

Final  
ENVIRONMENTAL ASSESSMENT  
FOR  
BEAVER DAM STATE PARK (W-69-L)  
LAND TRADE AND SEWAGE TREATMENT SYSTEM IMPROVEMENTS

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Submitted to  
U. S. Fish & Wildlife Service, Region 3  
Division of Federal Aid

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IDNR Region IV Environmental Assessment  
Beaver Dam Park (W-69-L)  
Land Trade and Sewage Treatment System Improvements

Chapter 1     **Purpose and Need for Proposed Action**

1.1     **Purpose**

The purpose of this document is two fold. First, to examine the various alternatives to improving the sewage treatment system at Beaver Dam State Park (W-69-L). Second, to consider the impacts of the proposed land traded with Federal Aid interest in conjunction with the sewage treatment system alternatives.

1.2     **Need**

1. To ensure that any taking or impact to Federal Aid land or purposes is fully compensated.
2. To ensure the final Federal Aid Land configuration is manageable.
3. To develop a cost-effective, environmental-sound, sewage treatment system

1.3     **Decisions that Need to be Made**

The Service's Regional Director will select one of the alternatives analyzed in detail and will determine, based on the facts and recommendations contained herein, whether this Environmental Assessment (EA) is adequate to support a Finding of No Significant Impact (FONSI) decision, or whether an Environmental Impact Statement (EIS) will need to be prepared.

1.4     **Background**

Beaver Dam Lake and its surroundings were developed in the 1890's as a private lake club to wealthy families living in Carlinville and the surrounding area. Several years later, a small hotel was constructed on a hill overlooking the Lake. Daytime visitors and overnight guests would arrive by train to a station approximately 1 mile from the park. Horse drawn carriages would then transport the guests to the hotel, where they enjoyed fishing and boating activities throughout the warmer months. Winter activities included ice fishing and skating when possible.

In 1947, the State of Illinois used state funds to purchase the lake and a large tract of land surrounding it from the estate of Mrs. Sarah Rhodes. At this time, the height of both the east dam and the west dam were increased by approximately 2 feet, creating the current 60 acre lake known as Beaver Dam Lake. In 1962, Illinois purchased an additional 312 acres at Beaver Dam State Park through the Pittman-Robertson Wildlife Restoration Program (W-69-L). Federal regulations require that this property continue to serve the purpose for which it was acquired. At Beaver Dam State Park, the primary purpose of the federal aid land acquisition was two-fold:

1. "area will be managed for the production and harvest of squirrel, rabbits, quail, deer and dove."
2. "to purchase additional land for hunting purposes at Beaver Dam Lake".

This acquisition brought the Park to its current size of 751 acres (See Attachment 4 for a map current site conditions)

Within the last couple of years, several capital improvements projects have occurred at Beaver Dam State Park to upgrade and enhance recreational activities on the portion of the park purchased with state funds only, with no federal nexus. These projects include a new concession building with food service, camping supplies, and restroom facilities, road and parking lot resurfacing, new sanitary dump station for campers and recreational vehicles, new boat docks, and trail rehabilitation. Current capital projects under construction include a dam rehabilitation project, a new boat ramp with additional floating docks, a fish cleaning station, vault toilet replacement and a park-wide accessibility project to make the existing facilities accessible to disabled visitors.

Although located in rural Macoupin County, Beaver Dam State Park typically attracts between 300,000 and 350,000 visitors each year. Many of these visitors come from the St. Louis and Springfield metropolitan areas. On many weekends, both the Class A and Class C campgrounds are filled to capacity. The site also sponsors numerous fishing tournaments in the fall which brings in thousands of visitors over an 8 week period. In addition, the site holds several archery clinics throughout the year, and serves as a check station for Macoupin County during firearm deer season.

In 2000, a recirculating pump and collection system were added to the existing sand filter treatment system at the shower house to recirculate the effluent back through the treatment sand filter. The recirculating of wastewater back through the treatment system has helped the site meet effluent standards nearly 75% of the time. Unfortunately, ammonia effluent standard are not consistently met.

Most of the problems at Beaver Dam State Park cannot be resolved by recirculating wastewater back through the sand filter. For example, all wastes from the concession building, which includes a full service kitchen and both restrooms, are drained into a 6000 gallon, underground, concrete storage tank. This tank is pumped out when necessary by a private septic hauler since there is no treatment system for the wastes. In the summer of 2002 a new fish cleaning station and a new flush toilet building were constructed near the boat ramp of Beaver Dam Lake. The wastes from both of these

sources will be stored in a 3000 gallon, underground, concrete storage tank until such time that a private septic hauler can remove the waste. Although no discharges are occurring from these sources, the contractual fees to pump out the concrete tanks are excessive and are not an efficient use of State resources. The new sewage treatment and collection system will connect all sewered and unsewered sources of wastewater and reduce operational costs to the site.

The Illinois Department of Natural Resources (IDNR) is proposing a sewage system at Beaver Dam State Park that will collect and treat wastewater from seven (7) different sources. These sites include the campground shower building, the camp host site, the fish cleaning station, a flush toilet building, the sanitary dump station, the concession building, and the site office complex. Some of these sources currently have their own wastewater treatment system, some have simple holding tanks, and some have nothing.

A single collection and treatment system is typically more efficient and less expensive to operate than multiple wastewater treatment system. In regard to better efficiency, the combined flow rate from multiple sources is more evenly distributed at the treatment plant throughout the course of the day. Small individual facilities may only be used one or two hours per day. Typically, single source treatment systems often undergo periods of feast and famine which is not the desired method to operate. In addition, a single treatment system will be less likely to produce foul odors which would interfere with the enjoyment of camping, fishing and other outdoor activities, than multiple treatment systems spread throughout the State Park. In regard to operational costs, each system would have to be cleaned and repaired independently. In addition, monthly samples and laboratory tests would have to be conducted for each system.

In early 2000, the decision was made to request funding from the State of Illinois to construct a new wastewater treatment and collection system at Beaver Dam State Park. Shortly thereafter, the funding request for \$665,000 was approved by the Illinois General Assembly in the State's FY02 funding budget. In order to expedite the design process, the IDNR Division of Engineering contributed an additional \$65,000 to the project so the Illinois Capital Development Board could hire an Architect/Engineering (A/E) firm to begin collecting survey information and other data necessary to design a system. In early February, 2002, the State of Illinois released a \$665,000 appropriation for construction purposes.

## 1.5 Issues

The engineering consultant and the IDNR, Division of Engineering, have been given the task of making most of the technical decisions involved with designing a new wastewater treatment and collection system. Site and planning personnel have also contributed to the design process. Major design decisions include:

1. **Design Capacity:** Although the regulatory agency which permits waste water treatment facilities in Illinois has "standard" design capacities for various sources of wastewater, the process is far from an exact science. In addition, every attempt has

been made to accurately estimate future growth in the park in terms of projected daily attendance, campsite usage, office space, and business conducted at the concession building.

2. **Method of Treatment:** The seasonal nature of a State Park provides a unique problem with most design criteria. Most modern wastewater treatment plants serve residential areas which have similar flow rates throughout the year. Beaver Dam State Park, like most other State Parks, has an attendance rate that dramatically fluctuates with the changing of the seasons. Hence, the flow rates vary during the year. Different types of treatment systems handle the fluctuating flow rates in varying degrees of success.
3. **Method of Collection:** Before the wastes can be treated, they must first be transported to the treatment site by means of underground pipes. The steep topography of Beaver Dam State Park and the natural features such as the marsh and old oak forest make the task more difficult in winding the collection system throughout the park without disturbing plant and animal life.
4. **Preservation:** Beaver Dam has several Archeological sites which must not be disturbed by either collection lines or a treatment plant. In addition, every attempt is being made to remove as few trees as possible and to not interfere with existing wetlands within the Park.
5. **Location of Treatment Plant:** In addition to the obvious constraints already mentioned, several other factors must be considered before a treatment plant can be constructed. These include: vehicle access via a roadway, the availability of electric service lines to power the aeration pumps and lift stations, floodway restrictions within low lying areas, topography-a treatment plant cannot be constructed on steep terrain, and aesthetic qualities.
6. **Odor Mitigation:** One of the biggest factors to consider in choosing a combined sewage treatment plant is how to handle odors that may be produced during biological decomposition. The desired preference is to locate the treatment plant in an isolated location away from the human contact. It would not be feasible to locate the treatment plant near the campground or concession building even if we constructed a 30 foot tall fence to hide the plant from public view. It is also advantageous to locate the plant within trees so that prevailing winds cannot blow the potential odors into the other recreational areas. Trees tend to disturb air currents and force the wind to dissipate odors up into the air rather than along the ground.

