

CONSUMPTIVE USE TECHNICAL STAFF REPORT  
15-Jul-2014  
APPLICATION #: 2-083-91926-4

**Owner:** Sleepy Creek Lands LLC  
Ste 200  
700 S Federal Hwy  
Boca Raton, FL 33432-6128

**Applicant:** Sleepy Creek Lands LLC  
Ste 200  
700 S Federal Hwy  
Boca Raton, FL 33432-6128

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**Compliance Contact:** Mike Rogers  
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**Project Name:** Sleepy Creek North and East Tracts (formerly called Adena Springs Ranch)  
**County:** Marion

**Located in CFWI:** No  
**Objectors:** Yes

**Recommendation:** Substantive Denial  
**Reviewers:** Dwight Jenkins; Timothy Wetzel

**Recommended Permit Duration and Compliance Reporting:**

The applicant has requested issuance of a 20-year duration permit. Staff is recommending substantive denial of the application.

**Use Status:**

The request (the "Sequence 4 Permit") is to modify the proposed consolidated consumptive use permit no. 2-083-91926-3 (the "Sequence 3 Permit") to authorize the withdrawal of an additional 1.12 mgd of groundwater on the Sleepy Creek Lands North Tract. If issued, the withdrawals for the project would be 2.08 mgd for the North Tract

and 0.5 mgd for the East Tract, for a total of 2.58 mgd. Other than the increase in allocation, no other changes are proposed with this modification.

The Sequence 3 Permit would authorize the use of 1.46 mgd of existing permitted groundwater for irrigation of 2,231 acres of improved pasture and other crops, and watering of cattle. In that permit, the applicant requests authorization to consolidate two existing consumptive use permits and to relocate at least 0.96 mgd of the groundwater withdrawals to the Sleepy Creek Lands North Tract, which is further from Silver Springs than the current withdrawal locations.

## **PROJECT DESCRIPTION:**

### **Project Location:**

The Sleepy Creek Lands North and East Tracts cattle farm project is located in northern Marion County northwest and southeast of the community of Fort McCoy. The project consists of two separate non-contiguous parcels (the northern portion of the Sleepy Creek Lands LLC property and the Ft McCoy/Jones Turf-Grass Farms). The project area that is the subject of this application consists of a total of approximately 8,218 acres.

### **Hydrogeologic Setting:**

The project site is located in North Central Florida and lies on the eastern edge of what is known as the Ocala Uplift or Ocala Platform. The Ocala Uplift is an area where the limestone that comprises the Floridan Aquifer System (FAS) exists at or very near land surface. Typically, the limestone in the Ocala Uplift area has little to no unconsolidated material covering it. The occurrence of karst features (caves, sinkholes, karst prairies) are very common in this area. The Ocala Uplift is bordered by a geologic feature called the Cody Escarpment. The Cody Escarpment is where the limestone transitions from having no or thin cover to being more substantially covered by the clays and other sediments of the Hawthorn Group and sands, shell and silt that contain the surficial aquifer. The North Tract lies to the east of both the Ocala Uplift and the Cody Escarpment in an area where there is substantial cover by clays and other sediments of the Hawthorn Group. As a result, there is a surficial aquifer system on-site and the effect of withdrawals from the Upper Floridan aquifer are buffered. Although the property is bordered on the west by karst prairies, site investigations have shown that there are no karst prairies within the project area. Based on a review of available information, District staff has determined there are generally five hydrogeologic units of relevance within the site. These hydrogeologic units include the surficial aquifer system (SAS), the intermediate confining unit (ICU), the Upper Floridan aquifer (UFA), the middle confining unit I (MCUI), and the Lower Floridan aquifer (LFA).

The surficial aquifer system (SAS) is unconfined, and its upper boundary is defined by the water table. The SAS in the vicinity of the site is predominantly quartz sand layered between clayey sands. Based upon the test boring data collected near the site of Pivot Well 9, the sediments that form the SAS extend to a depth of approximately 55-60 ft below land surface (bls).

The top of the underlying ICU is defined by the presence of stiff, gray-green, phosphate bearing clays that make up the top of the Hawthorn Group. The lower portion of the ICU consists of sandy clay grading to hard, light tan colored, dolomitic limestone. The hard

limestone layer generally occurs at a depth of 100 feet, and defines the bottom of the ICU and the top of the UFA.

The UFA consists of alternating layers of soft and hard light cream to brown limestone. The base of the UFA (and the top of the MCUI) was identified at 340 ft bls based on 1) a change from softer materials to much harder ones, 2) a high electrical resistivity log response in geophysical testing performed on a 950-foot deep test hole, and 3) correlation to other wells where the MCUI has been mapped by the District.

Based on the results of the deep test hole, the brown limestones and dolostones that comprise the MCUI have been estimated to extend from a depth of 340 ft to 750 ft bls. Preliminary evaluations based on temperature and fluid conductivity logs, as well as correlation with other logs, indicate that the base of the MCUI and the top of the LFA is 750 ft bls.

