MOUNDS LAKE

Phase II Feasibility

Executive Summary

February 10th, 2015

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In the fall of 2013, the Anderson Corporation for Economic Development (ACED) was awarded a grant from the Indiana Finance Authority (IFA) to conduct the Phase II Feasibility Study for the proposed Mounds Lake Reservoir. Mounds Lake would be a 2100 acre lake located in Delaware and Madison Counties on the White River, providing billions of gallons of additional water storage for central Indiana. If completed, the City of Anderson and the Towns of Chesterfield, Daleville and Yorktown would have Mounds Lake as a part of their communities.

Based on reviews of available water resource studies conducted over the last 15 years by municipalities, utilities and stakeholder organizations, there is a need for additional water resources in central Indiana. Mounds Lake is a needed component of the central Indiana water infrastructure for drought preparedness as well as an additional resource to support future growth. If built, Mounds Lake would be strategically located to efficiently supply water to the fastest growing, most densely populated part of the state. The Phase II Feasibility Study concludes that it is possible to engineer and construct Mounds Lake. Furthermore, the initial financial analysis demonstrates that the project can be funded by providing a regional water supply to areas that are currently underserved by existing resources.

First envisioned in a 2010 Madison County Leadership Academy class, Mounds Lake and its 11 billion gallons of water storage capacity has the potential of becoming a vitally important component of central Indiana's water supply infrastructure. Utilizing conservative modeling assumptions under the most severe drought conditions ever recorded (1940 to 1941 event), Mounds Lake would still be capable of delivering 60 million gallons of water a day. Under this scenario most other surface water resources would be exhausted. The impact to ground water resources during such a drought is not well understood at this time.

As we complete the feasibility stage of the project, many questions remain. The complexity of this project requires much review, input and contemplation. Building a lake is a disruptive process. Purchasing personal property for public use should be a difficult decision. Permanently changing the landscape demands careful evaluation and community involvement. Since the inception of the idea for Mounds Lake these core principals have guided the decisions of the project team and will continue to do so throughout the process.

For a few, there is no amount of study that will convince them that this project should move forward. However, for a great many others, creating the Mounds Lake Commission and advancing

the project into the permitting phase is the logical next step. We expect the communities to consider the formation of the Mounds Lake Commission in the near future.

This report follows a Phase I Feasibility Study completed in fall of 2011, which first explored the possibility of creating Mounds Lake. Our effort in Phase II has been to look more closely into engineering and environmental issues identified in Phase I. In addition, finances, project leadership, plus community outreach and planning have been taken into consideration.

Engineering Feasibility - DLZ Engineering Report

A major component of the Phase II Feasibility Study focused on engineering feasibility. The goal of the engineering feasibility study was to further investigate issues and potential challenges related to Mounds Lake's design and construction. In this study, DLZ Engineering examined a wide range of engineering related issues and potential concerns. Upon completing their analysis, DLZ concluded that it is feasible to build the Mounds Lake project from an engineering perspective. There are still many questions related to permitting and project design that will have to be answered as the project proceeds, but no unforeseen challenges were identified by the Phase II engineering feasibility study.

Here is a brief summary of the issues related to Mounds Lake's design and construction that were evaluated as part of DLZ's study:

1. **Yield Analysis:** The intent of this section is to understand how much water Mounds Lake could produce under several drought scenarios. To accomplish this, various historic droughts were modeled and the impacts to the proposed reservoir were observed. Future analysis will focus on demonstrating the value of the reservoir to protect against drought vulnerability for the central Indiana region. 60 million gallons a day (MGD) is the yield.

2. **Social, Environmental, and Regulatory Investigation, Coordination**: The goal of this section included reviews of a wide range of features related to potential changes to land conditions and uses, water quality, habitat and social issues. A feasibility study level review of existing conditions and potential changes once the reservoir is constructed are examined in this section. Based upon this review, there are a number of impacts to the social, economic and environmental resources within the project area. Preliminary mitigation requirements for each impacted resource have been identified and initial discussions with regulatory agencies have been conducted. Anticipated future NEPA requirements have been identified. Upon a review of the findings of this report with the state and federal agencies, next steps will include discussing mitigation requirements as well as the preparation of the Environmental Impact Statement (EIS).

