J.M. Larson, Inc.
Environmental Improvements Project

October 28, 2025

Prepared by:

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Section 1 Introduction

Royal Consulting Services, Inc. (RCS), as an authorized agent for J.M. Larson, Inc. (J.M.), is pleased to submit this unsolicited proposal on their behalf. RCS and J.M. have teamed together to design and construct an environmental improvement project on J.M.'s Barn 3 Confined Animal Feeding Operation (CAFO) in Okeechobee County, Florida. Barn 3 is permitted under Florida Department of Environment Protection (FDEP) permit number FLA139254. As shown on **Figure 1**, runoff from the site flows to Gomez Creek, which is within the St. Lucie River Watershed (South Florida Water Management District (SFWMD), 2024).

Section 2 Project Description and Purpose

The dairy maintains an annual average of 2,200 1,250-lb lactating dairy cows housed in four freestall barns. The support herd, including dry cows and springers, are managed on 149 acres of pastures.

The flushed wastewater from the freestall barns is conveyed via a concrete flume to the gravity sand separator lane (sand lane). The flushed wastewater is slowed through the sand lane allowing the sand to settle. An anaerobic digester was constructed onsite in 2023 and has been integrated into the waste management system (WMS). Wastewater flows from the sand lanes into the receiving pit and is pumped into a mechanical solids screen separator. The solids are separated onto the solids handling slab for use on the field or to be shipped offsite. After traveling through the digester, liquids will be sent to waste storage pond (WSP) 1. Effluent is then routed to WSP 2 and WSP 3 for additional retention and solids settling. The WSPs provide approximately 149 ac-ft of storage, sufficient for retaining the 25-yr/24-hr storm. Biological reduction of nutrients will also take place in these ponds through anaerobic processes. The treated wastewater is then available for reuse at WSP 3. Wastewater from WSP 3 provides irrigation to the onsite sprayfields SF-North (88.7 acres), SF-South (97.7 acres), and SF-East (145.0 acres) for a total of 331.4 acre of sprayfields. To maintain conservative calculations, it was assumed the digester does not reduce the nutrient content of the wastewater effluent.

2.1 Project Goals

The goal of the project is to improve nutrient management and reduce runoff impacts to the St. Lucie Watershed through infrastructure upgrades and Best Management Practices (BMPs) implementation. Specifically, total nitrogen (TN) and total phosphorus (TP) runoff from the property will be reduced by transitioning the support herd from a pasture-based to a controlled-environment system. Utilizing a freestall barn with a dedicated WMS reduces organic matter from being deposited in open fields, instead containing and directing it through a conveyance system through which it will be treated by engineered biological and physical processes. The treated material will then be distributed through an expanded irrigation system and applied at agronomic rates.

2.2 Program Alignment

The proposed improvements align directly with SFWMD priorities for agricultural water quality enhancement. By moving manure management from open-lot to controlled confinement, recycling bedding materials, and expanding effluent reuse capacity, the project supports the agencies' goals for:

- Reducing nonpoint source nutrient loading to priority waterbodies;
- Promoting best available technologies for manure and wastewater management;