The section of the LFA encountered during drilling of the on-site test hole consists of alternating beds of limestone and dolostones. The test hole penetrated the upper 200 feet of the LFA (depth of 950 ft bls). Review of currently available information for the region indicates that the LFA extends to a depth of approximately 1,800 ft bls in the vicinity of the site.

#### **Background:**

The project consists of converting approximately 7,208 acres of pine plantation, improved pasture and wetlands (North Tract), and 1,010 acres of existing sod farms (East Tract) into a cattle grazing and finishing operation for the production of grass-fed beef. The project is designed to maximize cattle forage intake on the North Tract through intensive rotational grazing practices and minimize the need to use supplemental feed. On the East Tract, the applicant proposes to utilize more standard grazing and pasture management techniques. To produce the forage necessary for grazing operations, the applicant is proposing to irrigate 2,231 acres of pasture grasses and grain crops. Each irrigated area will be watered with an efficient center pivot irrigation system.

The project is designed around the cattle finishing process. Based on the ranch model, arriving cattle with an average weight of 875-lbs will be temporarily held at receiving corrals. They will then be grazed and rotated over time through the irrigated pastures and grain crops, eventually reaching the beef harvesting facility corral. The pasture rotation process will maximize cattle weight gain so that by the time the cattle reach the harvesting facility their anticipated finished weight will be 1,150-lbs. Due to the variable crop production throughout the year, excess forage production during the high growth periods will be mechanically harvested as haylage. This haylage will provide supplemental feed for the cattle during transitional periods when pasture or crop growth is insufficient to keep up with animal needs.

In addition to pasture and grass/crop irrigation, the applicant is also requesting to withdraw and use water for cattle watering. The percentage breakdown of use by type (irrigation and cattle watering) is 97% irrigation and 3% cattle watering. The site also consists of non-irrigated pasture areas and other non-irrigated, miscellaneous land uses (e.g., timber).

**Water Supply System Description:**

The applicant is proposing to construct fourteen 12-inch wells and five 5-inch wells. There are four 12-inch diameter wells, five 5-inch wells, one 6-inch diameter well, three 4-inch diameter wells and one 2-inch well already on the properties. The 12-inch diameter wells will withdraw water from the Upper Floridan aquifer to supply 21 center pivots which will be used for irrigation and chemigation of improved pasture areas. The six, five, four and two-inch wells will be used for cattle watering. The typical 12-inch diameter well will be constructed to a total depth of approximately 200 feet, with steel casing to a depth of approximately 100 feet. Each well will be equipped with a 75-hp submersible pump and will be capable of producing 1,500 to 2,500 gpm.

On the North Tract, the applicant proposes to use fifteen long radius pivot irrigation arms that are capable of rotating 360° in 24-hrs. On the East Tract, the applicant proposes to use the existing six pivots on the sod farms. Water will be supplied to each pivot by a UFA well.

**Description of Proposed Water Use:**

The request is to modify the Sequence 3 Permit to authorize the withdrawal of an additional 1.12 mgd of groundwater on the Sleepy Creek North Tract. The total project would include the irrigation of 2,231 acres of pasture grasses and grain crops using 21 center pivot irrigation systems and to water up to 9,500 head of cattle. The project area is divided between two tracts, the North Tract and East Tract.

On the North Tract, the applicant proposes to irrigate 1,620 acres using 15 center pivot systems. In any year, 20% of the irrigated area will be double-cropped with pasture grass and grains crops. The remaining 80% of the irrigated area will be used to grow pasture grasses only. The proposed use is 100% agriculture.

The East Tract consists of two adjacent parcels, which currently are permitted by CUPs #2-083-91926-2 and 2-083-3011-7, which have a combined allocation of 532.9 mgd (1.46 mgd) to irrigate 1,010 acres of sod (total). In the Sequence 3 Permit, the applicant proposes to reduce the permitted irrigated area on the East Tract from 1,010 acres of sod to 611 acres of pasture grasses. The reduction in the permitted irrigated area and the change to pasture grass reduces the irrigation allocation for the 2-in-10 drought year for the East Tract to 169 mgd (0.464 mgd).

**Aquifer Testing:**

In order to evaluate impacts of the requested withdrawals, the applicant conducted two UFA aquifer performance tests (APTs) and coordinated with the District in the planning and implementation of a third UFA APT. The first two tests were comparable in scope and duration, while the third test was expanded in both scope and duration. In all cases, aquifer test plans were reviewed by District staff prior to implementation.

The first APT was conducted on the North Tract on a well that will serve proposed Pivot 9. The APT on Well 9 (formerly Well 21) began on March 26, 2012. Withdrawal rates of 2,338 gpm were maintained for 2.3 days before the test was terminated. Drawdown at

UFA observation wells located within 100 feet of the test production well varied from three to 3.5 feet at the end of the test. Manual readings taken from wells located approximately 4,700 feet from the pumping well indicated UFA drawdown of approximately 1.5 feet. Standard analytical techniques were used to estimate the UFA transmissivity from drawdown data collected from the wells located within approximately 100 feet of the production well. A mean value of 112,138 ft<sup>2</sup>/day was estimated for the UFA transmissivity, along with a leakance of 3.12E-9 day<sup>-1</sup> interpreted from the type-curve matching evaluation.