Mounds Park: The protection and preservation of the pre-historic mound constructions at Mounds Park is of the utmost importance. A review of the area elevations indicates that all park buildings, campsites and the pre-historic Mounds are located well above the highest projected flood stage of Mounds Lake. Mounds Park has historically flooded in the lower lands on the average of three events per year. These fast current flood events have played a major role in creating the current river valley. It can be expected that once Mounds Lake is established,

erosion of the side walls of the valley would greatly diminish. Additional studies of the soil type in this area will need to be performed to determine if any erosion protection is needed for this area.

3. **Geotechnical (Borings at Proposed Dam Site/Reservoir Pool Site):** As a continuation of the Phase I study, a better understanding of the subsurface conditions that will influence the proposed dam design, construction, and operation required additional geotechnical work. At this stage of the investigation, there appear to be no major geotechnical issues that should prevent this project from continuing on to the next stage. Additional field analysis and geotechnical borings will be performed to further evaluate geotechnical conditions at the proposed dam location and within the proposed reservoir footprint.

4. **I-69 over White River Bridge Raising/ Replacement Feasibility:** Increasing the pool level of the proposed reservoir has a substantial impact on its overall water availability. An increase of approximately 5 feet adds over 3 billion gallons of available water. However, this increase would require the current I-69 bridges over the White River to be replaced at a higher elevation to protect the bridges and allow the pool level to be increased without impacting the bridges or their substructure and superstructure. A preliminary evaluation for raising the grade of I-69 over the White River in the headwater area was performed to provide for at least 1-foot of freeboard over the 100-year flood elevation in the headwater pool of the dam.

5. **Evaluate the effect of the Mounds Lake Reservoir on the Chesterfield and Yorktown Wastewater Treatment Plants:** In this section the effect of the new pool heights on the Chesterfield and Yorktown wastewater treatment plants (WWTP) was evaluated. This included the effect on the NPDES permits of each WWTP based on a review of the relevant Indiana regulations and meetings with IDEM, as well as the impacts of new flood elevations on the WWTP operations. Based on this evaluation discussions with local officials regarding various options will take place as the project advances to Phase III.

6. **Dam Flood Routing:** The hydraulic routing of the Probable Maximum Flood (PMF) event through the reservoir and dam for two pool levels was evaluated and the spillway/dam configurations required for these pool levels was estimated in this section.

7. **Opinions of Probable Cost:** A feasibility level cost analysis for the Mounds Lake project has been performed as part of this study. The cost analysis includes all items that are likely to be part of the final project. The total probable cost of construction for the Mounds Lake reservoir is $440,000,000 in 2014 dollars.

The cost to construct a new water treatment plant to treat water from Mounds Lake was also examined as part of this feasibility study. By developing a water treatment plant, the community would have the ability to sell treated water to a wide range of utilities in the Central Indiana region. Analysis indicates that Mounds Lake has the capacity to produce 40 MGD of water for sale, while maintaining several billion gallons of water in storage to be used in the event of a long term drought. The probable cost to permit, design and construct the conveyance pipe, intake and water treatment plant is estimated to be $120,000,000. A discussion regarding the overall financial feasibility of selling processed water is discussed in the Phase II Financial Feasibility Report.

The next steps are to review each probable cost area in more detail to refine the projected total costs for Mounds Lake and constructing an intake, conveyance pipe and water treatment plant for the purpose of selling treated water.

8. **Conclusions and Recommendations:** The engineering portion of the Mounds Lake Phase II Feasibility Study is inherently broad in scope and while many questions have been answered it is clear that several issues will require additional analysis as the project advances to the permitting stage of the process. The intent is that the impacted communities and the Mounds Lake Commission will have significant input into several of the engineering and planning related issues addressed in the engineering feasibility report.

Subsurface Environmental Analysis - SESCO Environmental Report

As part of Phase Two of the Mounds Lake Project, an effort was made to identify sites that could present a subsurface environmental concern to the Project and to provide remediation cost estimates for those sites. A range of methods were used to identify sites including historic records reviews, interviews with local citizens and visual surveys. To develop remediation cost estimates a risk based approach was employed, which used accepted environmental engineering best management practices, and considered a range of contaminant level scenarios.