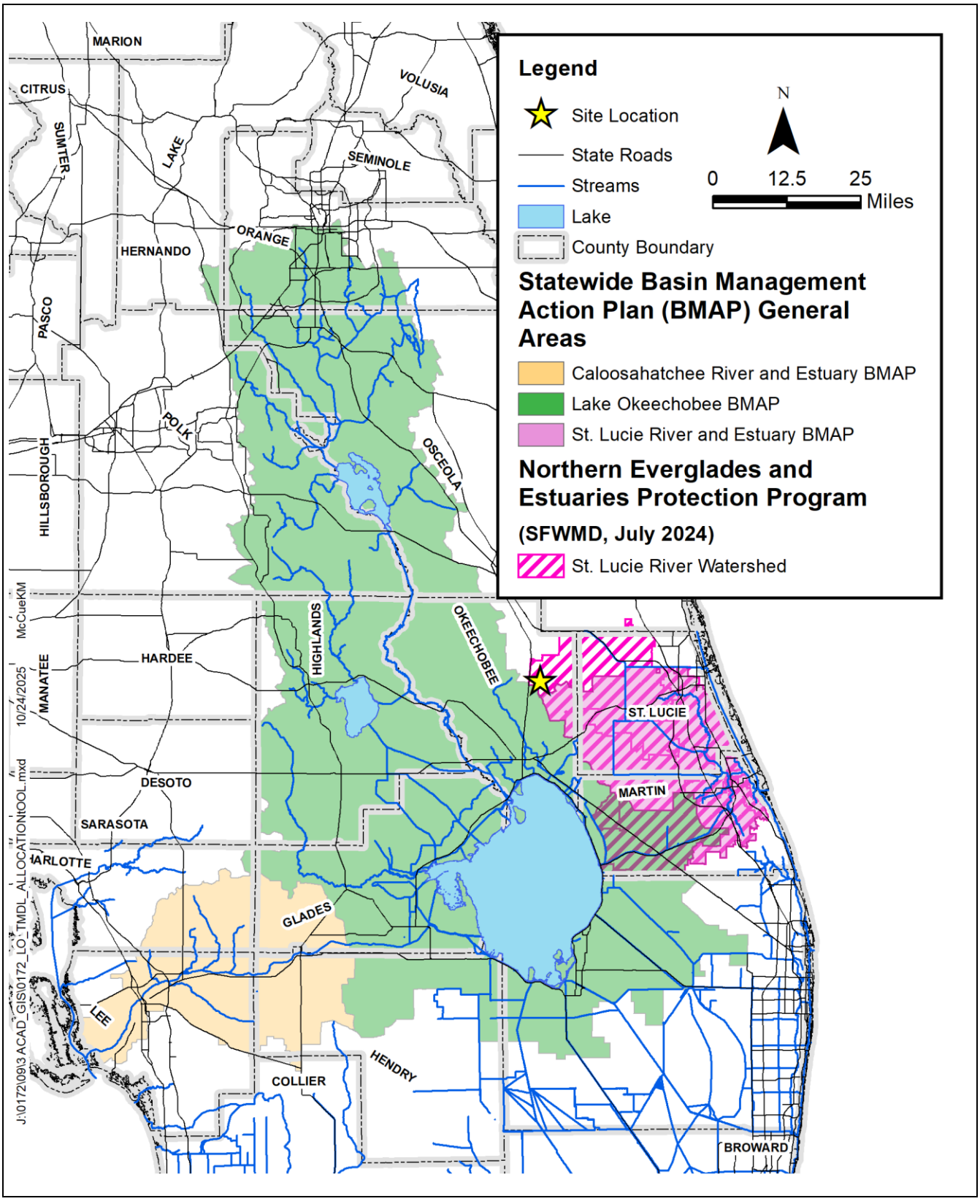

Figure 1 Project Location

- Enhancing resilience and sustainability of agricultural operations within the St. Lucie Basin; and
- Demonstrating practical, scalable solutions for regional nutrient reduction.

Section 3 Design Components

The proposed environmental improvement project (see **Figure 2**) includes the following modernization measures:

- Move cows out of High Intensity Area by constructing a 550-cow freestall barn with advanced manure handling systems.
- Expanding the existing barn to accommodate 120 special-needs cows.
- Installing a 25,000-gallon flush tank, flush/fresh water supply mains, and cow comfort fans.
- Development of a 75-acre center pivot irrigation system with supporting PVC mains and diesel generator.
- Sand bedding recycling and site earthwork improvements.

Conceptual plans providing the existing site layout and detailing the proposed improvements are included in **Appendix A**.

Section 4 Nutrient Load Reductions

The report, *Evaluation of Effectiveness of Abatement Strategies Compared Against Pre-Drainage and Existing Conditions in the Lake Okeechobee Watershed*, authored by Soil and Water Engineering Technology, Inc. (SWET) and published on May 28, 2019, evaluated the effectiveness of nutrient abatement strategies in the Lake Okeechobee Watershed using the Watershed Assessment Model, a GIS-based tool that simulates hydrology and water quality. These efforts, conducted to support the Lake Okeechobee Basin Management Action Plan (BMAP), provided guidance for the SFWMD, the FDEP, and the Florida Department of Agriculture and Consumer Services (FDACS). The study compared current and historical conditions to identify cost-effective BMPs and projects for improving water quality across the watershed. The SWET report provides estimates of the nutrient load (Nitrogen and Phosphorus) for various land uses in pounds per acre per year (lbs/ac/yr). Nutrient load rates are provided for a base condition, and reduced rates are provided assuming fertility and drainage BMP implementation. The data in this report was used to identify how the proposed changes in the land uses and fertility and the implementation of water management BMPs will reduce nutrient loads. WAM results have indicated an anticipated decrease of 2,813 lbs/yr TN and 1,845 lbs/yr TP, a 46% and 86% reduction, respectively. Please see **Table 1** in the following pages for a summary of values used in this calculation.