The second APT was performed on Well 33 (formerly Well 83) near the southwest corner of the larger tract of property owned by the applicant (approximately 5,000 feet east of Indian Lake Prairie). The APT began on October 17, 2012. Withdrawal rates of 1,423 gpm were maintained for 2.0 days before the test was terminated. Drawdown at UFA observation wells located within 100 feet of the test production varied from 9 to 12 feet at the end of the test. Standard analytical techniques were used to estimate the UFA transmissivity from drawdown data for wells located within approximately 100 feet of the production well. A mean value of 12,200 ft<sup>2</sup>/day was estimated for the UFA transmissivity. Leakance estimated from the type-curve matching was estimated at 1.0E-2 day<sup>-1</sup>.

The estimated parameters from the first two APTs significantly deviated from those utilized in the calibration of the North Central Florida Active Water-Table Regional Groundwater Flow Model (NCF model). UFA transmissivities within the NCF model at these APT locations yielded 625,000 ft<sup>2</sup>/day for Well 9 (compared to a mean test value of 112,138 ft<sup>2</sup>/day), and 2,000,000 ft<sup>2</sup>/day for Well 33 (compared to a mean test value of 12,200 ft<sup>2</sup>/day).

District staff reviewed all of the available data for the region, including the information derived from the two APTs and determined that additional site-specific information was needed in order to provide reasonable assurances regarding the on-site aquifer characteristics. With that objective in mind, a third APT was conducted. Well 9 was again used as the production well. The APT also included an array of 19 wells monitoring: the SAS (total of four wells); the ICU (total of four wells); the UFA (total of ten wells); and the uppermost portion of the MCUI (one well). The majority of the shallower wells (SAS and ICU) were constructed within 150 feet of the production well. Several of the UFA wells were within 100 feet of the pumping well, with the remainder spaced at distances varying from 800 to 13,000 feet. Background wells were established at the second APT site (Well 33), approximately five miles to the south/southwest.

The data collected during the third APT indicate that the UFA transmissivity values within a significant portion of the project site should generally be lowered when this area is represented in the NCF model. This means that the NCF model runs conducted as part of this application review are conservative (e.g., over-estimate harm) with regard to potential impacts to Silver Springs.

#### **Ground Water Flow Modeling:**

The current version of the District's NCF model was used to estimate impacts on local and regional groundwater levels and flows. Many project specific simulations were run by both the applicant's consultants as well as District staff using the NCF model. The simulations included assessment of individual (project specific) and cumulative impacts by applying the District's groundwater use estimates for 1995 and End of Permit (EOP) allocations. In its evaluation of the requested increase in withdrawals, the District also developed and utilized a sub-regional model wherein the aquifer parameters within the model were adjusted based on APT results ("Sub-Regional model"). The results of the APTs are described above. In addition, a revised version of the NCF regional model that incorporated the parameters from the sub-regional model was created and utilized ("Modified NCF model").

#### **PERMIT APPLICATION REVIEW:**

Section 373.223, F.S., and Section 40C-2.301, Florida Administrative Code (F.A.C.), require an applicant to establish that the proposed use of water:

- (a) is a reasonable-beneficial use;
- (b) will not interfere with any presently existing legal use of water; and,
- (c) is consistent with the public interest.

In addition, the above requirements are detailed further in the District's Applicant's Handbook: Consumptive Uses of Water, September 16, 2012 ("A.H.") District staff has reviewed the consumptive use permit application pursuant to the above-described requirements and has determined that the application does not meet the conditions for issuance of this permit. A summary of District staff's review is provided below.

#### **REASONABLE BENEFICIAL USE CRITERIA [Section 10.3]**

##### **Economic and Efficient Utilization [10.3(a)]:**

Staff evaluated whether the proposed water is in such quantity as is necessary for economic and efficient utilization by considering the amount of water needed for the proposed crops and livestock. Requested irrigation quantities were determined using the District's supported program, GWRAPPS (GIS-based Water Resources & Agricultural Permitting & Planning System), specifically tailored for this location and proposed crops. GWRAPPS is a program based on the AFSIRS (Agricultural Field Scale Irrigation Requirements Simulation) model, which was developed by the Biological and Agricultural Engineering Department, University of Florida.

The applicant submitted an extensive analysis based on the District's GWRAPPS model to estimate the amount of water needed for its proposed pasture and crop irrigation. For each irrigated area, the acreage of each soil type was determined. Based on the acreage and droughtiness of the soils identified, a soil type was selected to represent the soil type for each center pivot system (CPS) in the GWRAPPS. To improve the accuracy of estimating the irrigation requirements for this project, the applicant updated the default rainfall data typically used by the GWRAPPS program. The updated rainfall data is more representative of the actual rainfall intensities and frequencies expected at the site.