## Chapter 2      **Alternatives, Including the Proposed Action**

### 2.1      **Alternatives Not Considered for Detailed Analysis**

Once funding had been approved for a new wastewater collection and treatment system by the State of Illinois' General Assembly, several ideas were discussed to develop a system which met the needs of Beaver Dam State Park. From the very beginning, it was determined that the collection system would involve underground piping between the various sources of wastewater. Whether gravity sewers or force-main sewers were installed, the location of the new sewer lines would have to follow the roadways to minimize the destruction of existing trees within Beaver Dam State Park. The roadway is also the easiest way to avoid Beaver Dam Lake.

Although not exclusive, another common consideration was that a lagoon system would be installed to treat the wastes from the Park. Neither an activated sludge system nor a fixed film process was feasible because the "food" necessary to sustain these systems would be nearly non-existent during the non-camping season when very little wastes were produced within the Park. Thus, the type of bacteria necessary to decompose wastewater into elemental components, using these types of treatment systems, would starve and eventually die over the winter months.

Although few variations were considered regarding the type and location of the collection system, and the type of treatment system, numerous options were discussed at the beginning of the project concerning the location of the treatment system. The most common limiting factor was topography. Most of the site is rolling hills, which impedes the construction of an impoundment due to excessive surface water runoff. Other topographic obstacles included the location of the lake and the location of the marsh. Most of these alternatives were not seriously considered due to the following reasons: (see attachment 5 for map of current site features)

1. Locate the lagoon near the current archery range and relocate the archery range to some other location. This proposed site is located in a low area which would be very beneficial for gravity sewers. Access to the lagoon would be very easy and only a portion of the lagoon would be visible from the roadway. The biggest detriment is that the lagoon would be across the road from the new concession building. Since odors could be a concern, the lagoon could be an odor nuisance for the patrons at the concession building. In addition, the lagoon would have to occupy a portion of ground which is currently a wetland. Approval to modify the land usage would be very difficult to obtain due to environmental concerns. Other negative factors include the destruction of several acres of existing trees, possible seepage problems due to its low elevation, and "visual" and real odor concerns from site visitors at a nearby day-use area.
2. Locate the lagoon behind the current location of the sanitary dump station. This proposed site would be located within the trees at the bottom of the hill which leads up to the camp ground. The site would be advantageous as far as gravity and access, however, this site would be near the boat ramp and camp ground. Thus, odor nuisance concerns were too great. In addition, the lagoon would have to occupy a portion of ground which is currently a wetland. Approval to modify the land usage

would be very difficult to obtain. This location would also require the removal of several acres of trees and potential seepage problems.

3. All other reasonably flat locations at IDNR property, not purchased with Federal money, contain surface water or are existing day use and camping areas. Consequently, these areas were eliminated from consideration due to odor nuisance and public safety concerns.
4. Another alternative which was not seriously considered was to pump the wastewater through a series of lift stations and underground piping to the Village of Chesterfield's wastewater treatment facility. This alternative was not considered because the lagoon system at Chesterfield is not very big since Chesterfield has a population of only 230 residents. Consequently, the design flow from Beaver Dam State Park would equal nearly 65% of the design flow from the residents of Chesterfield. In addition, the distance required to pump the wastewater is over 7.5 miles.
5. The only other plan to eliminate restricted discharges, as well as permitted discharges which do not meet effluent limits, from Beaver Dam State Park was to close the shower building, concession building and sanitary dump station. In addition, the park would not be able to open up the new fish cleaning station, or flush toilet building since there was no waste treatment available.

## **2.2 Alternatives Carried Forward for Detailed Analysis**

### **2.2.1 Alternative A (Proposed Action) - Construct Sewage Treatment Facility in Agriculture Field**

The preferred method to treat wastewater produced at Beaver Dam State Park is to construct a lagoon or lagoons on site to store and treat the wastes. After inspecting several different sites, the best location for these lagoons is in a flat, agricultural field located west of the marsh. This location is approximately 1600 feet west of Beaver Dam Lake (which includes the concession building, day use areas, boat ramp, etc..) and approximately 1400 feet southwest of the Class A campground. The open field has an irregular, bottle shape and a total surface area of 9.6 acres. This preferred location referred to as Tract A, is currently on land acquired with Pittman-Robertson Wildlife Restoration funds administered by the U.S. Fish and Wildlife Service (See Attachment 1A, 1B and 1C). The proposed sewage treatment system is an anaerobic lagoon system which requires approximately 1 acre of surface water. The treated waste water from the lagoon will not be released through a point source discharge. Consequently, the facility will not have effluent limits. The treated waste water from the lagoon will spray irrigated onto an adjacent field of grasses and legumes at appropriate agronomic rates to prevent surface water runoff. The lagoons have been sized to store up to 6 months worth of wastewater produced at the site. Stored wastewater will be sprayed onto 4.27 acres of grasses and legumes using 10 irrigation spray nozzles. The spray irrigation system will have

distribution lines buried throughout the field with the 10 irrigation spray nozzles evenly spaced over the 4.27 acre field. The irrigation nozzles will stand approximately five (5) feet out of the ground and rotate 360 degrees with a single stream spray of treated effluent water. The nozzles will spray the treated effluent water approximately 30 to 40 feet, depending on prevailing winds and the number of nozzles on operation at a given time. The wastewater will be spray irrigated onto the grasses and legumes during the summer months when soil conditions are dry, so as to provide needed moisture. The permit recently issued by IEPA limits the spray irrigation to 0.25 inch per hour, 1.0 inch per day, and 2.0 inches per week. The permit also prohibits spraying when the soils are saturated or during precipitation events. These restrictions have been implemented to prevent runoff from the irrigation field to prevent the contamination of nearby waterways on or off State property. In addition, the irrigation limits are also intended to make sure that the crops or legumes can utilize 100% of the nutrients within the treated wastewater. Without these limits, it would be possible to over-fertilize the vegetation and cause excess nutrients to leach through the soil strata.

The Park Superintendent will be responsible for all spray irrigation practices. All spray irrigation will occur between August 1 and October 31, which is typically the driest time of each year and will avoid the wildlife nesting season. It will likely be 3 years before any treated wastewater is spray irrigated. This is because it will take approximately three years to fill the lagoons to reach peak operating capacity.

The site features of the proposed sewage treatment lagoons system (see Attachment 1C) are as follows:

1. Approximately 10.0 acres is involved in total for the treatment facility
2. The area of the two lagoons (see #3 below for details), access road, parking lot, control building and buffer ground will be fenced (450 ft x 220ft) for a total of 2.27 acres. This area would no longer be available for hunting.
3. The primary lagoon is 180 ft x 130 ft and the secondary lagoon is 130ft x 130ft for a total surface water area of approximately 1 acre.
4. The spray irrigation field is 680 ft x 280 ft for a total surface area of 4.27 acres. The irrigation field would be vegetated with grasses and legumes and contain (10) 5 foot high nozzles for the spraying of effluent. This area would no longer be available for hunting.
5. The sewage treatment system features total approximately 6.54 acres.
6. The remaining 3.46 acres is for the natural buffer around the treatment facilities. This area will be vegetated in warm season grasses and legumes and managed for the production and harvest of game species such as squirrel, rabbits, quail, deer and dove.”

The capital costs associated with the proposed collection system are the same no matter what type of treatment system is chosen. The estimated cost of the proposed collection system includes installing six (6) grinder pump stations, one at each source of wastewater (i.e. campground shower building combined with the camp host site, the fish cleaning station, a flush toilet building, the

sanitary dump station, the concession building, and the site office complex), and small diameter force mains throughout the park is \$195,000. This estimate is approximately 35% of the overall budget. The grinder pump stations will be installed in manholes immediately down gradient of each of the wastewater sources.

The estimated cost to complete Alternative A, the preferred alternative, is \$385,000. This cost estimate includes the construction of a 2-stage earthen lagoon system, pumps, piping, rip rap, fencing, spray irrigation field, etc., in the existing agricultural field west of the abandoned township road the marsh.