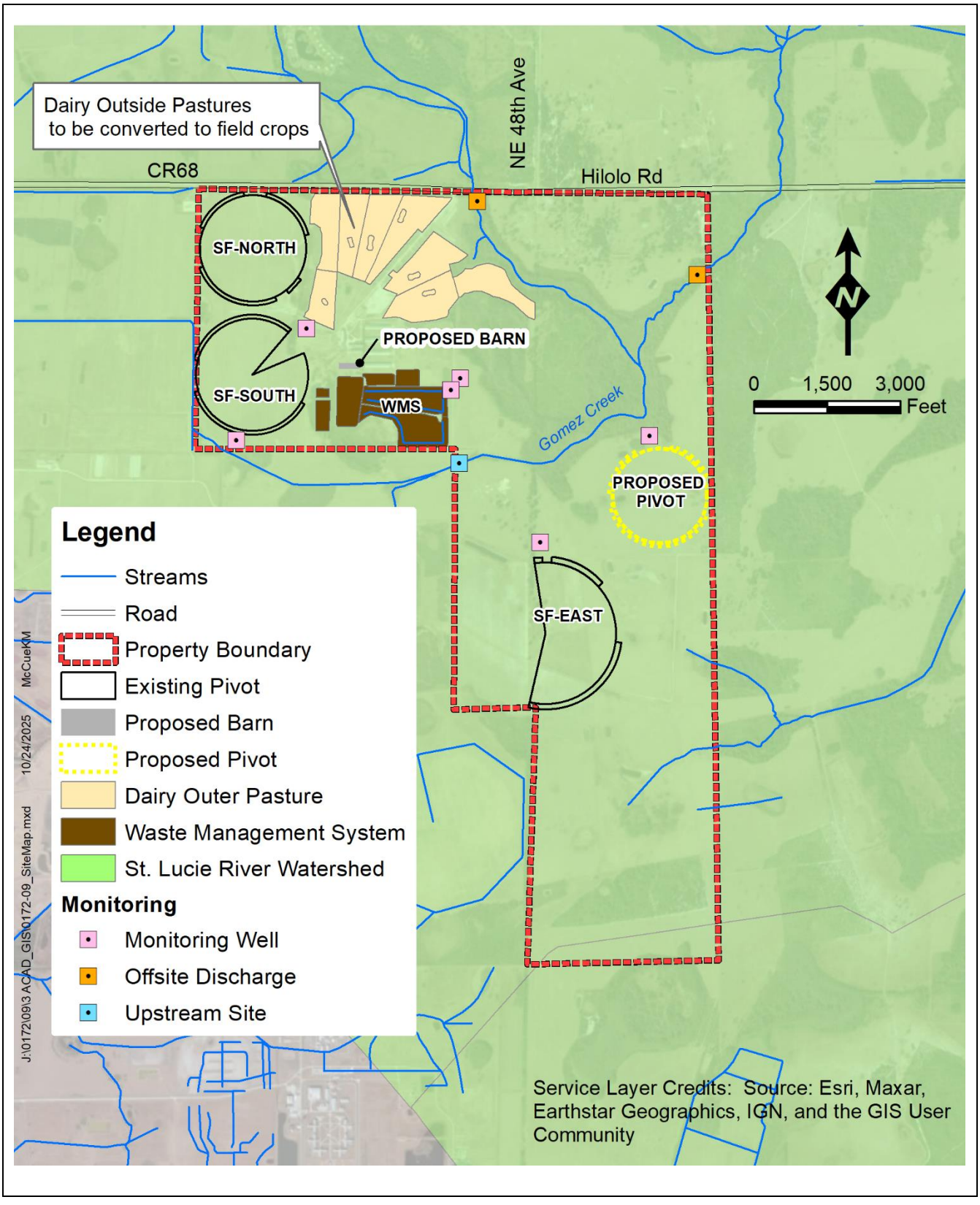

Figure 2 Proposed Improvements

Table 1 Nutrient Load Reduction Calculation

Land Use	Acres	TN[1] (lbs/ac/yr)	TP[1] (lbs/ac/yr)	TN (lbs/yr)	TP (lbs/yr)
Existing Conditions					
Dairy Outer Pasture	149.7	37.8	13.99	5,659	2,094
Unimproved Pasture	75	6.9	0.84	518	63
			Total Load	*6,176*	*2,157*
Proposed Conditions					
Field Crop with Fertility BMP	149.7	13.3	0.95	1,991	142
Field Crops-Dairy Sprayfields with Fertility	75	18.3	2.27	1,373	170
			Total Load	*3,364*	*312*
			Nutrient Load Reduction	**2,813**	**1,845**
			% Reduction	**46%**	**86%**

1. Evaluation of Effectiveness of Abatement Strategies Compared Against Pre-Drainage and Existing Conditions in the Lake Okeechobee Watershed, Soil & Water Engineering Technology, Inc., 2019

Section 5 Permitting Plan

J.M. has an existing Water Use Permit (WUP) through SFWMD Permit Number 47-00179-W. This permit was recently updated in December 2024 and approved, including the proposed modifications. As such, it is not anticipated that J.M. will need any additional modification to their SFWMD WUP.