All irrigation will be performed by center pivots systems. Center pivot systems are the most efficient irrigation systems capable of irrigating large areas with varying crop types. An irrigation efficiency of 85% was assumed for the proposed fifteen and existing six center pivot systems. To insure the irrigation systems are properly managed, the applicant has submitted a Water Conservation Plan (see next section for details). The irrigation requirement for each CPS for the 2-in-10 drought year is summarized in the table below:

Irrigation Demand for the 2-in-10 drought year summary:

Pivot ID	Soil Type	CPS Area (acres)	GIR, in	GIR, mgd	GIR, mgy
<b>PHASE 1A NORTH TRACT</b>					
1	Pomona Sand	125.7	16.76	0.157	57.18
2	Lynne Sand	125.7	16.06	0.15	54.8
3	Lynne Sand	125.7	16.06	0.15	54.8
4	Lynne Sand	125.7	16.06	0.15	54.8
5	Eaton Loam Sand	96.5	16.7	0.12	43.76
6	Electra Sand	103	19.12	0.146	53.47
7	Lynne Sand	70	16.06	0.084	30.51
8	Lynne Sand	125.7	16.06	0.15	54.8
9	Lynne Sand	125.7	16.06	0.15	54.8
10	Lynne Sand	102.3	16.06	0.122	44.61
11	Eaton Loam Sand	70	16.7	0.087	31.72
12	Pomona Sand	120.5	16.76	0.15	54.83
13	Lynne Sand	100.3	16.06	0.12	43.75
14	Lynne Sand	86.5	16.06	0.103	37.7
15	Electra Sand	117.5	19.12	0.167	61
	<i>Subtotal</i>	<i>1620.4</i>		<i>2.007</i>	<i>732.51</i>
<b>EAST TRACT</b>					
E-1	Eaton loamy sand	93.1	10.46	0.072	26.45
E-2	Lynne Sand	117.3	10.01	0.087	31.89
W-1	Eaton loamy sand	20.5	10.46	0.016	5.82
W-2	Eaton loamy sand	157.1	10.46	0.122	44.63
W-3	Lynne Sand	130.7	10.01	0.097	35.54
W-4	Lynne Sand	92.3	10.01	0.069	25.1
	<i>Subtotal</i>	<i>611</i>		<i>0.464</i>	<i>169.44</i>
	<b>Project Total</b>	<b>2231.4</b>		<b>2.471</b>	<b>901.95</b>

For the irrigated areas, the applicant has requested 0.5 mgy (0.001 mgd) of ground water for chemical mixing for the application of herbicides and pesticides. This request is for a total of 212 gallons per acre per year, based on four applications per year.

The applicant has requested 41.6 mgy (0.114 mgd) of ground water to water up to 9,500 head of cattle. The requested volume is based on an average of 12 gallons per day per cow, as recommended in the District's CUP Applicant's Handbook.

The total water demand for irrigation, chemical mixing and livestock water is summarized in the table below:

Pivot ID	Soil Type	CPS Area (acres)	GIR, in	GIR, mgd	GIR, mgy
<b>PHASE 1A NORTH TRACT</b>					
1	Pomona Sand	125.7	16.76	0.157	57.18
2	Lynne Sand	125.7	16.06	0.15	54.8
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4	Lynne Sand	125.7	16.06	0.15	54.8
5	Eaton Loam Sand	96.5	16.7	0.12	43.76
6	Electra Sand	103	19.12	0.146	53.47
7	Lynne Sand	70	16.06	0.084	30.51
8	Lynne Sand	125.7	16.06	0.15	54.8
9	Lynne Sand	125.7	16.06	0.15	54.8
10	Lynne Sand	102.3	16.06	0.122	44.61
11	Eaton Loam Sand	70	16.7	0.087	31.72
12	Pomona Sand	120.5	16.76	0.15	54.83
13	Lynne Sand	100.3	16.06	0.12	43.75
14	Lynne Sand	86.5	16.06	0.103	37.7
15	Electra Sand	117.5	19.12	0.167	61
	<i>Subtotal</i>	<i>1620.4</i>		<i>2.007</i>	<i>732.51</i>
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W-4	Lynne Sand	92.3	10.01	0.069	25.1
	<i>Subtotal</i>	<i>611</i>		<i>0.464</i>	<i>169.44</i>
	<b>Project Total</b>	<b>2231.4</b>		<b>2.471</b>	<b>901.95</b>

The applicant has submitted calculations indicating a water demand that slightly exceeds the requested 2.58 mgd (2.08 mgd for the North Tract and 0.5 mgd for the East Tract). The demonstrated demand is based on all irrigated areas.

Based on the submitted GWRAPPS model runs and the proposed irrigation method, staff has concluded that the irrigation demand is an economic and efficient use of the resource. Also, based on typical farming practices and the requested allocation for livestock watering, staff have concluded the requested chemical mixing and livestock watering demand is an economic and efficient use of the resource.