The preferred alternative involves a proposed land swap. Since the proposed site (Tract A) for the sewage treatment lagoon is on federal aid acquired land, and within the site's federal aid project boundary, this approximately 10.0 acres parcel must be removed from federal interest. Under the terms of the U.S. Fish and Wildlife Federal Aid grant to IDOC the lands within the federal aid project boundary were acquired for game species habitat, management and hunting. The construction of the proposed sewage treatment lagoon on Tract A, is in conflict with the granted purposes of the federal aid acquired land. Therefore, as part of the preferred alternative Tract B (See Attachment 1A, 1B, and 1C) is proposed for inclusion into the project boundary as a replacement for Tract A, which would be removed from the federal aid project boundary. Removal of Tract A from the federal aid project boundary removes any restrictions on the use of the approximately 10.0 acres for the proposed sewage treatment lagoon.

Both Tracts A and B are within the Beaver Dam State Park boundary. Refer to Chapter 3 for a description of the present condition of each Tract.

### **2.2.2 Alternative B - Pump all Sewage to the City of Carlinville's Wastewater Treatment Plant.**

Alternative B is to pump all wastewater from Beaver Dam State Park to an existing wastewater treatment facility on the south end of Carlinville, Illinois (See Attachment 2). This distance is approximately 6.8 miles from the entrance to the park. The benefits of this option include the following:

1. Site personnel will have very few maintenance requirements. All they will have to do is make sure that both pumps at each of the four (4) lift stations are working properly.
2. No permits are required and no samples will need to be collected or sent to the laboratory. Consequently, labor and laboratory costs will be greatly reduced.

Unfortunately, this option has greater capital costs. These costs include a 4-inch force main and four (4) large lifts stations to push the wastewater between the Park and the City. In addition, the City of Carlinville will likely charge Beaver Dam State Park a monthly service fee for treating the wastes produced at the park. This fee will likely be based on the volume of wastes which enter

Carlinville’s treatment plan from the Park. Currently, the City charges their own residents \$3 for every 1000 gallons of wastewater. The actual fee charged to Beaver Dam State Park, and all other sanitary customers outside of the City limits, is established by the city council on a case-by-case basis. Using \$3/1000 gallons sewage as the basis, Beaver Dam State Park could be charged \$900 per month based on an estimated flow rate of 10,000 gal/day. Over 20 years, which is the life expectancy of the lagoon system, this amount grows to \$216,000.

The capital costs for alternative B include:

37,000 feet of 4" diameter Schedule 80 PVC Force main, bored 42 inches below the surface at a cost of \$12 per foot.	\$444,000
4 heavy duty lift stations with lead and lag pumps (\$75,000 each)	\$300,000
Bring in power supply to each lift station (\$10,000 each)	<u>\$ 40,000</u>
Total cost of alternative B	\$784,000

At least four (4) large lift stations will be required to push the wastes a distance of 6.8 miles because of hilly terrain within the first few miles near the Park. When added to the monthly sewage treatment fees charged by the City of Carlinville, this alternative becomes more expensive than alternative A.

**2.2.3 Alternative C - Purchase 10 Acres and Construct Sewage Treatment Facility**

This alternative is very similar to alternative A (See Attachment 3). The main difference is that the location of the proposed lagoons is not on land currently owned by IDNR. In order for this alternative to become a reality, the current owner of the property would have to be willing to sell his property to the State of Illinois. Thus far, the owner is not willing to sell. Currently, most of the land is in crop production.

The location of alternative C would require about an additional ½ mile of force main. In addition, a large lift station would be required to push the wastewater approximately 40 feet higher than the elevation of the lagoons in alternative A.

The estimated costs for Alternative C include:

Basic lagoon, pumps, pipe associated with Alternative A	\$385,000
2500 Ft of additional PVC piping @ \$12/ft	\$ 30,000
Heavy duty lift station	\$ 75,000
Power supply to lift station	\$ 10,000
Purchase 10 acres @ \$3,000/acre	<u>\$ 30,000</u>
Total cost of Alternative C	\$530,000

Based on the fact that the property owner north of Beaver Dam State Park is not willing to sell the State 10 acres, and due to additional construction costs because of distance and topography, this alternative is more costly than Alternative A and could require lengthy negotiations in a effort to secure the land. This alternative will also involve higher utility costs to pump the wastewater 40 feet higher onto adjacent property

### 2.2.4 Alternative D (No Action)

This alternative will be implemented by the USFWS if the Regional Director, in consultation with the appropriate State Fish and Wildlife agency, determines that the proposed land trade and construction of the sewage treatment facility meets a condition specified under 40CRF 1508.18 or 1508.27 or 550 FW 3.3B (2) and that a site-specific EIS needs to be prepared.

If the Service selects this option, the projected action of the Illinois Department of Natural Resources to resolve the sewage issue at Beaver Dam State Park, will be to make a decision from the following options.

1. Allow all sources of wastewater to continue discharging, unabated.
2. Close the park to all recreational activities, including hunting.
3. Pay a private septic hauler to permanently haul all wastewater from the park.

### 2.3 Summary of Alternative Actions Table

	Description	Highlights	Cost
Alternative A	Sewage lagoon & spray irrigation sewage treatment system on current PR ground	Most economical solution, 6.54 acres of public hunting ground lost, 10.0 acres of federal aid land obligation transferred to the State of Illinois, 10.0 acres of park land to be put into federal aid project boundary	\$385,000 <sup>(1)</sup>
Alternative B	Pump all wastewater to Carlinville	Easiest to design and develop. Very high long term costs No on-site treatment facility	\$784,000 <sup>(1)</sup>
Alternative C	Purchase land north of park and construct lagoon system	Additional land not currently available. Higher construction costs. Higher operating costs.	\$530,000 <sup>(1)</sup>
Alternative D	No Action	Environmental degradation from sewage effluent which does not meet standards continues unabated.	N/A

- (1) In addition to the cost associated with the sewage treatment system described for the given alternative, the cost of the sewage collection system is estimated to be an additional \$195,000. The cost includes the installation of six (6) grinder pump stations and a small diameter force main throughout the park to collect sewage from the campground shower building, the camp host site, fish cleaning station, flush toilet building, sanitary dump station, concession building and the site office-maintenance complex.

## Chapter 3      **Affected Environments**

### 3.1      **Physical Environment**

Beaver Dam State Park in west-central Illinois is found within a moderately dissected glacial till plain of Illinoisan and Kansan age. This part of the state was predominately forest at the time of settlement, but there was considerable prairie on the level uplands (Schwegman, et al 1973).

There are four parcels under consideration to thoroughly detail and characterize the affected environments of this project request. The first, Tract A, (Alternative A-see Attachments 1.A., 1.B. & 1.C.) is a 10.0 acre parcel proposed for removal from the United States Fish and Wildlife Service Federal Aid Project (W-69-L) for the purpose of development into a wastewater treatment lagoon. This area lies within a small valley and is predominately cropland with a narrow strip of bottomland trees (Sycamore, silver maple, cottonwood and green ash) along the eastern boundary and two small triangular shaped blocks of upland hardwood forest (white oak, post oak, shagbark hickory and wild black cherry) in the northeast and northwest corners of the tract. The parcel consists of predominately one soil type (333 Wakeland silt loam), but a small segment of 8D2 Hickory loam is found in the northwest corner of the tract. The area is included as part of our annual cropping plan. The field is in a corn and soybean rotation and no fall tillage is allowed.

The wildlife habitat value of this area is several fold. One of the objectives is to maintain an open habitat condition free of woody development and canopy closure. The fact that the open area is maintained as an annual grain crop provides brood-rearing cover and food sources (insects, weed seeds, forages and annual cover) for bobwhite quail, wild turkey, deer, squirrel, mourning dove, racoons, woodchucks, and an assortment of altricial birds brooding their young in nearby woody or grassland cover. During a cropping year of corn, the cropping plan requires the tenant to leave 5% of the corn unharvested for wildlife winter food. This field would provide a component (0.25 to 0.50 ac) of that total 5% standing corn. The annual disturbances to the soil via tillage or no -till planting stimulates weed developments and subsequent insect attraction repeating the cycle. The amount of area in this portion of the park maintained for the previously described objectives has been reduced proportionally over the past 8 years from 104 acres to 79 acres. It is important to maintain this component for the objectively managed game species and the hunting programs currently in place.

The second, Tract B, (Alternative A-See Attachments 1A, 1B and 1C) proposed for inclusion into the W-69-L project is of rolling topography defined by two soil types. Hickory silt loam (8s) comprises 90 percent of the parcel and Fayette silt loam (280B) completes the balance of the area.