J.M. operates under FDEP CAFO Permit No. FLA139254. A modification of this permit will be requested based on a revised Nutrient Management Plan (NMP), which will recalculate the volumetric nutrient balance and water quality resulting from the proposed confinement. The revised NMP will also include a wetland delineation, Threatened and Endangered (T&E) Species Survey, and how any mitigation requirements for T&E or wetlands will be accomplished. For this project, no wetland or T&E mitigation is anticipated.

Section 6 Monitoring & Reporting Plan

A map of the wells and pump stations used in the water quality monitoring and water use and level monitoring protocols are shown in Figure 2. The monitoring plan will consist of the following:

- Water quality monitoring – Quarterly
    - Existing monitoring wells, plus one new monitoring well to be installed near the proposed pivot
    - WSP
    - One upstream stations
    - Two offsite discharge locations
- Pumpage record – Monthly
    - Flow meters readings are currently and will continue to be collected from the existing irrigation pump station
    - Flow totals will be recorded monthly
- Water level
    - Staff gauge WSP – Weekly

6.1 Water Quality Monitoring

In accordance with the NMP, the groundwater monitoring wells are tested on a quarterly basis and analyzed by a laboratory approved by the Florida Department of Health and Rehabilitation Services. At a minimum, water samples are analyzed for the following parameters:

- Total Nitrogen (as N)
- Nitrate Nitrogen (as N)
- Total Phosphorus (as P)
- Ortho Phosphorus (as P)
- pH
- Water Level
- Specific Conductance
- Fecal Coliform
- Temperature

This information is submitted quarterly to the FDEP and can be shared with the SFWMD as part of this project. During these quarterly events, water quality will also be collected from the upstream and the two offsite discharge locations.

6.2 Water Use and Level Monitoring

As a requirement of J.M.'s FDEP permit water level monitoring are already conducted for onsite monitoring wells and the WSP. In addition, monthly meter readings are taken from the irrigation pump station and submitted quarterly.

6.3 Final Report

At the conclusion of the five-year monitoring period, a comprehensive final water quality report will be submitted, summarizing the results, evaluating the effectiveness of implemented practices, and providing recommendations for ongoing management.

Section 7 Operations Plan

JM proposes to transition to a full confinement facility. The existing system will be upgraded by the following work:

- Move cows out of High Intensity Area by constructing a 550-cow freestall barn with advanced manure handling systems.
- Expanding the existing barn to accommodate 120 special-needs cows.
- Installing a 25,000-gallon flush tank, flush/fresh water supply mains, and cow comfort fans.
- Development of a 75-acre center pivot irrigation system with supporting PVC mains and diesel generator.
- Sand bedding recycling and site earthwork improvements.

Section 8 Project Funding Plan & Cost Effectiveness

J.M. is seeking cost-share funding from the Florida Department of Agriculture and Consumer Services and the South Florida Water Management District. By requesting funding from multiple agencies, J.M. can seek a reduced cost-share amount from each entity, ensuring efficient use of public resources and demonstrating strong inter-agency collaboration in pursuit of enhanced water quality outcomes. Please see **Table 2** below for a summary of the proposed funding plan.

Table 2 Funding Plan

Component	Cost
Present Cost	$3,649,569
Future Cost (F/P, 4.5%, 20 yrs)	$8,801,716
Annual Operation and Maintenance Costs ($/yr)	$100,000
Total Annual Average Costs (F/P, 4.5%, 20 yrs) / 20 + O&M	$540,086

A detailed breakdown of the present cost for the proposed improvements is provided in **Appendix B**.

The cost effectiveness of the proposed improvements in regards to nutrient reduction was calculated by dividing the total annual average cost by the anticipated pounds per year of nutrient reduction. Please see **Table 3** provided below.

Table 3 Cost Effectiveness of TP and TN Reduction

Parameter	Equation	$/lb/yr
TP	$540,086/1,845	$288
TN	$540,086/2,813	$188

Section 9 Implementation Plan

Table 4 summarizes the implementation schedule for the proposed project.