**Capable of Producing Requested Amount [10.3(c)]:**

The applicant is proposing to withdraw up to 2.58 mgd annual average and up to 9.36 mgd as a maximum day withdrawal from the UFA. Staff and the applicant utilized the NCF model and information obtained from the on-site APTs to evaluate whether the UFA is capable of supplying the requested quantities of water. Based on the NCF model and the APTs, the Floridan aquifer at this property is capable of producing large quantities of groundwater from wells installed into the UFA. Therefore, District staff concludes that the UFA at this site is fully capable of producing the requested quantities of groundwater.

**Environmental Harm [10.3(d)]:**

District staff evaluated whether the proposed increase in allocation of 1.12 mgd would cause environmental harm and, if so, whether the harm has been reduced to an acceptable amount.

**Wetland and Other Surface Waters:**

In evaluating whether wetlands and other surface waters would be harmed, staff utilized a number of groundwater flow modeling scenarios that predicted both individual and cumulative drawdowns in the surficial aquifer from the proposed pumping regime. The maximum potential drawdown predicted by the various groundwater models ranged from 0.0 feet to 0.8 feet on the project site. Staff utilized the results of these groundwater flow modeling simulations, site visits and historical aerial photography of the site and vicinity to evaluate the current condition of wetlands and other surface waters. Although the wetlands and other surface waters have been affected by historic silvicultural and agricultural activities, the overall hydrologic condition of these systems do not appear to be adversely impacted from existing groundwater uses. Evaluations also included Orange Creek, Mill Creek, Daisy Creek and the Ocklawaha River. Predicted changes in stream discharge were very small (less than 0.1 cfs).

If staff were to recommend approval of this consumptive use permit, then the applicant would be required to provide a monitoring plan. This hydrologic and wetland monitoring plan would be designed to verify that the applicant's withdrawals were not causing adverse impacts to water levels in wetlands or other surface waters.

**Springs:**

There are 46 springs identified as existing in the NCF model area and the modeling indicates that the proposed withdrawals will have no impact on most of these springs or very small decreases in predicted changes in flows.

However, staff performed additional evaluations on four small springs that occur in close proximity to the project site (Orange, Camp Seminole, Wells Landing and Tobacco Patch Landing). All of these springs have significantly altered spring pools or runs due to human construction and activity.

Orange Spring: This third-magnitude spring was historically touted for its therapeutic properties and was a tourist destination at one time. The spring is enclosed by a kidney shaped pool that allows the spring to stage up and then discharge over a constructed limestone wall and into the spring run. Currently, a water bottling facility (Premium Waters Inc., CUP no. 20-083-3138-3) is situated adjacent to the spring and withdraws water from the spring for small batch boutique bottling.

Camp Seminole Spring: This fourth-magnitude spring is enclosed by a heart shaped pool and wall. Historically developed as a honeymoon resort in the 1970's, it is currently used as a Girl Scout swimming area. A manual weir system allows water levels to be manipulated in order to fill or drain the swimming area as needed.

Wells Landing Spring: This third magnitude spring belongs to a group of springs called Cannon Springs Group. The springs were inundated by Rodman Reservoir after the construction of the Eureka Dam on the Ocklawaha River.

Tobacco Patch Landing Spring: This third magnitude spring is also affected by Rodman Reservoir and is normally submerged under 4 to 5 feet of water.

Potential spring discharge changes were assessed based on the results of groundwater flow modeling. Worst case modeling scenarios predict the following reductions in flow: Wells Landing Spring 0.13 cfs; Tobacco Patch Landing Spring 0.03 cfs; Orange Spring 0.01 cfs; and Camp Seminole 0.01 cfs. Staff concludes that reasonable assurance has been provided that environmental harm to springs in the area of the proposed withdrawal has been reduced to an acceptable amount.

### **Silver Springs:**

There are no established Minimum Flows and Levels (MFLs) for Silver Springs or the Silver River at this time. However, multi-year investigations by District staff are on-going to develop MFLs for the river and a minimum flow for Silver Springs. These minimum flows and levels would be the limits at which further withdrawals would be significantly harmful to the water resources or the ecology of the area.

District staff completed regional groundwater model simulations that take into account all cumulative, EOP water uses, including the applicant's proposal to increase pumping in the North Tract by 1.12 mgd. The cumulative EOP model simulation predicts a reduction in Silver Springs flow of approximately 80 cfs. Utilizing the ecological data from the on-going MFLs investigations on Silver River and Silver Springs, analyses completed by District staff indicate that cumulative EOP reductions in Silver Springs flow will adversely impact important ecological structure and functions associated with riparian floodplains and the in-stream channel. Examples of adverse impacts to these important ecological functions include:

- Altered spatial extent of the mixed hardwood swamp plant communities
- o Reduced nutrient transformation and availability to primary and secondary producers
- o Oxidation and subsidence of floodplain organic soils