Forest cover is of closed canopy central hardwood or oak hickory type, regenerated, and generally stable with minimal erosion. This parcel is adjoined by contiguous upland hardwood forest to the west (Privately-owned) and east (state-owned), and a buttonbush dominated marsh to the north. The south side is bordered by a township road which is the park's south boundary. This area exhibits greater biological diversity than the first parcel and provides high quality wildlife habitat.

The third tract (Alternative B - See Attachment 2) proposed for development of a force main with lift station pumps would be a narrow linear corridor developed along existing park roadways and in the right of way of public roads between Beaver Dam State Park and Carlinville, Illinois. This alternative would entail minimal disturbances to existing habitat although due to the hilly terrain of the park, a larger amount of pipe would have to be installed.

The fourth parcel (Alternative C See Attachment 3) lies directly to the north of existing park property and is currently privately owned. This alternative would require the purchase of a minimum of 10 acres from a owner who is currently unwilling to sell. This parcel is entirely in a row crop production and consists of a relatively flat to gently rolling topographic feature dominated by two soil types (17 Keomah silt loam and 199C2 Elco silt loam). This tract is in an annual corn and soybean rotation. The entire area is harvested annually at the conclusion of crop development, leaving typical residue on the field surface until the next cropping cycle. The wildlife habitat value to the agricultural field is similar to those of Tract A describe. However no corn is left unharvested as is done on Tract A.

## **3.2 Biological Environment**

### **3.2.1 Habitat Vegetation**

The two parcels (Alternative A) under consideration for exchange are biologically different. The current parcel, Tract A, proposed for removal from the federal aid boundary (W-69-L) (Attachment 1.A.) consists of an annual crop of soybeans or corn and associated annual weeds, two relatively small components of upland hardwood trees, a narrow corridor of mature bottomland trees consisting predominately of sycamore and cottonwood and associated herbaceous wetland plants along the wooded corridor.

The parcel (Alternative A) proposed for exchange into the federal aid boundary is dominated by an upland hardwood forest (Attachment 1.A. & 1.B). Biological diversity for this Tract B is higher than the previously described site. Woody composition includes at least 15 tree species and shrub and vine species such as hazelnut, bush honeysuckle, poison ivy, Virginia creeper, grape and black raspberry. From an inventory (personal communication J. Churan, Illinois Department of Natural Resources Division of Forest Resources, January 2002), the stand is dominated by a combination of white, black, and post oak. Several snag trees (>1 per acre) exist in this parcel. Some exotic species encroachment is evident, but does not pose a major negative impact. Exotic species include Japanese honeysuckle along the south perimeter edge and a few scattered small clumps of bush honeysuckle.

The parcel from Alternative B is a linear corridor of park roadway right-of-way consisting of maintained turf grasses and some forested edge (Attachment 2). Although the initial disturbance would be minimal, those areas would be reseeded to cool-season turf grasses and restored to weekly mowing maintenance during the growing season.

The parcel identified for Alternative C is dominated by open cropland (Attachment 3).

### 3.2.2 Listed Species

No known federal or state listed, proposed or candidate threatened or endangered species are associated with the cropland area (Alternative A & C) or the road right-of-way (Alternative B) (Illinois Natural Heritage Database 2002). Although 1987 surveys recorded the federally and state endangered Indiana bat within one mile of crop field (Alternative A) (Illinois Natural Heritage Database, 2002), no follow up survey has been conducted.

A 1987 report said a lactating Indiana bat (*Myotis sodalis*) was found during a mist netting survey along Macoupin Creek in August, 1987 by Illinois Department of Conservation staff. The roost tree ( a dead post oak) was located approximately 3 miles west/northwest of Beaver Dam State Park in a grazed, upland pasture located in Brushy Mound Township. This is the only record of Indiana bats in Macoupin County currently documented within the Illinois Department of Natural Resources (IDNR) Biological and Conservation database.

The federally and state threatened bald eagle is occasionally observed, but no nesting sites or winter roosts are documented in the general vicinity (Illinois Natural Heritage Database, 2002) of Beaver Dam State Park. Bald Eagles (*Haliaeetus leucocephalus*) typically construct their nests near large rivers and/or substantial bodies of water covering several thousand acres. There are no records of nesting bald eagles in Macoupin County currently documented within the Illinois Department of Natural Resources (IDNR) Biological and Conservation database. Macoupin County is predominantly agricultural in nature and consists of narrow isolated patches of wooded riparian cover. In addition, Beaver Dam State Park and Alternative A, B and C are located a minimum of 50 miles from suitable nest sites along the Illinois, Mississippi, and Kaskaskia Rivers.

No known federal or state listed, proposed or candidate threatened or endangered species are associated with the proposed parcel for inclusion in the federal aid project boundary (Alternative A.) However this site could possibly provide summer habitat for the Indiana bat and wintering habitat for bald eagle. The state endangered Large Ground Plum and state threatened Prairie Trout Lily found within Beaver Dam State Park are described as prairie or open woodland species. Both species are located within ½ mile of this area.

A Phase I, Section 7 (See Attachment 6) was prepared for the alternatives presented in this environmental assessment. The determination made in that document was “Not Likely to adversely Affect” since it was determined that the four alternatives presented under this environmental

assessment would not directly or indirectly affect individuals of listed proposed candidate species or designated proposed critical habitat of such species.

### **3.2.3 Other Wildlife Species**

The biological diversity of Tract A (Alternative A) is relatively minor. Although the cropland area is frequently utilized by wildlife species which include, but are not limited to bluejay, red-headed woodpecker, downy woodpecker, tufted titmouse, chickadee, cardinal, nuthatch, fox squirrel, raccoon, opossum, barred owl, screech owl, red-tailed hawk, wild turkey, white-tailed deer, coyote and red fox deriving available foods, e.g. grain, weed seeds, and insects. The upland hardwood segments and the narrow wooded corridor provide some possible nesting areas, roosting sites and dens for raccoon, squirrel, wood duck, screech owl or barred owl. Upon the completion of the crop harvest, usually by mid-October, utilization of crop residue by game and non-game wildlife declines dramatically. In a year that corn is planted in this field, some standing corn may be left to supplement a winter food source for wildlife. Standing corn usually encompasses ½ -1 acre in this specific area.

The parcel, Tract B (Alternative A), proposed for inclusion in the federal aid boundary at Beaver Dam State Park has wildlife species which include, but are not limited to bluejay, red-headed woodpecker, downy woodpecker, tufted titmouse, chickadee, cardinal, nuthatch, fox squirrel, raccoon, opossum, barred owl, screech owl, red-tailed hawk, wild turkey, white-tailed deer, coyote and red fox.

The wildlife benefits associated with the narrow corridor along the Shipman Blacktop under Alternative B would include foraging areas for song bird species commonly associated with a forest edge. With minimal disturbance, no long term impacts or detriments would be recognized.

For Alternative C, the biological diversity of the site is relatively minor although the cropland is probably utilized by browsing deer, wild turkey, squirrel and various songbirds. At the conclusion of crop harvest, crop residue use by wildlife declines dramatically. This parcel is in private landownership and the application of wildlife values is limited and strictly incidental.

### **3.3 Land Use**

The two parcels proposed for exchange (Alternative A) exemplify different land uses, but do have a common denominator. They are both open and accessible to non-consumptive and consumptive outdoor users. 9.6 acres of the 10.0 acre parcel (Tract A) proposed for removal from the federal aid project boundary is utilized for annual crop production. The small upland hardwood forest tracts provide nesting and denning sites for wildlife as well as food in the form of hard mast. These forest areas will not be affected by any development. The narrow tree corridor is a travel corridor and aesthetic barrier for marsh observers. A small area (50'-60' wide) of this tree corridor will need to be removed to provide access to the proposed waste water treatment facility from the existing access road within the park.

3.45 acres of Tract A (10.0 acres), which will be converted to grasses and legumes as a natural buffer around the fenced-off area, will remain open to the public for hunting purposes if the land exchange is approved. 2.27 acres will be fenced off for public safety and will include the control building, parking lot, access road and sewage lagoons and therefore not be open to hunting. The other area which would be removed from hunting would be the 4.27 acre spray irrigation field for the sewage effluent removed from the lagoons (see Attachment 1A).

The loss of the 9.6 acres of agricultural ground coupled with the reduction in agriculturally leased ground (wheat, corn and soybean rotation) over the past 8 years from 104 acres to 79 acres has not adversely impacted the available winter food energy sources at this site. The reduction in farmed acres has been countered by incorporating into the agricultural lease a request to leave 5% of the annual corn planted standing all winter. This practice is a bonus, but not a critical overwintering requirement for maintenance of game species. The reduction in this additional acreage due to the proposed construction of the sewage treatment facility and subsequent potential reduction of standing corn by 0.25-0.50 acres (15-20 bushel) is insignificant.