Table 4 Implementation Schedule

Task No.	Task Title	Task Start Date	Task End Date
1	Site Assessment and Permitting	2025	2026
2	Engineering and Design	2025	2026
3	Infrastructure Construction	2026	2028
4	Monitoring and Reporting	2026	2031
5	Reporting and Compliance	2026	2031

Section 10 References

Larson Barn 3 Comprehensive Nutrient Management Plan (Version 13). Royal Consulting Services, Inc., prepared for the Natural Resources Conservation Service, U.S. Department of Agriculture, Aug. 2023.

Notice of Draft Permit File Number FLA139254-009-IW4A. Florida Department of Environmental Protection, 30 Nov. 2023.

Soil and Water Engineering Technology, Inc., 2019. Evaluation of Effectiveness of Abatement Strategies Compared Against Pre-Drainage and Existing Conditions in the Lake Okeechobee Watershed. Prepared for South Florida Water Management District, May 28, 2019.

South Florida Water Management District, 2024. North/South Everglades and NEEPP Boundaries, updated August 27, 2024. SFWMD Open Data Catalog.

Appendix A

Conceptual Plans

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Figure 1
JM Larson
Barn 3 - Site Overview

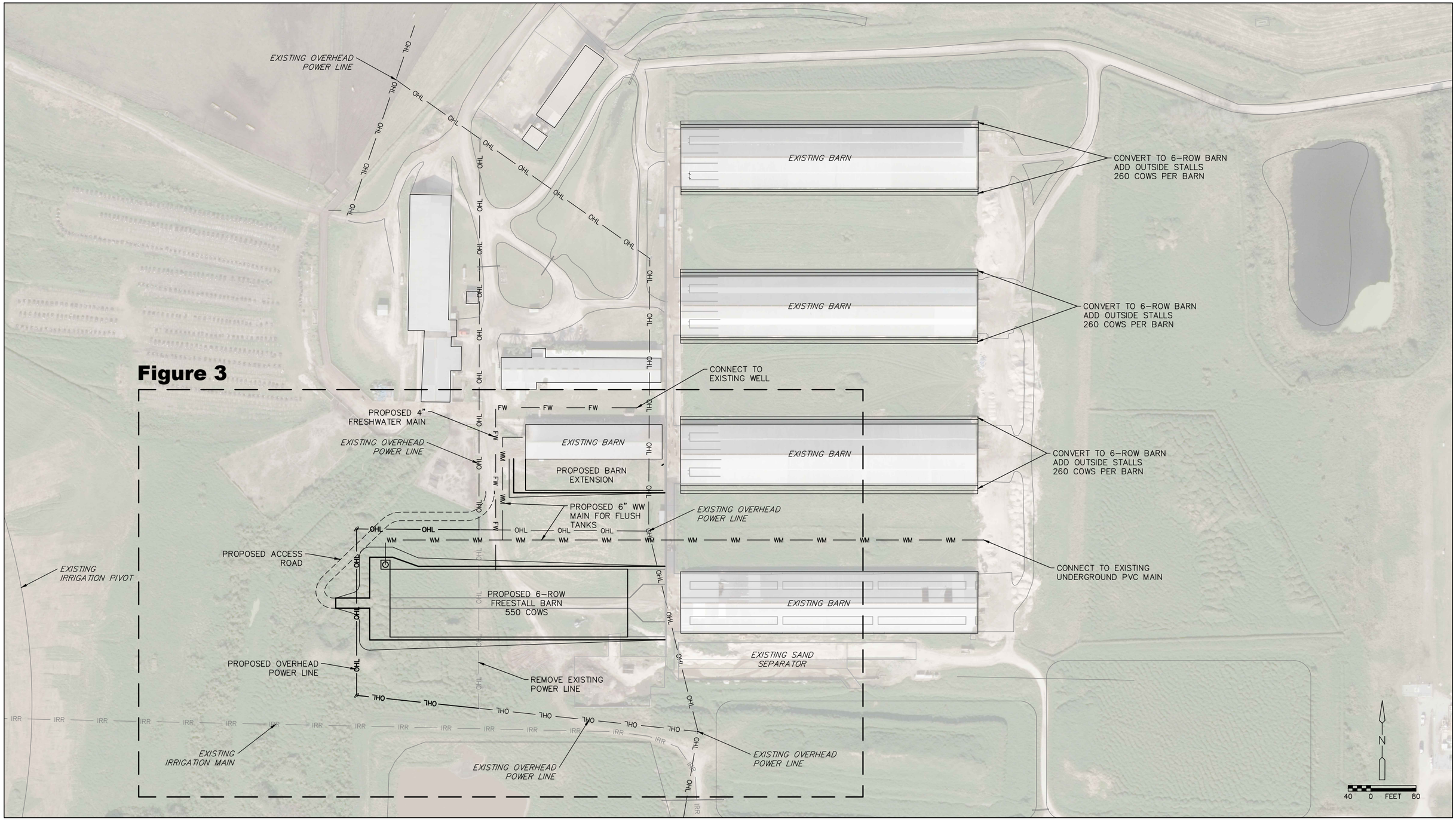

Figure 3

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Figure 2
JM Larson
Barn 3 - Barn Overview