A number of sites, totaling 120 acres of the proposed 2,100 acre Project footprint, were identified that potentially pose environmental concerns. Historic environmental concerns that have not been fully addressed were discovered at a number of the sites. For sites where data gaps exist, additional investigations will be necessary to understand subsurface conditions. The additional investigations will be performed in a subsequent phase of the Project in order to properly plan for any necessary remediation activities. Sampling data from a former GM ground water monitoring well network, near the project area, indicates the presence of low levels of contaminants at some locations. A review of historic data from the wells indicates an overall downward trend in observed contaminant levels since 1996, to the point of non-detection at many locations. Additionally, a remediation project at a former General Motors (GM) property that is located up gradient of Mounds Lake is scheduled to begin in early 2015.

Based on the limited subsurface data available at this time and assuming the presence of significant quantities of contaminated materials, the most probable cost estimate to remediate the identified sites is $35 million dollars. The cost could be higher or lower depending on what is actually discovered during the investigations at the sites.

There will be stringent oversight by, and close coordination with, state and federal regulatory agencies. There have been a number of discussions with IDEM and USEPA regarding environmental aspects of the Project. If properly investigated and remediated, subsurface environmental impacts related to current and past land uses of the Mounds Lake site will not pose a risk to Mounds Lake as a regional drinking water supply. Based on available information, none of the identified sites present an environmental risk or remediation cost so great as to prohibit the Project from advancing to the next phase of development.

Financial Feasibility –Krohn Financial Report

The purpose of this report is to explore the potential viability of enterprise operations that could support the construction and operations of Mounds Lake and a wholesale water production facility and transmission mains. Due to the potential for a sustained 2 year drought, along with an overall water supply shortage in Central Indiana, the Mounds Lake Commission would be established to construct, own and operate a surface water treatment / production facility. Mounds Lake could enhance a number of public health and welfare issues, as well as to create recreation opportunities and an economic development engine for Madison and Delaware Counties. If wholesale water sales could reach 40 MGD at a rate of approximately $2.85 per 1,000 gallons (about what Patoka Lake Regional Water District sells water for in their most recent construction phases), and production costs can average approximately $.60 per 1,000 gallons (a reasonable estimate for such large production volumes), it appears that there should be sufficient net revenues to support a 30 year revenue bond, payable semi-annually with a 3% annual cost of capital.

The financing assumptions assume that grants and zero interest loans would be available for some front-end costs. If the Commission had to fund interest during construction and include conventional issuance costs in the financing assumptions, the project costs could increase by $30M and $15M, respectively ($45M in total if both capitalized interest and issuance costs were to be funded). The ultimate level of federal and/or state funding could have a dramatic impact on the ultimate debt service requirements and end user fees necessary to service the debt. Admittedly, there are many variables in this working model. As the project develops, assumptions and funding opportunities can be refined.

Imagine Mounds Lake - CED Report

Central Indiana Water Needs

Over the last decade, several water studies have been conducted by municipalities, utilities and interested stakeholder organizations, including the following:

- *2004 Malcolm Pirnie Report*, City of Indianapolis
- *2010 Central Indiana's Regional Water Supply*, Greater Indianapolis Chamber of Commerce
- *2010 Black and Veatch Report*, City of Indianapolis Service Advisory Board
- *2014 Water and Economic Development in Indiana*, Indiana Chamber of Commerce

They all point within the central Indiana region at current and future water needs. Understanding conservation must play a role in any future water capacity for the region. New ability to transport water through the region must also be a part of an overall solution.

Public and Governmental outreach

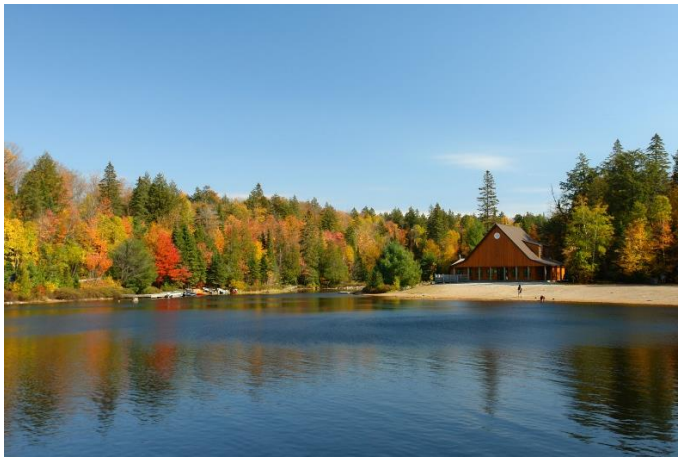
A website (www.moundslake.com) was developed early in the Mounds Lake project process and has been an important tool to provide a central location for access to information. A Facebook page has also been helpful at community outreach as the project has developed during Phase II.