The current crop lease expires in 2003 and based upon the biologist's assessment of the corn remaining on the stalk in late March, adequate winter energy source is being provided. If the winter energy source does prove inadequate, based on future evaluations, then the percent of corn left standing can be changed from 5% to 7% or 8% to provide additional food or the total corn planted acreage can be increased at the sacrifice of soybeans. Furthermore, the replacement area (Tract B) can also be improved by some additional soft mast shrub plantings on the periphery. Timber stand improvement is already underway on P-R lands and non-P-R lands at Beaver Dam State Park which will also improved habitat and food sources for the production and harvest of squirrel, rabbits, quail, deer and dove and other non-game species.

Construction of the sewage treatment facility will create a visual and odor intrusion in the area of the proposed facility. To minimize the visual intrusion, the 2.27 acre fenced area will be surrounded by a naturalized buffer of warm season grasses and legumes. Furthermore, the sewage lagoons will be bermed to reduce direct view of the sewage effluent. The 4.27 acre spray irrigation field will be planted in grasses and legumes, which will minimize the visual impact of that portion of the treatment facility (see Attachment 1A).

Odors from the treatment lagoons and the spray irrigation field system will occur with little to no abatement. The frequency, intensity and duration of any odors associated with the proposed sewage treatment facility is influenced by temperature, wind and the effluent. Prevailing winds in this area are from the west to northwest. Any odors will generally be blown east to southeast of the proposed treatment facility, away from the federal aid public hunting area, and towards the marsh area. Some amelioration of the odors can be expected from the existing tree line along the roadway. As the air carrying the odors passes through the treeline the concentration of odors will be diffused and dissipated thus reducing the impact odors will have to hunters or other users in this marsh and the park lands south of the marsh (see Attachment 1A).

The 10.0 acre parcel (Tract B) proposed for inclusion into the project is composed of high quality upland hardwood forest. This area is more biologically diverse than the crop land parcel. However, this area does not contain any croplands for the production of wildlife food energy. This area is currently open to hunting activities at the state park. The four major hunting programs include squirrel, archery deer, spring wild turkey and fall archery wild turkey. These species are common to upland hardwood habitats and derive benefits year round from the tract proposed for inclusion into the W69-L project.

The land use impacted to vehicular traffic using the public roads by Alternative B will be minimal disturbance of traffic flow during construction and a relatively short recovery period subsequent to any ground disturbance. Only short term impacts by vegetation disturbance would be anticipated, none of which would dramatically impact associated wildlife species.

Land use changes resulting from Alternative C would include the conversion of existing annual cropland to a series of wastewater lagoons which could improve existing habitat conditions for some avifauna and herpetofauna. Adjoining available cropland would provide the habitat needs of any species that might be displaced by this development.

Odors from the treatment lagoons and the spray irrigation field system under Alternative C will occur with little to no abatement. The frequency, intensity and duration of any odors associated with the proposed sewage treatment facility is influenced by temperature, wind and the effluent. Prevailing winds in this area are from the west to northwest. Any odors will generally be blown to the east to southeast of the proposed treatment facility towards the camping and picnicking areas of the park. Tree mass in the area of the campgrounds and the picnic area will help to dissipate the odor.

### **3.4 Cultural/Paleontological Resources**

There was a systematic archaeological survey of Beaver Dam State Park conducted in 1981. There are no documented major archaeological or historic structures located in "Tract B" or "Tract A" (Attachments 1A, 1B, and 1C). The proposed passive, wildlife habitat use will not have an affect on any major cultural resources. The proposed 50 foot corridor adjacent to the existing roads throughout the park for the sewage collection piping system does not contain any major cultural resources.

Prior to the implementation of any project, clearance from the Illinois Historical Preservation Agency and Native American Tribes with standing in Illinois will be secured. All work will be done in accordance with the 1993 Programmatic Agreement among the U.S. Department of Interior Fish and Wildlife Service, the Advisory Council on Historic Preservation and the Illinois Historical Preservation Agency, as amended 9/23/02.

## Chapter 4      **Environmental Consequences**

### 4.1      **Alternative A (Proposed Action) - Construct Sewage Treatment Facility in Agricultural Field**

#### 4.1.1      **Habitat Impacts**

The proposed action consists of an exchange of equal acreage. Removing Tract A, a 10.0acre parcel of 95 percent cropland (9.6 acres) and a narrow linear tree corridor from the project (W-69-L) and adding Tract B, a 10.0 acre parcel consisting entirely of high quality upland hardwood forest (refer to Attachments 1A, 1B & 1C). A higher diversity of species would benefit throughout their yearly life cycles from the addition of Tract B. The parcel (Tract A) removed from the project would perceivably invoke some interim negative habitat impacts by the conversion of the crop field to waste water treatment lagoons and spray irrigation field with permanent vegetation of grasses and legumes. A segment (50'-60' wide) of the existing tree corridor would be cleared for access to the lagoon system. This would likely disrupt the travel lane in the interim. Before construction begins, the project site will be examined by a person with extensive research and management experience with Indiana bats. If any trees having exfoliating bark or cavities suitable for use by Indiana bats are slated for removal, removal of those trees will only occur between October 1<sup>st</sup> and March 30<sup>th</sup>. Trees over 20 cm dbh will be removed only if inspection of those trees reveals no evidence of use as a maternity site (e.g. guano accumulation, straining). Some habitat benefits would likely be derived by herpetofauna and avifauna from the development of an additional permanent water body in the form of the sewage lagoons. Wetland associated birds would likely utilize the additional permanent water body. Songbirds and small mammals associated with the adjoining forest and cropland edges would also benefit to some degree. The natural buffer and irrigation spray field of grasses and legumes will be of a benefit by providing nesting and cover for small upland game, deer fawn, birds, etc.

To minimize disturbance to existing habitat, all force mains near existing park facilities will be directionally bored. This includes all sewer mains near the roads, parking lots, boat ramps, dump station, shower building and camp ground. The force mains will be directionally bored approximately 72" deep throughout the park in order to avoid buried power lines, water mains, telephone line and other improvements. In addition, by boring this deep, we avoid most of the vegetation and will not have to remove trees to provide a pathway for the trencher.

Approximately 1400 feet of 3 inch force main will trenched 48 inches under ground. This portion of the project is located between the sanitary dump station and the wastewater treatment lagoon. Most of the force main will be trenched down the middle of an existing foot trail which allows pedestrians to walk around the marsh. No trees will be demolished since the trail has adequate width to lay the 3 inch sewer main.

#### 4.1.2 Biological Impacts

The wildlife habitat value post-project (sewage treatment facility) will provide is some additional benefits for a different list of targeted species, though this area will be removed from the federal aid project boundary. The lagoon system with a fenced perimeter will reduce some predation by mammals of amphibians and some reptiles. It will however, most likely not impair avian predators. A 5 acre marsh already exists approximately 100' directly to the east of this location. There is also some potential for wetland associated avifauna to utilize some perimeter grassy areas for nesting that may be somewhat predator free. The proposed irrigation field developed to some type of grassy cover could also provide some additional nesting benefits. Mowing as a planned management practice of the proposed grassy cover in the natural buffer and spray irrigation field along with the operation of the spray irrigation system will be delayed until after August 1 annually to avoid nesting season impacts on birds, rabbits, fawns, etc. which may be using the 4.27 acre spray irrigation field area.

The flow rates at this site are low enough that all treated wastewater can be spray irrigated onto growing grasses and legumes. The lagoon has been sized to store up to 6 months worth of wastewater produced at the site. Stored wastewater will be sprayed onto 4.27 acres of grasses and legumes using 10 irrigation spray nozzles. The spray irrigation system will have distribution lines buried throughout the field with the 10 irrigation spray nozzles evenly spaced over the 4.27 acre field. The irrigation nozzles will stand approximately five (5) feet out of the ground and rotate 360 degrees with a single stream spray of treated effluent water. The nozzles will spray the treated effluent water approximately 30 to 40 feet, depending on prevailing winds and the number of nozzles on operation at a given time. The wastewater will be spray irrigated onto the grasses and legumes during the summer months when soil conditions are dry, so as to provide needed moisture. The permit recently issued by IEPA limits the spray irrigation to 0.25 inch per hour, 1.0 inch per day, and 2.0 inches per week. The permit also prohibits spraying when the soils are saturated or during precipitation events. These restrictions have been implemented to prevent runoff from the irrigation field to prevent the contamination of nearby waterways on or off State property. In addition, the irrigation limits are also intended to make sure that the crops or legumes can utilize 100% of the nutrients within the treated wastewater. Without these limits, it would be possible to over-fertilize the vegetation and cause excess nutrients to leach through the soil strata.