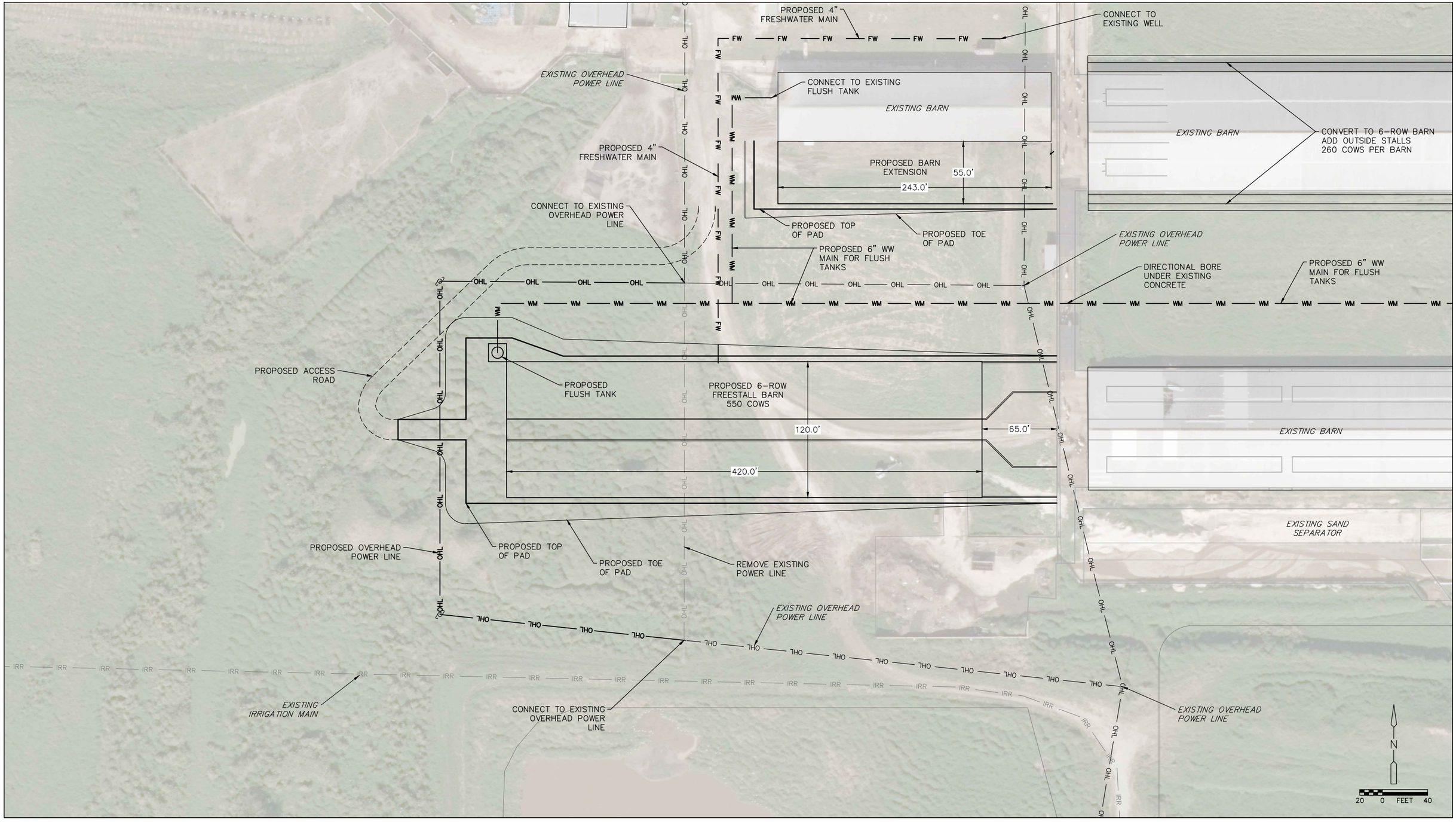

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Figure 3
JM Larson
Barn 3 - Barn Site Detail