- o Reduction in aquatic fauna habitat (refugia and forage) leading to a decrease in secondary production (fish, reptiles, amphibians, wading birds, etc.)
- o Reduction in the frequency of physical contact of water with riparian or floodplain vegetation, soils and detritus that actively trap or uptake suspended and dissolved materials
  - Decrease in in-stream velocity profiles
- o Reduced velocities for scour and sediment transport
- o Reduced ability to maintain channel and floodplain geomorphology

These impacts will be caused by markedly decreasing the frequency of flooding events (high flow events) and increasing the frequency of dewatering events (low flow conditions) as a result of the cumulative EOP reductions in Silver Springs flow. As such, District staff concludes that the applicant has not provided reasonable assurance that the proposed use of water will not contribute to or exacerbate cumulative EOP adverse harm to the ecological structure and functions of Silver Springs and Silver River.

**Economic Harm [10.3(d)]:**

Section 10.3(d) provides that economic harm must be reduced to an acceptable amount. In applying this criterion, District staff evaluated the potential for economic harm that will result due to adverse water resource impacts. The District does not consider economic harm beyond that caused by water resource impacts. Silver Springs is a source of economic value to the surrounding area. Based on the environmental harm to Silver Springs described above, District staff has concluded that the applicant has not provided reasonable assurance that economic harm has been reduced to an acceptable amount.

**Water Conservation [10.3(e) and 12.5.7.1]:**

Section 10.3(e) provides that a permittee must implement all available water conservation measures unless the applicant demonstrates that implementation is not economically, environmentally or technologically feasible. It also states that this criterion can be satisfied by the implementation of an approved water conservation plan as required in section 12.0 of the A.H.

The applicant submitted a water conservation plan as required by District rule. The plan includes the commitment by the applicant to implement numerous water conservation measures. The measures include proposed installation of a very high efficiency automatically operated computerized irrigation system, periodic water audits, rainfall shutoff sensors, use of an on-site weather station, use of a professional water conservation consultant, daily maintenance inspections and other measures. Based on review of the plan, staff concludes that the proposed water conservation plan meets District water conservation requirements.

**Use of Reclaimed Water [10.3(f)]:**

Section 10.3(f) provides that reclaimed water must be used in place of higher quality ground water when readily available unless the applicant demonstrates its use is economically, environmentally, or technologically infeasible.

The applicant performed detailed analysis on whether the use of reclaimed water is feasible. The nearest source of reclaimed water is the City of Ocala, which is approximately 14 miles away. In order to utilize this source of reclaimed water, the applicant and/or utility provider would have to construct significant transmission lines to convey the reclaimed water to the site. In addition, use of the reclaimed water would require the applicant to construct a large transmission system, storage ponds and surface water pumping stations on-site. Finally, since reclaimed water availability can vary during the course of the year, the applicant would still need to construct wells in order to have ground water as a backup source.

The applicant analyzed the costs associated with all the above and demonstrated that the costs rendered the use of reclaimed water economically infeasible. In addition, staff concludes that reclaimed water is not readily available due to the significant distance of the sources from the site.

#### **Lowest Quality Water Source [10.3(g)]:**

The applicant performed a detailed analysis on whether the use of lower quality water sources is feasible. In addition to the use of reclaimed water (discussed above), the applicant evaluated whether surface water or captured storm water could be utilized to meet the water needs of this project. Specifically, the applicant evaluated whether the use of surface water from the Ocklawaha River and from on-site captured storm water was available and feasible.

As with reclaimed water, in order to utilize surface water sources, the applicant and/or utility providers would have to construct significant transmission lines plus pumping stations to withdraw and convey the surface water to the site. In addition, use of the lower quality water sources would require the applicant to construct a large transmission system, storage ponds and surface water pumping stations on-site. Finally, since the surface water would be an unreliable source and may not be able to supply the water needs during dry periods, the applicant would still need to construct wells in order to use ground water as a backup source.

The applicant analyzed the costs associated with all the above and demonstrated that the costs rendered the use of lower quality water sources economically infeasible. Specifically, the applicant looked at the costs associated with the various uses of lower quality source options and then analyzed how the costs would impact their earnings with respect to the marketplace for a similar product. The analyses show that implementing any of the lower quality source options would add significant costs, risks and uncertainty to the project and would create a price differential for the product resulting in an unfair economic burden that will likely make them uncompetitive with similar grass-fed operators. In addition, the applicant states that the additional costs would significantly reduce the grass-fed beef product premium sought by the applicant which is the basis for desiring to raise grass-fed beef over conventional beef (47% reduction). Based on the analyses submitted, staff concludes that the use of lower quality sources of water is not economically feasible to implement at this time.

#### **Saline Water Intrusion [10.3(h), 9.4.2]:**

Staff evaluated whether the proposed use of ground water from the UFA would cause or contribute to significant saline water intrusion. Because the project is located in North

Central Florida on the eastern edge of the Ocala Uplift and is a significant distance from the coast, the fresh water portion of the Floridan aquifer is very thick and there are no known sources of saline water nearby.

