**Limestone Bluffs Resource Conservation and Development Area, Inc.**

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**To:** Jerry Neppel, Environmental Specialist Senior, IDALS-DSC, Des Moines

Mark Schneider, ECIA, Dubuque

EIRUSS, Dubuque

Frank Frieburg, Jackson County Sanitarian, Maquoketa

Leisure Lake Association **From:** Jon E. Bell, Council President **Date:** July 11, 2014

**Subject: 9014-010 Lytle Creek Watershed Improvement Project**

WIRB Progress Report

For the period: January 1, 2014-June 30, 2014

The following provide a brief summary of the Limestone Bluffs RC&D- Watershed Improvement Review Board Grant Agreement #9014-010 accomplishments. The Eastern Iowa Regional Utility Service Systems (EIRUSS) constructed the Leisure Lake Wastewater System, providing environmental benefits to the Lytle Creek Watershed.

The existing Leisure Lake community was served by private wastewater systems; there was no public system serving any of the community. Wastewater from many properties ultimately discharged to the lake and ultimately to Lytle Creek. Community and public records research determine the following conditions existed prior to construction (#1-3). The construction accomplishments and benefits to be derived from the construction of a public wastewater system serving the community are listed below:

1. The Leisure Lake area includes 310 homes/structures that generate wastewater. At the time of construction, only 25% or 78 had legally permitted on-site systems according to Jackson County records. One-third of those permitted on-site systems (26) had holding tanks that filled and required pumping when full. The facilities for wastewater disposal for the other 232 wastewater generators were and remain "officially" unknown. During construction septic tanks containing effluent were pumped and the tanks were collapsed and filled. It was noted that there are some "septic tanks" that contained little or no effluent and many showed signs of inadequate design, construction and capacities. There were instances noted where no septic system existed and numerous where "gray" water was discharged on the ground. In other instances, it appeared that some of the wastewater has been piped to discharge directly to drainage ways.

2. The Leisure Lake area has 232 homes/structures that generate wastewater without proper/permitted treatment. It is assumed that a significant amount of untreated or inadequately treated wastewater was entering and polluting the environment. The wastewater from the 232 of wastewater generators would amount to over 31,000 gallons per day. The biochemical oxygen demand in that flow would be nearly 53 pounds per day. Suspended solids would be over 62 pounds per day. The estimated nitrogen (organic and ammonia) would be over 11 pounds per day. This flow and the

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pollutants is equivalent to a community of 310 people discharging raw sewage to the surface or groundwater.

3. The individual wastewater systems consisting of only a septic tank is an incomplete treatment process. A septic tank alone will only remove 25 to 50% of the biochemical oxygen demand, 60 to

70% of the suspended solids, 70 to 80% of the oil and grease, no more than 15% of the phosphorus, nearly zero nitrogen and 0 to 10% of the bacteria and viruses.

Accomplishments and Benefits:

4. There were 310 grinder pump stations installed at the individual properties that accept effluent, pump it to a lift station via almost 70,000 feet of pipe.

5. The lift station pumps the wastewater at a rate of 150 gallons per minute over 530 feet to the lagoon for treatment.

6. The Leisure Lake Wastewater System constructed a 3-cell lagoon with the capacity to properly

treat the wastewater generated from the Leisure Lake community. The wastewater treatment lagoon required over 46,000 cubic yards of earth moving. The lagoon was lined with nearly

300,000 square feet of plastic liner to prevent seepage into the shallow fractured limestone. The lagoon contain almost 1,100 feet of piping to distribute and convey the wastewater within the lagoon site. Wastewater entering the lagoon and discharges from the lagoon is routinely measured and recorded. The system is permitted by the Iowa DNR and is routinely monitored and tested with discharges made twice per year upon acceptable effluent sampling results confirmed by a licensed laboratory.

7. The project will protect/improve surface water quality of Leisure Lake and Lytle Creek by the

elimination of the discharge of untreated or partially treated wastewater.

8. The project will protect/improve ground water quality by elimination of the seepage of untreated or partially treated wastewater through shallow fractured limestone.

9. The water quality in Leisure Lake will improve as a result of the elimination of seepage and runoff of untreated or partially treated wastewater to the lake.

10. The project will protect the water supply of many of the residents who utilize the shallow fractured

limestone for wells.

11. Leisure Lake has a contributory drainage area of perhaps 5 square miles limiting the source of surface water. The source of the water is seepage from the shallow fractured limestone (springs). The limited amount of water flowing into Leisure Lake and Lytle Creek results in the concentration of pollutants such as oxygen demand, nitrogen, phosphorus, bacteria and viruses.

12. The controlled discharge lagoon is a controlled discharge of properly treated wastewater and will

benefit animal life.

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| **WIRB Line Item** | **Description** |  **WIRB Contract Amount**  |  **WIRB Expense**  |
|  | **Administrative Expenses** |  |  |
| 1 | Equipment- Flow measuring up to 20% of Cost |  $ 1,066.00  |  $ 1,294.65  |
| 2 | Engineering |  $ 4,511.00  |  $ 4,511.00  |
| 3 | Project Administration |  $ 32,610.76  |  $ 32,610.76  |
| 4 | Project Audit |  $ 2,000.00  |  $ 3,000.00  |
|  |  |  |  |
|  | ***Administrative Subtotals*** |  **$ 40,187.76**  |  **$ 41,416.41**  |
|  |  |  |  |
|  | **Construction Expenses** |  |  |
| 5 | Lagoon- up to 17% share |  $ 19,616.00  |  $ 29,882.21  |
| 6 | Pipes- lagoon site- up to 17% share |  $ 14,392.00  |  $ 26,414.01  |
| 7 | Manholes- up to 15% share |  $ 2,452.00  |  $ 6,810.90  |
| 8 | Sealant/Riprap/Stone- up to 17% share |  $ 20,256.00  |  $ 25,824.05  |
| 9 | Fence/gates/signs- up to 16% share |  $ 6,450.00  |  $ 7,599.86  |
| 10 | LPS collection- up to 16% share |  $ 288,399.00  |  $ 265,426.42  |
|  |  |  |  |
|  | ***Construction Subtotal*** |  **$ 351,565.00**  |  **$ 361,957.45**  |

Table 2. Total Project Funding

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| **Funding Source** | **Approved Application Budget** | **Actual Expenditures** |
| WIRB | $391,752.76 | $391,752.76 |
| EIRUSS | $2,600,103.00 | $3,509,488.30 |
| **Totals** | **$2,991,855.76** | **$3,901,241.06** |

Watershed Improvement Fund Contribution: Approved Application Budget: 13%

 Actual: 10%