The Park Superintendent will be responsible for all spray irrigation practices. We anticipate that most irrigation will occur between August 1 and October 31, which is typically the driest time of each year and will avoid the wildlife nesting season. It will likely be 3 years before any treated wastewater is spray irrigated. This is because it will take approximately three years to fill the lagoon to its peak operating capacity.

#### **4.1.3 Listed, Proposed, and Candidate Species**

The U.S. Fish and Wildlife Service's Southern Illinois field office was contacted in regards to treatment and endangered species under this environmental assessment. Service representative, Joyce Collins, indicated more details were needed in regards to potential impacts to the Indiana bat or bald eagle, if any, with regards to the amount of tree clearing necessary for lagoon construction and sewage pipeline construction should be identified, including the potential for impacts to roosting trees. In addition, as this species often forages over aquatic areas, there should be some discussion regarding the effluent discharge and its affects on overall water quality and how this may affect the Indiana bat.

The following information is provided in response to those questions. The proposed wastewater treatment lagoon will be constructed in an open corn field and the wastewater collection will mainly follow existing roadway and paths within the park, which will result in minimal tree clearing. A segment (50'-60' wide) of the existing tree corridor would be cleared for access to the lagoon system. Before construction begins, the project site will be examined by a person with extensive research and management experience with Indiana bats. If any trees having exfoliating bark or cavities suitable for use by Indiana bats are slated for removal, removal of those trees will only occur between October 1<sup>st</sup> and March 30<sup>th</sup>. Trees over 20 cm dbh will be removed only if inspection of those trees reveals no evidence of use as a maternity site (e.g. guano accumulation, straining). As Macoupin Creek and its related branches, as well as numerous small lakes are located within a 3 mile radius of Beaver Dam State Park, it is highly unlikely that any Indiana bats foraging in and around Beaver Dam State Park will prefer to drink from the two sewage lagoons constructed in an upland, agricultural context.

The proposed wastewater treatment lagoon will be constructed in an open corn field, which will result in minimal tree clearing. Only a small number of trees will be destroyed in order to construct an access road and the wastewater collection system. Removal of these trees will not affect the bald eagle or any aspect of its life cycle in Illinois.

#### **4.1.4 Cultural Resources**

As per Section 3.4, there are no known cultural or paleontological resources present within the proposed sewage treatment lagoon site or the wastewater collection system corridor, therefore no impacts are anticipated.

#### **4.1.5 Environmental Justice**

There are no anticipated disproportionate affects on economically disadvantaged citizens or minorities in regards to this alternative.

#### 4.1.6 Cumulative Impacts

Construction of the sewage treatment lagoon at Tract A would result in the permanent loss of approximately 6.54 acres of public hunting lands within Beaver Dam State Park. The 6.54 acres lost to hunting occurs in two areas of the proposed sewage treatment facility:

- 2.27 acres which will be fenced off and include the control building, parking lot, access road and two sewage treatment lagoons
- 4.27 acre spray irrigation field for the effluent removed from the sewage treatment lagoons

The remaining 3.46 acres within Tract A will be open for hunting since Illinois law does not prohibit hunting or shooting near fencing or unoccupied structures. The 6.54 acres permanently lost to public hunting is more than off-set by the addition of 3,655 acres of hunting lands managed by the IDNR in Region 4 between the 2000/01 hunting season of April 1, 2000 to March 31, 2001 and the 2001/02 hunting season of April 1, 2001 to March 31, 2002. Beaver Dam State Park is located in Region 4 so the 3,655 acre increase in public hunting lands in the area off-sets the minor loss of public hunting acreage as a result of implementing the proposed action.

The development of the proposed sewage treatment system outline under this alternative is not expected to have any major impact to the hunting opportunities or the number of hunters using the site. The minor loss of 6.54 acres from the total of 450 acres of public hunting lands available at Beaver Dam State Park represents only a 1.5% reduction of hunting acreage at the site. Furthermore, the IDNR has added an additional 3,655 acres of public hunting lands in their Region 4, which is where the Beaver Dam State Park is located. That large infusion of public hunting lands further reduces any impact the loss of the 6.54 acres could have to the hunting opportunities available to the public.

The treated wastewater from the sewage treatment lagoons will be spray irrigated onto and adjacent field planted into grasses and legumes so no discharge will occur which means that downstream impacts are eliminated. There will be no point discharge from this facility. All excess wastewater will be spray irrigated onto growing grasses and legumes at the appropriate agronomic rates, as permitted by IEPA. No vegetation sprayed with the effluent will be harvested for human consumption or for commercial livestock production. The vegetation will be available for wildlife foraging, which poses no adverse impacts to wildlife since all pathogens which may be present in the raw sewage will be neutralized within the treatment system. The Illinois Environmental Protection Agency has established hourly, daily, and weekly spray irrigation limits to minimize the potential for any harm to the wildlife or vegetation which will be strictly adhered to by the park staff operating the treatment system.

There are obvious trade-offs for wildlife from Pre to Post Project development in the agricultural field. Different species will benefit from the development of the sewage lagoons and spray

irrigation field once previously described management practices are applied. The habitat benefits of Post-Project in the area of the sewage treatment lagoons and spray irrigation field may decline for the objective game species, but increase for non-game species.

Long term, there could be an increase in park attendance if future capital expenditure are appropriated to expand existing recreational facilities on the non-federal aid portion of the site. The likely improvements would be the construction of additional class A camping facilities (i.e. sewer and water hook-ups), a second shower building or an enlarged concession building. Before any of these improvements could occur, the sewage treatment system will have to be operational.

## 4.2 Alternative B - **Pump all Sewage to City of Carlinville Wastewater Treatment Plant**

### 4.2.1 **Habitat impacts**

There would be minimal disturbance to habitats since the sewage collection system within the Beaver Dam State Park would be installed mostly by means of forced mains adjacent to existing roadways. Outside of the park, the sewage force main would run along the right of way of existing public roads (see Attachment 2) to the Carlinville sewage treatment plant. These right of way habitats are mainly monocultures of cool season grasses which are mowed regularly.

This action would generally cause some minimal disturbance during construction. Any disturbed habitats would recover in a relatively short period of time post construction. There would be no additional habitat benefits to avifauna or herpetofauna derived from this action. This alternative would entail installing approximately 7 miles of pipe and associated lift station pumps through the rolling topography between Beaver Dam State Park and Carlinville, Illinois.

### 4.2.2 **Biological Impacts**

All wastewater from Beaver Dam State Park will be collected and treated to IEPA standards. During peak season (April-October) the amount of wastewater generated by Beaver Dam State Park will increase the amount of raw sewage to be treated by the Carlinville sewage treatment plant and the volume discharged from that plant. However, all effluent will meet current IEPA treatment standards so no biological impacts are anticipated.

### 4.2.3 **Listed, Proposed and Candidates Species**

No listed, proposed or candidate species, or designated, proposal critical habitat of such species will be directly or indirectly affected by this alternative. See the Phase I, Section 7 (Attachment 6) for details.

#### 4.2.4 Cultural Resources

No known archeological or paleontological resources will be impacted by the Alternative B. See Section 3.4 for Beaver Dam State Park. The public road right-of-way has been previously disturbed with road improvements and utility installations. However, if resources are encountered, they will be avoided during construction.

#### 4.2.5 Environmental Justice

There are no anticipated effects to economically disadvantaged citizens or minorities in regards to this alternative.

#### 4.2.6 Cumulative Impacts

Construction of a sewage force main between Carlinville, Illinois and Beaver Dam State Park will create a potential development corridor. The seven mile corridor between the City of Carlinville and Beaver Dam State Park is mainly rural with single family residences associated with farming. With a sewage main along with existing roads, subdivisions and associated commercial growth (i.e. gas stations, convenient marts, etc.) could begin appearing especially adjacent to Beaver Dam State Park due to its natural amenities. Such increased urbanization would detract from the park's natural setting and could affect wildlife in and around the park over time.

### 4.3 Alternative C-Purchase 10 Acres and Construct Sewage Treatment Facility

#### 4.3.1 Habitat Impacts

The development of an open water lagoon system with associated effluent irrigation field in the described 10 acre cropland area, which is on private property north of Beaver Dam State Park (see Attachment 3), could provide some positive habitat benefits for some avifauna and herpetofauna. Wetland associated birds and mammals would likely utilize the additional permanent water body. Land use impacts from annual disturbance would likely be reduced by a permanent wetland habitat development.