Fresh water (water with chloride concentrations less than 250 mg/L) underlies the project site to depths of 1,700 feet below NGVD. Review of available ground water quality information indicates that chloride concentrations in the area have been reasonably stable for many years. No problems concerning the salinity of water in the Floridan aquifer in this area are currently known to exist. Ground water modeling indicates that the potentiometric surface decline will be very small, and staff concludes that the proposed consumptive use will not cause or contribute to significant saline water intrusion.

**Flood Damage [10.3(i)]:**

Staff evaluated whether the proposed use of water will cause or contribute to off-site flooding. The proposed use of water is primarily for irrigation of pasture and crops on a supplemental basis when rainfall is insufficient to meet plant needs. As such, the applicant will only be irrigating during dry periods. Also, irrigation will occur in a very efficient manner and is designed to provide only the amount of water needed by pasture and crops. The applicant will not be over-irrigating or irrigating during wet periods. As such, any water that is used for irrigation will remain on site. Staff concludes that the irrigation will not cause or contribute to off-site flooding

**Quality of Source [10.3(j)]:**

The applicant evaluated whether the proposed withdrawals would seriously harm the water quality of the source. Specifically, the applicant evaluated the potential for ground water contamination due to the movement or migration of contaminated ground water within the Floridan aquifer into the source water of the regional aquifer system. The applicant conducted a record search (Phase 1 Environmental Survey - Type) to identify any existing contaminated sites within a 2-mile distance around the perimeter of the property boundaries. The applicant performed a review of identified and reported properties included in the following databases:

NPL  
CERCLIS  
NFRAP  
RCRA COR ACT  
RCRA TSD  
RCRA GEN  
State & Federal Brownfields  
ERNS  
State Spills 90  
SWL  
LUST  
UST & AST  
Federal IC/EC  
Dry Cleaners

The results of the record search revealed that there are no known contaminated sites within 2 miles around the perimeter of the project site. Based on this analysis, staff concludes that the proposed ground water withdrawal will have no potential impact on the movement or migration of contaminated ground water in the region.

**Water Quality Standards [10.3(k)]:**

Section 10.3(k) states that the consumptive use shall not cause or contribute to a violation of state water quality standards in receiving waters of the state, as set forth in chapters 62-3, 62-4, 62-302, 62-520, and 62-550, F.A.C., including any anti-degradation provisions of sections 62-4.242(1)(a) and (b), 62-4.242(2) and (3), and 62-302.300, F.A.C., and any special standards for Outstanding National Resource Waters set forth in sections 62-4.242(2) and (3), F.A.C. A valid permit issued pursuant to chapters 62-660 or 62-670, F.A.C., or section 62-4.240, F.A.C., or a permit issued pursuant to chapters 40C-4, 40C-40, 40C-42, or 40C-44, F.A.C., shall establish that this criterion has been met, provided the applicant is in compliance with the water quality conditions of that permit.

While the applicant's agricultural activities on the North Tract (converting forested uplands to improved pasture) are statutorily exempt from the need to obtain an environmental resource permit (ERP), the applicant applied for and the District issued an ERP (No. IND-083-130588-4). The activities approved by the ERP provide additional water quality treatment through the establishment of vegetated upland buffers, retention berms, redistribution swales, and the implementation of other conservation practices in the North Tract. This ERP is the subject of an administrative proceeding. For the reasons set forth in the technical staff report for the ERP, District staff have concluded that this criterion has been met for the North Tract through implementation of the activities included in the ERP. If this CUP application were to be approved, it would have been conditioned to require construction of the stormwater management system in accordance with the ERP prior to withdrawing water to irrigate the pivot areas.

**REASONS FOR DENIAL [Section 9.4.1]**

**Saline Water Intrusion [9.4.2]:** See above discussion on saline water intrusion.

**Off-site Damages [9.4.3]:** Section 9.4.3, A.H., provides that a permit will be denied if the permit would allow withdrawals that would cause an unmitigated adverse impact on adjacent land uses that existed at the time of permit application. Adverse impacts on adjacent land use include significant reduction in water levels in an adjacent surface water body, significant potential for land collapse or subsidence caused by a reduction in water levels and damage to crops, wetlands or other types of vegetation.

Based on the anticipated cumulative impacts to Silver Springs discussed above, staff believe that the proposed use of water will contribute to off-site damages (e.g., water levels, wetlands and vegetation in the area of Silver Springs and Silver River).

**Water Reserved from Use [9.4.5]:**

The issuance of a permit will be denied if the proposed use will require the use of water which pursuant to subsection 373.223(4), F.S., and rule 40C-2.302, F.A.C., the Board has reserved from use by rule (9.4.5, A.H.).