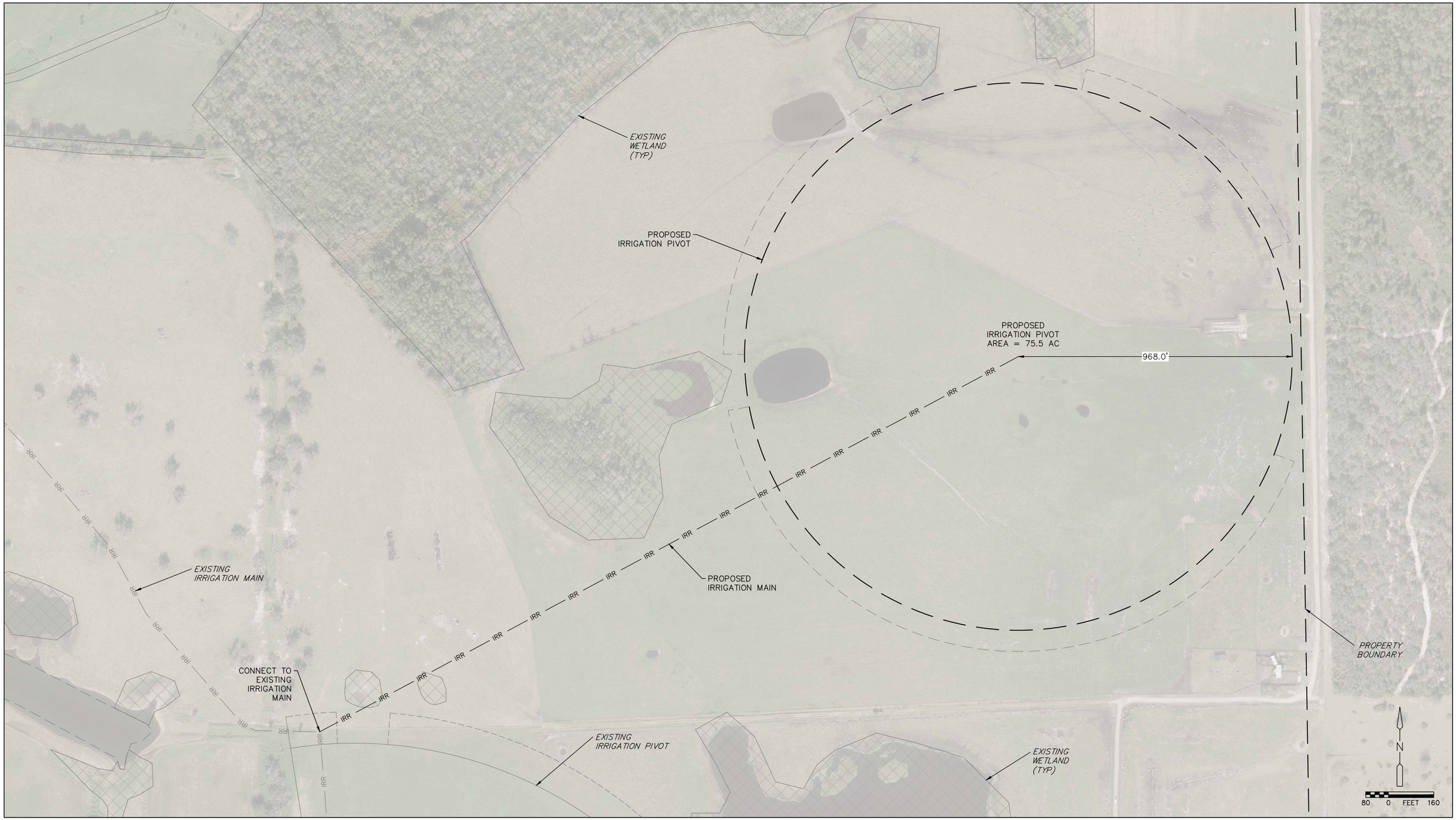

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Figure 4
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Barn 3 - Irrigation Pivot Site Detail

Appendix B
Detailed Breakdown of Present Cost

J.M. Larson, Inc.
Barn 3, LLC
Barn 3 - Environmental Improvements
RCS Project No. 0172-09-ES
By: Richard A. Jones, PE
Date: October 27, 2025