Mounds Lake project team members have conducted informational presentations to high school students, college students, trade organizations, service groups and at various statewide conferences. Project team members have presented dozens of these presentations since the project's beginning. In addition, project team members have presented to and been available to answer questions at approximately 16 public meetings, such as city council meetings, town council meetings and various county government meetings. The project team members have also communicated with state and federal elected officials and/or their staffers in providing basic information on the project.

Imagine Mounds Lake Community Sessions

In August 2014 the ACED conducted a series of interactive visioning sessions, designed to give area residents an opportunity to provide feedback about the Mounds Lake project and learn more about the Phase II Feasibility Study findings. Sessions were held during the week of August 19 through August 23 in Chesterfield, Daleville, Yorktown and Anderson. The main exhibit was located in Anderson's Mounds Mall, which is located within the proposed Mounds Lake footprint.

The goal of the sessions was to involve the community in the project and spark the imagination of local residents. There was an attempt to provide a more immersive experience by presenting information visually, through videos and by having large numbers of well-trained project team members and volunteers available to answer questions from attendees. These sessions provided a picture of what Mounds Lake could look like and mean for communities in Madison and Delaware Counties. A mailed invitation letter for this event was sent to all of the impacted property owners in addition to an update on the project.



Nearly 4000 people attended the Imagine Mounds Lake visioning sessions.

Mounds Lake Commission

If the Mounds Lake project moves forward, a commission will need to be formed from the communities in the footprint of the lake. From this, the commissioners from the local units would hire an executive team to lead the local effort of preliminary design and permitting which we refer to as Phase III work.

Future Considerations

As the Mounds Lake project advances into Phase III, there will be additional discussions with engineers, planners and local officials from impacted communities and stakeholder groups. In Phase III, the Mounds Lake project will consider what features/considerations can be integrated into the overall reservoir engineering design to assist in achieving the goals of area communities. Impacted communities and other stakeholders will provide input on a range of topics related to future land use, transportation and organizational structure. Some of the issues that will be considered as we move forward are discussed in this section.

Future Land Uses and Transportation: Communities located adjacent to the Mounds Lake project will need to decide how the lake will be integrated into their communities. Issues will be debated and decided within the context of the Mounds Lake Commission. Land use issues such as the number and location of public access points, and what types of buildings will be permitted will be thoroughly explored. A detailed evaluation of transportation infrastructure for the Mounds Lake project area will be conducted during Phase III of the project. This information will be used in the decision making process to decide future road and bridge locations.

Water Delivery Options and Drought Vulnerability: Mounds Lake is being proposed as a water supply reservoir. For this reason, various delivery/distribution options and a more detailed study of how susceptible Central Indiana's water supply is to drought vulnerability will be conducted in Phase III. As has been discussed, there are several studies that demonstrate a water need for Central Indiana communities. There are a number of possible methods to deliver water from Mounds Lake to other communities in need of additional water resources. These methods include; releasing water directly to the White River, releasing water to nearby streams to balance levels in area reservoirs for water supply, and constructing a new water treatment plant and pumping water into utility distribution networks to balance overall system supplies throughout the entire utility service area. Additional studies, modeling, and analysis needs to be conducted to more fully understand the complex and interrelated nature of Central Indiana's water resources.

Water Quality Enhancements: As Mounds Lake is being proposed as a water supply reservoir, protecting and enhancing upstream water quality is of utmost importance. The Mounds Lake project presents an unparalleled opportunity to substantially improve the water quality of the entire Upper White River Watershed. A range of water quality enhancements will be discussed and evaluated as the project advances to Phase III. At this time a low head dam near the headwaters of Mounds Lake is being proposed that will achieve multiple project goals. The pool created upstream of the dam, will slow down the stream flow causing sediment to settle out prior to entering the main pool of the reservoir. This will protect the water quality within Mounds Lake and create a convenient location to dredge sediment in the future. Upstream water quality enhancements that will be considered include acquisition of property to create buffer strips and the creation of new wetland areas. Discussions will be held with representatives from upstream communities and watershed organizations to explore various ideas and options to enhance water quality throughout the Upper White River Watershed.