There would be minimal habitat disturbance from the construction of the sewage collection system within Beaver Dam State Park since it would be installed mostly by means of forced mains adjacent to existing roadways

#### 4.3.2 Biological Impacts

The potential impacts are the same as previously covered in Section 4.1.2 above since this would be the same type of force main sewage collection system to a wastewater treatment lagoon with a spray irrigation field as described there.

#### **4.3.3 Listed, Proposed, and Candidate Species**

The potential impacts are the same as previously covered in Section 4.1.3 above since this would be the same type of force main sewage collection system to a wastewater treatment lagoon with a spray irrigation field as described there.

#### **4.3.4 Cultural Resources**

As per Section 3.4, there are no known cultural or paleontological resources present within the proposed sewage treatment lagoon site or the wastewater collection system corridor within the park, therefore no impacts are anticipated. However, if resources are encountered during construction, they will be avoided.

#### **4.3.5 Environmental Justice**

There are no anticipated effects to the economically disadvantaged or minorities in regards to this alternative.

#### **4.3.6 Local Socio-Economic Conditions**

This alternative requires the purchase of approximately 10 acres of agricultural field from a private landowner adjacent to the northern boundary of Beaver Dam State Park. The landowner is not interested in selling his property, and a taking under eminent domain powers is not likely. Therefore lengthy negotiations would be needed which often result in further land speculations and increased land values as adjacent landowner anticipate possible future purchases by the government.

#### **4.3.7 Cumulative Impacts**

Treated wastewater from the sewage treatment lagoon system will be spray irrigated onto adjacent row crops or legumes at IEPA approved rates so no discharge will occur to create any possible downstream impacts.

This type of sewage treatment system does have trade-offs for wildlife. The current agricultural field benefits upland game species such as rabbits, pheasant, deer, quail, etc. Along with non-game species such as rodents, song birds, and insects. Development of the sewage treatment system will, over time, favor the non-game species, thus reducing suitable habitat for the game species.

This alternative also has the cost of additional land purchase associated with it. Locally such action would mean another 10 acres of land is removed from the property tax base since it would go into government ownership. In addition to the loss of tax revenue, there is often a perception that government is conducting a “land grab” at the expense of local private landowners. Such

action can foster poor public relations and drive land values up due to speculation over possible future purchases.

This alternative has a higher construction cost compared to Alternative A, which is the same treatment system constructed onsite. This alternative takes the sewage from the collection system and directs it north which is generally up-hill and through more rolling terrain to reach the proposed 10 acre field for the treatment lagoon and effluent irrigation spray system. Increased construction costs here for this alternative means less money is available for other projects of equal importance thus causing possible impacts in other facilities since there was not adequate funds available to abate them.

#### 4.4 **Alternative D - No Action**

##### 4.4.1 **Habitat Impacts**

The impact to habitat under this Alternative would be the continued degradation of the wetland marsh water quality and downstream receiving waterway (See Attachment 5). The existing wetland is a shallow marsh with a fluctuating water level that seldom exceeds three (3) feet. The physical condition of the wetland allows sunlight to penetrate virtually all standing water areas of the marsh. Periodic infusions of nutrient- enriched, sewage effluent into this sunlight, watery ecosystem dramatically accelerates the normal biological process. Aquatic growth increases, oxygen levels in the water decreases, turbidity increases, and the water temperature increases in response to each infusion of the sewage effluent. As these dramatic changes occur to the wetland’s aquatic environment in response to the inflow of the effluent, the aquatic plants, insects and amphibians are put under stress due to the dramatic changes in aquatic conditions. Some species of plants, insects and animals may not be able to tolerate these continuous changes and no longer rely on the marsh for habitat and or forage there.

##### 4.4.2 **Biological Impacts**

Currently, the sanitary dump station discharges partially treated effluent into the wetland marsh which then flows into an unnamed tributary of Macoupin Creek west of Beaver Dam State Park. This discharge is an unpermitted discharge. Laboratory samples were collected from the sanitary dump station effluent in March 2000 and June 2000. The results are listed below:

<b><u>Parameter</u></b>	<b><u>March 7, 2000</u></b>	<b><u>June 20, 2000</u></b>	<b><u>Units</u></b>	<b><u>Typical Std</u></b>
CBOD	36.6	216	mg/l	10 mg/l
Fecal Coliform	50,5000	---	#100 ml	400/100 ml
Tot. Susp. Solids	24.5	69.7	mg/l	12 mg/l
Amm. Nitrogen	23.1	338.8	mg/l	1-2 mg/l
pH	7.0	7.4	Units	6.5 - 8.0

Note that the typical effluent standard does not apply for this particular facility since the treatment system does not have a permit. The typical standard is only provided as a reference.

Flow rates from the sanitary dump station are unknown since the existing treatment system is not equipped with a flow meter. Based on the number of Class A camping sites and the average size of trailers at this site, it is estimated that the volume of waste discharged into the dump station is 7500 gallons per week. Unfortunately, 50 - 60% of this volume occurs on Sunday with the remaining volume spread among the other 6 days. Thus, there is a slug of partially treated wastewater which is discharged on Sunday and Monday.

#### **4.4.3 Listed Proposed and Candidates Species**

No listed, proposed or candidate species or designated proposed critical habitat of such species will be directly or indirectly affected by this alternatives. See the Phase I, Section 7 (Attachment 6) for details.

#### **4.4.4 Cultural Resources**

No known archeological or paleontological resources will be impacted by this alternative.

#### **4.4.5 Environmental Justice**

There are no anticipated disproportionate affects on economically disadvantaged citizens or minorities in regards to this alternative

#### **4.4.6 Local Socio-Economic Conditions**

Beaver Dam State Park offers a number of recreational opportunities including camping, fishing, boating, hunting, hiking, etc. making it a very popular park. A number of local business's in the Carlinville, Illinois area rely on the business derived from park users. If the sewage effluent continues, unabated, the quality of the park will be adversely impacted and park usage could decline. A decline in park usage translates into a lose of income for local businesses and a adverse economic impact to the local economy.

#### **4.4.7 Cumulative Impacts**

Implementing this alternative over the short-term will result in the status quo being maintained. Over the long-term, the environmental degradation caused by the continued discharge of untreated sewage will adversely affect the wetland-marsh and the wildlife which depends on that habitat directly or indirectly. The wildlife game species, for which the hunting areas are managed, will be in that group of wildlife adversely impacted. Game species could decline in number and in health if the environmental degradation continues unabated. Loss of game species

coupled with the presence of raw sewage flowing through the Beaver Dam State Park could eventually impact the number and frequency of users. These users will seek alternate sites which do not have such impacts thus putting increased pressure on those alternate sites facilities possibly leading to new environmental impacts.

**4.5 Summary of Environmental Consequences by Alternative (Table)**

Environmental Consequences	Alternative A - Construct Sewage Treatment Facility in Ag Field	Alternative B - Pump all Sewage to City of Carlinville Wastewater Treatment Plant	Alternative C - Purchase 10 Acres and Construct Sewage Treatment Facility	Alternative D - No Action
Habitat	<p>Higher diversity of species would benefit from addition of more biological diverse upland forest parcel (Tract B). Some habitat benefits to avifauna and herpetofauna may occur with the development of permanent water body (Tract A).</p> <p>Minor to Negligible Impact- To game species with loss of food source and cover due to elimination 9.6 ac. of croplands. Grasses &amp; legumes in the proposed natural buffer and spray irrigation field would provide some replacement habitat for game species (deer fawn, rabbits, quail, pheasant, etc.).</p>	<p>Minor Impact - Temporary, short-term effect on habitat associated with roadway</p>	<p>Some habitat benefits to avifauna and herpetofauna may occur with the development of permanent water body.</p> <p>Minor to Negligible Impact- To game species with loss of food source and cover due to elimination 9.6 ac. of croplands. Grasses &amp; legumes in the proposed natural buffer and spray irrigation field would provide some replacement habitat for game species (deer fawn, rabbits, quail, pheasant, etc.).</p>	<p>Noticeable to Major Impacts- Continued discharge of untreated sewage effluent into the wetland marsh and downstream receiving waterway will result in degradation of the marsh as suitable habitat for aquatic species, waterfowl, insects, etc..</p>
Biological				