Barn 1 - 550 Cow, 6 Row Freestall Barn

Description	Units	Quantity	$/Unit	Total Cost
550 Cow Freestall Barn including:	Cow	550	$2,864.32	$1,575,376.00
Barn Structure				
Barn Erection Labor				
Concrete Work				
Reuse Pipe Work & Flush Valves				
Stalls				
Fences and Gates				
Water Troughs & Water Pipe				
Electric Materials and Labor				
Sand Bedding				
Misc. expenses such as freight & supplies				
48" Cow Comfort Fans	Ea.	88	$975.20	$74,624.00
New 25,000 Gallon Flush Tanks & Slabs	Ea.	1	$49,035.19	$49,035.19
12" Flush Pipe Work	Ft	140	$98.21	$13,749.35
6" PVC Flush Water Supply Main	Ft	1320	$22.28	$29,415.78
4" PVC Fresh Water Supply Main	Ft	540	$10.14	$5,477.94
Outside Concrete Work Including:	LS	1	$134,254.00	$134,254.00
Concrete Apron & Turn Around East End				
Concrete Apron West End				
Fences and Gates				
Earthwork for Barn Pad (Includes 15% compaction)				
Grub site (Assumed 6" deep)	CY	3,550	$1.50	$5,325.00
Excavate fill from borrow, load trucks	CY	17,581	$1.50	$26,370.84
Haul fill to barn pad	CY	17,581	$1.00	$17,580.56
Place fill in barn pad	CY	17,581	$1.00	$17,580.56
Compact barn pad fill	CY	17,581	$0.50	$8,790.28
Misc. Earthwork Requirements	Percent	1	15.00%	$10,548.34
Sod - 12' wide around barn	SF	14,400	$0.35	$5,040.00
Relocate Existing OHPL (FPL)	Ft	750	$20.00	$15,000.00
Construct Access Road to Barn	Ft	450	$32.89	$14,801.67
Demolish and Remove Conflicting Concrete	LS	1	$10,000.00	$10,000.00
			Subtotal	**$2,012,969.51**

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Barn 1 - 550 Cow, 6 Row Freestall Barn

Description	Units	Quantity	$/Unit	Total Cost

Barn 2 - Special Needs 4 Row (Extend Existing Building)

Description	Units	Quantity	$/Unit	Total Cost
120 Cow Freestall Barn Expansion	Cow	120	$3,501.07	$420,128.00
Barn Structure				
Barn Erection Labor				
Concrete Work				
Reuse Pipe Work & Flush Valves				
Stalls				
Fences and Gates				
Water Troughs & Water Pipe				
Electric Materials and Labor				
Sand Bedding				
Misc. expenses such as freight & supplies				
48" Cow Comfort Fans	Ea.	14	$975.20	$11,872.00
Barn Flush Tank - *Existing*				
12" Flush Pipe Work	Ft	100	$98.21	$9,820.97
Fresh Water Supply Main - *Existing*				
Fences and Gates	LS	1	$4,350.00	$4,350.00
Earthwork for Barn Pad (Includes 15% compaction)				
Grub site (Assumed 6" deep)	CY	381	$1.50	$570.83
Excavate fill from borrow, load trucks	CY	2,151	$1.50	$3,225.93
Haul fill to barn pad	CY	2,151	$1.00	$2,150.62
Place fill in barn pad	CY	2,151	$1.00	$2,150.62
Compact barn pad fill	CY	2,151	$0.50	$1,075.31
Misc. Earthwork Requirements	Percent	1	15.00%	$1,290.37
Sod - 12' wide around barn	SF	3,576	$0.35	$1,251.60
			Subtotal	**$457,886.24**

New Irrigation

Description	Units	Quantity	$/Unit	Total Cost
75 Acre Center Pivot, Complete	Ea	1	$90,045.00	$90,045.00
12 KW Diesel Generator, Roof, Concrete Slab	Ea.	1	$24,840.00	$24,840.00
8" PVC Main to Center Pivot	Ft	2,800	$25.69	$71,944.72
Earthwork to Close Existing Pond	CY	10,454	$4.00	$41,817.60
			Subtotal	**$228,647.32**

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Barn 1 - 550 Cow, 6 Row Freestall Barn

Description	Units	Quantity	$/Unit	Total Cost

General Construction Services

Description	Units	Quantity	$/Unit	Total Cost
Engineering	Ea.	1	$81,000.00	$81,000.00
Budget for BMP Project O&M, Monitoring, Testing & Documentation	LS	1	$100,000.00	$100,000.00
Geotech/Survey/T&E/Permits	Ea.	1	$40,500.00	$40,500.00
Construction Oversight	Months	12	$15,000.00	$180,000.00
Mob/Demob/General Services	Ea.	1	$45,000.00	$45,000.00
			Subtotal	**$446,500.00**
			Project Subtotal	**$3,146,003.07**
			Sales Tax	$188,965.22
			Contingency 10%	$314,600.31
			Total with Taxes & Contingency	**$3,649,568.60**