In addition, a variety of best management practices to keep sediment and nutrients out of the reservoir will be thoroughly evaluated. Options to be explored include: building set back requirements, requirements for native grass plantings adjacent to the lakeshore, livestock grazing setbacks, and use of environmentally friendly lawn fertilizers.

Environmental Mitigation and Natural Recreation Areas: As part of the Mounds Lake project a substantial amount of environmental mitigation will be required. Mitigation is a requirement where wetland areas impacted during development of a project be preserved or recreated at another location. The goal of the Mounds Lake project is for all protected or created property to be located within the communities impacted by the project or at an upstream location as a method to improve water quality. Mitigation strategies will be discussed with the impacted communities and other stakeholder organizations. Some of the ideas being considered to meet mitigation requirements include the creation of multiple natural areas and new recreation areas throughout the Upper White River Watershed Area. Potential ideas include: development of an extensive trail network, newly created wetland areas, development of the former Killbuck Park / Bex Farm area as a natural recreation area, expansion of Mounds State Park, and acquisition of property to create agricultural buffer strips adjacent to the White River upstream of Mounds Lake.

Renewable Energy Options and Sustainable Demolition Practices: In Phase III of the Mounds Lake project a number of renewable energy options will be evaluated. The potential to generate electricity utilizing hydropower at the Mounds Lake dam will be studied. Additionally, photovoltaic solar electric power generation will be explored, as will small scale wind generation. Innovative reuse, recycling and waste disposal options for demolition debris and woody debris (brush) will also be explored. Demolition of structures could occur in phases where reusable materials are removed first, recyclables next and waste products last. Woody debris could be used for mulch and other landscaping products. Finally, waste disposal options such as pyrolysis for electricity generation and substantial reduction in waste quantities will be evaluated for demolition debris.

Effects on Drainage and Downstream Impacts: How the Mounds Lake project impacts drainage for agricultural users as well as homeowners will be more thoroughly evaluated in Phase III of the project. This may include the development of calibrated water quantity models to examine how drainage tiles and other infrastructure will be effected by the development of Mounds Lake. Additional targeted geotechnical studies to better understand how Mounds Lake will effect drainage in neighborhoods adjacent to the lake may be necessary. With respect to downstream impacts, Mounds Lake is being developed as a water supply reservoir, but there are likely to be some downstream flood control benefits. Also, water released from Mounds Lake will ensure minimum river flow rates during dry periods.

Unique Recreation Opportunities: One goal of the Mounds Lake project is to integrate unique recreation opportunities throughout the impacted communities. As the project advances to Phase III, recreation features located throughout the country will be researched. Working with the impacted communities and other stakeholders a number of recreation options will be developed and integrated into the project. A few possible ideas include the following. A convenient canoe/small boat portage point or other innovative passages around the dam could be developed. A constructed riffle zone and possibly a kayak course could be constructed downstream of the Mounds Lake dam. A dedicated beach area could also be developed for Mounds Lake. Expansion of Mounds Park and the construction of a unique pedestrian suspension bridge within the park may be considered.

These issues and many others will be thoroughly considered as the Mounds Lake project advances to Phase III of the development process. The Mounds Lake project is committed to identifying and integrating the best ideas into the project.

Conclusions to Summary

Mounds Lake is feasible from an engineering design standpoint. Though a challenging project, this river corridor offers a unique opportunity to create a lake. Mounds Lake can pay for itself over time through the sale of water. By capturing just 66% of its drought yields for drinking water, the revenues would be sufficient to repay construction debt. To build Mounds Lake would not only increase the current regional water infrastructure, to meet both current and future regional needs, but will also provide the infrastructure required for drought preparedness.

Developing Mounds Lake will be a challenging process. Though all impacts can be mitigated under federal guidelines, careful community planning will need to be considered at each step to assure the best possible outcome for all stakeholders. We should press to use the mitigation dollars on as many local projects as possible, enhancing and expanding the cultural heritage of Mounds Park. Considering the local impacts, the project must work in conjunction with regional, state, and federal stakeholders, both private and public.

Change is inevitable and can create resistance. What we have today came from boldness to overcome uncertainty and fear, to build for future generations. Only in time will the history of Mounds Lake be written. However, the dedication of leaders to guide and protect the process can create a destination as well as provide a valuable commodity for the entire region. The future is ours to define!

Mounds Lake – *Navigate The Future*.