Staff evaluated whether issuance of the permit will require the use of water, which has been reserved from use by rule. Section 9.4.5, A.H., provides that the Governing Board by regulation may reserve from use by permit applicants, water in such locations and quantities, and for such seasons of the year, as in its judgment may be required for the protection of fish and wildlife or the public health and safety. The Governing Board has reserved from use a certain portion of the surface water flow through Prairie Creek and Camps Canal south of Newnans Lake in Alachua County, Florida (section 40C-2.302, F.A.C., August 18, 1994). District staff used ground water modeling results to assess the potential effects of the proposed withdrawals on SAS and UFA water levels in the area of Prairie Creek and Camps Canal. Model results predict no significant reduction in SAS and UFA water levels in the area of interest. Staff concludes that reasonable assurances have been provided that the proposed use of water will not impact surface water flow through Prairie Creek and Camps Canal which has been reserved from use by rule pursuant to rule 40C-2.302, F.A.C.

**Minimum Flows [9.4.6]:**

The issuance of a permit will be denied if the proposed use will cause the rate of flow of a surface watercourse to be lowered below a minimum flow which has been established pursuant to subsection 373.042(1), F.S., or Chapter 40C-8, F.A.C. (9.4.6, A.H.). Staff evaluated whether issuance of the permit will cause the rate of flow of springs and surface watercourses to be lowered below an established minimum flow. Sections 9.4.1(e) and 9.4.6, A.H., provide that issuance of a permit will be denied if the permit would allow withdrawals of water to cause the rate of flow of a surface watercourse to be lowered below a minimum flow which has been established pursuant to subsection 373.042(1), F.S., or Chapter 40C-8, F.A.C. A minimum rate of flow has been established for Blue Spring (Volusia County); Messant, Seminole and Palm springs (Lake County); and Rock Springs (Orange County), which are all springs within the NCF model domain. In order to evaluate the potential for spring flow alterations, District staff used ground water modeling results to assess the potential effects of the proposed ground water withdrawals on the established minimum flows. Model results predict no reduction in spring flows. Staff conclude that reasonable assurances have been provided that the proposed use of water will not adversely affect minimum flows for springs located within the NCF model domain

**Minimum Levels [9.4.7]:**

The issuance of a permit will be denied if the proposed use will cause the level of a water table aquifer, the potentiometric surface level of an aquifer, or the water level of a surface water to be lowered below a minimum level which has been established pursuant to subsection 373.042(2), F.S., or Chapter 40C-8, F.A.C. (9.4.7, A.H.). Staff evaluated whether issuance of the permit will cause the water level in ground water or surface water bodies to be lowered below a minimum level established by rule. Sections 9.4.1(f) and 9.4.7, A.H., provide that issuance of a permit will be denied if the permit would allow withdrawals of water to cause the level of a water table aquifer, the potentiometric surface level of an aquifer, or the water level of a surface water to be lowered below a minimum level which has been established pursuant to subsection 373.042(2), F.S., or Chapter 40C-8, F.A.C. Eighty-two surface water bodies with minimum levels specified in subsection 40C-8.031(4), F.A.C., are present within the NCF model domain. In order to evaluate the potential for causing the lake levels to be altered

below the established minimums, District staff used ground water modeling results to assess the potential effects of the proposed withdrawals on the potentiometric surface of the UFA beneath lakes with established minimum levels within the model domain. Those results indicate that the proposed withdrawal will not cause a significant reduction in UFA potentiometric levels below these lakes. Staff conclude that reasonable assurances have been provided that the proposed withdrawals will not cause a water level to fall below its established minimum level.

**INTERFERENCE WITH EXISTING LEGAL USE OF WATER [Section 9.2]:**

As part of its evaluation to address potential interference with existing legal uses, District staff researched whether there are any existing wells near the project. Because there were so few wells near the project, District staff evaluated this criterion by performing an evaluation using a hypothetical well located at the property boundary. The evaluation included the following conservative assumptions:

1. A small domestic well located within 100 feet of the project boundary (areas of highest potential drawdown), installed either in the shallow aquifer or the Upper Floridan aquifer.
2. A centrifugal pump is used to pump the water from the shallow aquifer well with lift capacity of 25 feet.
3. A small submersible pump is used to pump water from the Upper Floridan aquifer well.
4. The minimum total hydraulic head for the submersible pump (including head loss in pipes and pressure at the house) is 60 psi or 135 feet.
5. A maximum 1 day withdrawal at 9.36 mgd and maximum 30-day withdrawal at 5.85 mgd were considered in the evaluation. This was modeled using a transient stress period at the end of a 30-year stress period (steady state condition).

The various analyses performed indicate that there will not be any drawdown in the SAS and a very small drawdown in the UFA at the edge of the property. As such, staff concludes that the proposed ground water withdrawals will have no adverse impacts on legal water uses.

**PUBLIC INTEREST [Section 9.3 and 10.3(b)]:**

Staff evaluated whether the requested consumptive use of water is consistent with the public interest. Staff concludes that the requested increase in allocation of 1.12 mgd of groundwater is not consistent with the public interest because the applicant has not provided reasonable assurance that the requested withdrawal meets the District's permitting criteria.