087	0.043
Ruderal/Upland Pine	1.694	0.162
Scrubby Flatwoods	1.155	0.027
Upland Hardwood	1.042	0.346
Upland Mixed Forest	0.696	1.166
Wet Flatwoods	1.213	0.021
Wet Prairie	1.095	0.015
Xeric Scrub	1.596	0.156
Rangeland/parkland	1.150	0.055
General Agricultural	2.29	0.381
Pasture	3.03	0.593
Citrus	2.11	0.180
Row Crops	2.50	0.577

$$Load = Area\ x\ Annual\ Rainfall\ x\ \ Annual\ Runoff\ x\ EMC\ x\ 2.72$$

2.72 is a conversion factor

Pasture Conversion – Proposed Monitoring

Baseline (1 year) and Annual Post-construction Monitoring (5 years) Monitoring Plan

Category	Parameter	Method
Hydrology ▲	Water level, hydroperiod, depth, duration, frequency	Continuous loggers and staff gages
Vegetation ⋮	Percent native cover and exotic/nuisance cover	Fixed transects and vegetation plots
Vegetation ⋮	Planted stem survival and density	Plot-based stem counts
Wildlife ⬚	Protected species presence/use	Observation logs and incidental surveys

* Throughout lifespan of WQEA, proposed FAC 62-332.800

LVF Discussion

WQEA CREDITING FRAMEWORK

Locational Valuation Factor Approach

LVF uses numerical models / analytical tools to estimate pollutant uptake over distance and attenuation between **WQEA** and **Credit Purchaser's** projects

$LVF = TF \times VF$

TF = Transport Factor

VF = Variability Factor

Each factor adjusts crediting to reflect where a load reduction occurs relative to the impaired waterbody

Based on numerical models or other analytical tools provided by WQEA permit application

Transport Factor (TF)

$$TF = \frac{1}{1 - Atten_s}$$

Accounts for **attenuation** of pollutants between **hydrologically connected** points:

$Atten_s$ = Attenuation between WQEA & Creditor's discharge points with Value range 0 - 1

- If WQEA's discharge point is downstream of Credit Purchaser's project, TF = min 2

Variability Factor (VF)

$$VF = \frac{95^{th} \text{ percentile concentration}}{\text{geometric mean concentration}}$$

Accounts for **concentration variability** within waterbody for pollutant being offset.

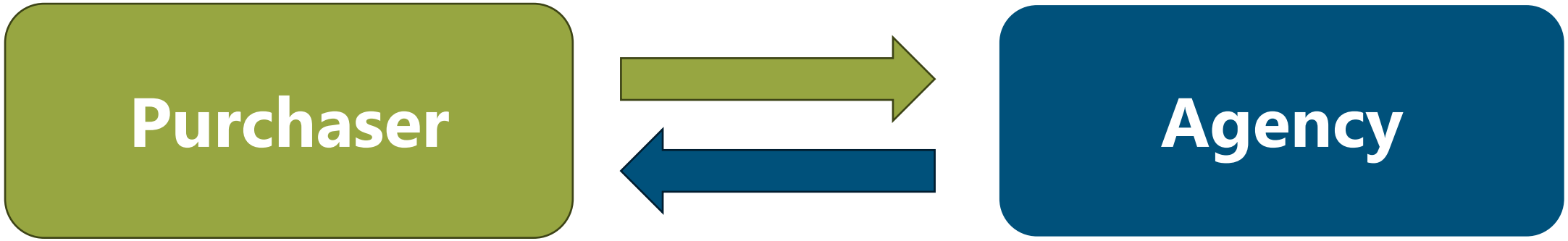
- If > 20 values in record, 95th percentile = maximum result

Enhancement Credits Required = Annual load reduction × **LVF**

Rule 62-332.500(6)(c),FAC

Attenuation Factor

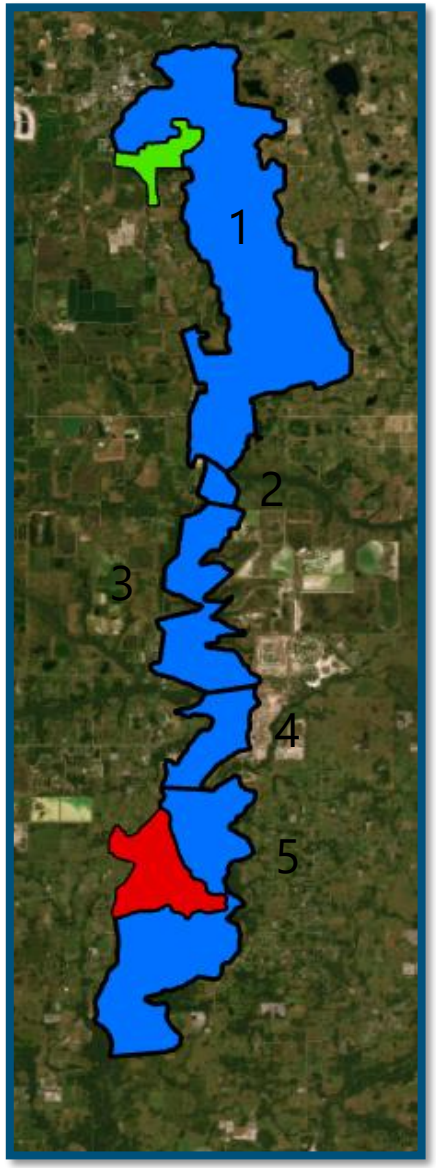
- The rule is currently unclear on how to handle attenuation
- BMAPs use extensive modeling effort to determine these factors for crediting projects
- Each BMAP has its own model, and each model is different
  - SWIL, HSPF, etc.
- Currently, the BMAP calculates the attenuation factor by engaging an outside consultant to run the respective model
- In areas where BMAPs do not exist, there is no model currently