Vegetation	<p>Noticeable Impacts- Some tree clearing, (50'-60' wide), in existing tree corridor and permanent conversion of ag field (9.6 ac.) to sewage lagoons facility with natural buffer and spray irrigation field.</p> <p>Minor Impacts- Sewage pipeline within the park to follow existing roadways and trails so disturbance limited to mown cool season grasses. Some brushy understory growth and minor tree clearing.</p>	Minor Impacts-Sewage pipeline within the park to follow existing roadways and trails so disturbance limited to mown cool season grasses. Some brushy understory growth and minor tree clearing.	<p>Noticeable Impacts- The permanent conversion of ag field (9.6 ac.) to sewage lagoons facility with natural buffer and spray irrigation field.</p> <p>Minor Impacts- Sewage pipeline within the park to follow existing roadways and trails so disturbance limited to mown cool season grasses. Some brushy understory growth and minor tree clearing.</p>	Noticeable to Major Impacts - Continued discharge of untreated sewage effluent, rich with nutrients will dramatically alter aquatic vegetation within the wetland marsh and the downstream waterway.
Threatened, Endangered & Candidate Species	To avoid any possible impact to Indiana bats before construction begins, the project site will be examined by a person with extensive research and management experience with Indiana bats. If any trees having exfoliating bark or cavities suitable for use by Indiana bats are slated for removal, removal of those trees will only occur between October 1 <sup>st</sup> and March 30 <sup>th</sup> . Trees over 20 cm dbh will be removed only if in spection of those trees reveals no evidence of use as a maternity site (e.g. guano accumulation, straining).	No Effect Anticipated	To avoid any possible impact to Indiana bats before construction begins, the project site will be examined by a person with extensive research and management experience with Indiana bats. If any trees having exfoliating bark or cavities suitable for use by Indiana bats are slated for removal, removal of those trees will only occur between October 1 <sup>st</sup> and March 30 <sup>th</sup> . Trees over 20 cm dbh will be removed only if in spection of those trees reveals no evidence of use as a maternity site (e.g. guano accumulation, straining).	No Effect Anticipated

Other Wildlife Species	Negligible to Minor Benefits to herpetofauna and avifauna from development of permanent water body (Sewage lagoons) in the form of additional habitat.	Minor-Limited wildlife use of road right-of- ways	Negligible to Minor Benefits to herpetofauna and avifauna from development of permanent water body (Sewage lagoons) in the form of additional habitat.	Noticeable to Major Impacts - Continued discharge of nutrient rich sewage effluent will overtime alter the types of aquatic species which can tolerate the water quality of the wetland marsh.
Effluent Discharge	No treated effluent will be discharged. All treatment wastewater from the sewage treatment lagoons will be spray irrigated onto adjacent field of grasses & legumes at IEPA approved rates with 100% of the effluent nutrients utilized by the crops.	All treated effluent would meet IEPA discharge standards for the Carlinville wastewater treatment plant	No treated effluent will be discharged. All treatment wastewater from the sewage treatment lagoons will be spray irrigated onto adjacent field of grasses & legumes at IEPA approved rates with 100% of the effluent nutrients utilized by the crops.	Noticeable to Major Impacts - Untreated sewage effluent will be discharged into the public waters of the United States created potential health hazards
Cultural/Paleontological Resources	None Expected - Archaeological survey of Beaver Dam State Park in 1981 documented no major archaeological or historical structures in the proposed project areas. The required SHPO and Native American tribal consultation clearances will be secured before and construction begins.	None Expected- See Alternate A for Beaver Dam State Park. The public road right-of- way has prior disturbances making cultural/paleontological resources unlikely. If resources are encountered during construction they will be avoided. The required SHPO and Native American tribal consultation clearances will be secured before and construction begins.	None Expected- See Alternate A for Beaver Dam State Park. There are no known cultural paleontological resources in the ag field. If resources are encountered during construction they will be avoided. The required SHPO and Native American tribal consultation clearances will be secured before and construction begins.	N/A
Environmental Justice	No Disproportionate Affect Anticipated	No Disproportionate Affect Anticipated	No Disproportionate Affect Anticipated	No Disproportionate Affect Anticipated

Local Socio-Economic Conditions	N/A	N/A	Minor to Noticeable Impacts - Purchase of private land by government can create speculation of future purchases and artificially inflate land values in the surrounding area.	Noticeable to Major Impacts - Continued discharge of untreated sewage could result in the loss of park users due to declining aesthetic and hunting qualities. A decline in park usage translates into a loss of income for local businesses and a adverse economic impact to the local economy.
Land Use				
Agriculture	Minor Impact- Approx 10.0 acres will be converted from ag field to sewage treatment lagoons with a buffer of warm season grasses and spray irrigation field of grasses & legumes. No grasses or legumes will be harvested for animal feed or human consumption in any form.	N/A	Minor Impact- Approx 10.0 acres will be converted from ag field to sewage treatment lagoons with a buffer of warm season grasses and spray irrigation field of grasses & legumes. No grasses or legumes will be harvested for animal feed or human consumption in any form.	N/A

Recreational	<p>Noticeable Impacts - Approx 6.54 acres will be permanently removed from public hunting ground at Beaver Dam State Park. 3,655 acres of public hunting lands added in IDNR Region 4 thus off-setting the loss.</p> <p>Noticeable to Major Impacts - The proposed sewage treatment facility will create a visual and odor intrusion for hunter and others recreating in the area of the wetland and southern portion of Beaver Dan State Park</p> <p>Minor to Negligible Impact- To game species with loss of food source and cover due to elimination 9.6 ac. of croplands. Grasses &amp; legumes in the proposed natural buffer and spray irrigation field would provide some replacement habitat for game species (deer fawn, rabbits, quail, pheasant, etc.).</p>	N/A	<p>Noticeable Impacts - The proposed sewage treatment facility will create a visual and odor intrusion for the campgrounds and the picnicking area of Beaver Dam State Park.</p> <p>Minor to Negligible Impact- To game species with loss of food source and cover due to elimination 9.6 ac. of croplands. Grasses &amp; legumes in the proposed natural buffer and spray irrigation field would provide some replacement habitat for game species (deer fawn, rabbits, quail, pheasant, etc.).</p>	<p>Noticeable to Major Impacts - The discharge of untreated sewage down the drainageway through the public hunting area could create health hazards and aesthetic issues that will at a minimum, detract from the hunting experience, and result in the loss or reduction of game species.</p>

**Chapter 5 List of Preparers**

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- Ken Litchfield - Office of Realty and Environmental Planning, IDNR
- Mark Phipps - Office of Resource Conservation, IDNR
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- Paul Vehlow - Federal Aid Coordinator, IDNR

## Chapter 6      **Consultation and Coordination with the Public and Others**

Jeff Gosse, USFWS  
Joyce Collins, USFWS  
Hal Hassen, IDNR  
Glen Kruse, IDNR

## Chapter 7      **Public Comments on Final EA/EIS and Response**

Comments: Only one written comment received from a private citizen during the public review period as noted below. He regretted the loss of this piece of land because it was a quiet place to walk, but his comments appear resigned to the decision because there seemed to be no other viable options.

*Subject: Beaver Dam State Park, 04/14/2003 03:17 PM*

*Dear Mr. Parker,*

*I don't hunt, but I do walk and have often enjoyed the quiet of the part of the park slated for the lagoons. I certainly can understand the need for better sewage disposal. It is indeed unfortunate that the gentleman to the north is unwilling to part with 10 acres, but I have lived long enough here to know some things aren't worth the hassle. It is a thousand pities that the state of Illinois is broke, making the Carlinville option unlikely, I suppose.*

*So, I suppose it needs to be done, and the others seem unlikely. So, I'll hold my nose and keep walking.*

Response: Thanked him for the response.

## Chapter 8      **Literature Cited**

Illinois Natural Heritage Database. 2002. Illinois Department of Natural Resources, Springfield, IL. Schwegman, J.E., G.B. Fell, M.D. Hutchinson, G. Paulson, W.M. Shepherd and J. White. 1973, Comprehensive Plan for the Illinois Nature Preserve System. Part 2. The natural divisions of Illinois. Illinois Nature Preserves Commission, Springfield, IL. 32 p.

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Wieda, C. And Willms, P. 2002. Illinois Public Hunting Areas Report, Illinois Dept. of Natural Resources, Public Lands - Hunting Effort and Harvest, 2001-02 Season-01 April 2001 to 31 March 2002. Illinois Department of Natural Resources, Springfield, Illinois. 14p

## Attachments