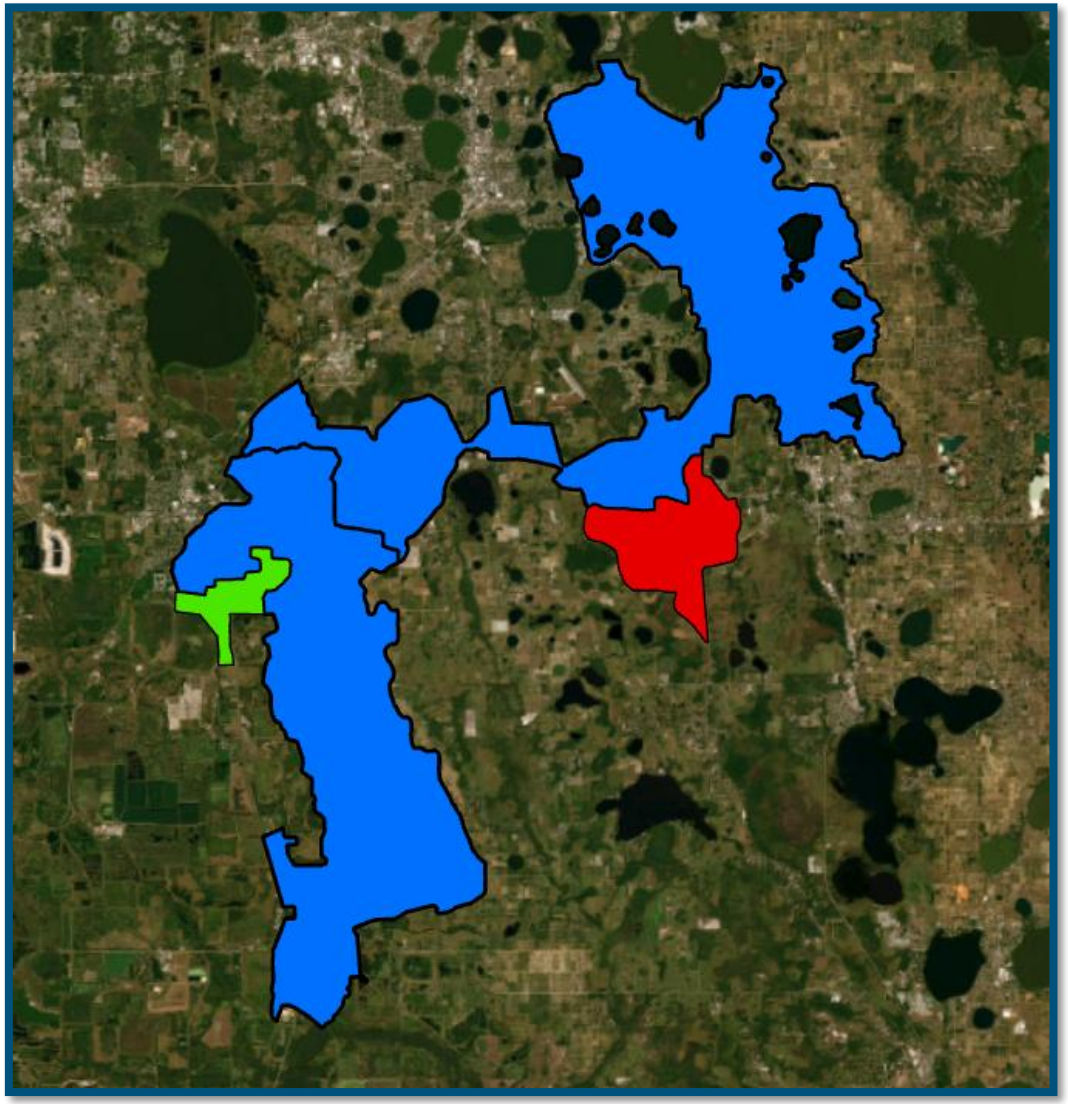
Atten Factor Approach

- Case-by-case review
- Use WBIDs (HUC12)
  - Each WBID 2%
  - Each Lake 20%
  - Coastal/Estuaries 50%
- WQEA is 5 WBIDs upstream
  - Atten = 5x2% =10%
  - **TF = 1.11**
- WQEA is 2 WBIDs downstream
  - Atten = 2X2% =4%
  - TF = 1.04
  - **Min is 2**

WQEA Upstream Example



WQEA Downstream Example



Questions