

**UPDATED OHIO EPA ALTERNATIVES ANALYSIS FOR THE LEGENDARY RIDGE  
RESIDENTIAL DEVELOPMENT PROJECT, HAMILTON COUNTY, OHIO  
SEPTEMBER 15, 2014**

**1 REGULATORY BACKGROUND INFORMATION**

**REGULATORY REQUIREMENTS**

This Alternatives Analysis is part of the Ohio Environmental Protection Agency's (Ohio EPA) 401 Water Quality Certification application that Legendary Ridge Developers, LLC, of Cincinnati, Ohio, has completed for the residential housing development project that Legendary Ridge Developers, LLC plans to undertake on the Legendary Ridge property, located at 8202 Bridgetown Road, in Miami Township, Hamilton County, Ohio.

**PERMITTING REQUIREMENTS**

This project will require a Clean Water Act Section 401 Water Quality Certification from the Ohio EPA.

Legendary Ridge Developers, LLC is also applying for a federal Clean Water Act Section 404 permit from the Huntington, West Virginia, district office of the U. S. Army Corps of Engineers (COE) for this project.

**ANTIDegradation RULE**

In order for the Ohio EPA to issue a Section 401 certification, Legendary Ridge Developers, LLC understands that this project must comply with Ohio's Water Quality Standards (OAC 3745-1) and not potentially result in an adverse long-term or short-term impact on water quality. Included in the Water Quality Standards is the Antidegradation Rule (OAC Rule 3745-1-05), effective October 1, 1996, revised October 1997 and May 1998. This Rule includes additional application requirements and public participation procedures. The additional application requirements are presented in Part 10 of the Ohio EPA Section 401 application.

**INFORMATION REQUEST FROM PART 10 of SECTION 401 APPLICATION**

Legendary Ridge Developers, LLC herein provides the information requested in Part 10 of the Ohio EPA Section 401 application. Legendary Ridge Developers, LLC understands that this information will be used to evaluate the project for certification and is a matter of public record. If the Director of the Ohio EPA determines that the application lacks information necessary to determine whether the applicant has demonstrated the criteria set forth in OAC Rule 3745-32-05(A) and OAC Chapter 3745-1, Legendary Ridge Developers, LLC further understands that the Ohio EPA will inform Legendary Ridge Developers, LLC in writing, of the additional information that must be submitted. Legendary Ridge Developers, LLC also understands that its application will not be accepted until the application is considered complete by the Section 401 Coordinator.

## 2 SUMMARY OF ALTERNATIVES FOR THE LEGENDARY RIDGE PROPERTY

### ALTERNATIVES FOR PROJECT

The Antidegradation Rule requires a Section 401 Certification application to include a report that evaluates three alternative designs for the proposed project, including:

- Alternative A: The preferred design for the Legendary Ridge property and the proposed mitigative techniques;
- Alternative B: A minimal degradation alternative (scaled-down version of the project) for the Legendary Ridge property and proposed mitigative techniques; and
- Alternative C: A non-degradation alternative for the Legendary Ridge property (project resulting in avoidance of all waters of the state)

### ALTERNATIVE A: "PREFERRED" DESIGN WITH MAXIMUM IMPACT

**Proposed Design:** The preferred design for the Legendary Ridge property includes the following:

Develop 97 single residential structures; with supporting features, including streets, utilities, and a stormwater system on the 56 acres.

A combined total of 3,390 linear ft of eight different ephemeral streams, and 250 linear ft of two intermittent streams, for a total of 3,640 linear ft (0.22 acre) would be impacted for this design alternative. A total of 92% of the intermittent streams and 39% of the ephemeral streams will not be impacted with this alternative.

**Proposed Mitigation:** Legendary Ridge Developers, LLC proposes the following on-site stream mitigation to compensate for the loss of the ephemeral and intermittent streams.

- Legendary Ridge Developers, LLC proposes to mitigate for the loss of a portion of the ephemeral streams by constructing 2,600 linear ft of grassy swales and riprap-lined ditches that will serve as the development's post-construction stormwater management system.
- Legendary Ridge Developers, LLC proposes to mitigate for the remaining 790 linear ft of ephemeral stream impacts and 250 linear ft of intermittent stream impacts by preserving the total length of the high quality intermittent (Stream A), intermittent Streams A-5, A-8, and A-9, and ephemeral streams (Streams A-1, A-2, A-3, A-8 and A-9) located on the Legendary Ridge Property, for a total of about 2,170 linear ft of ephemeral streams and 1,975 linear ft of intermittent stream preservation, for a combined total of 4,145 linear ft of stream preservation (a 4.4:1 preservation ratio).

This proposed mitigation is presented in detail in the mitigation plan that is also being provided to the U.S. Army Corps of Engineers and the Ohio Environmental Protection Agency as part of the Section 404 and Section 401 permit application packages being submitted to these agencies.

**Feasibility:** This alternative is practical and possible for this property. Legendary Ridge Developers, LLC has been able to design a roadway system and a residential lot layout that allows for most of the on-site streams to be left undisturbed without significantly impacting the financial feasibility of the project.

**ALTERNATIVE B: DESIGN WITH MINIMAL IMPACT**

**Proposed Design:** The minimal impact design for the Legendary Ridge property includes the following (Figure 8):

Develop 72 single residential structures; with supporting features, including streets, utilities, and a stormwater system on the 56 acres.

A combined total of 2,850 linear ft of eight different ephemeral streams would be impacted for this design alternative. A total of 100% of the intermittent streams and 49% of the ephemeral streams will not be impacted with this alternative.

**Proposed Mitigation:** Legendary Ridge Developers, LLC proposes the following on-site stream mitigation to compensate for the loss of the ephemeral and intermittent streams.

- Legendary Ridge Developers, LLC proposes to mitigate for the loss of a portion of the ephemeral streams by constructing 2,850 linear ft of grassy swales and riprap-lined ditches that will serve as the development’s post-construction stormwater management system.

**Feasibility:** This alternative is physically possible for this property but economically possible for this property.

**ALTERNATIVE C: DESIGN WITH NO IMPACT**

**Proposed Design:** A no impact design for the Legendary Ridge property is not practical or possible.

The no-impact design presented herein is not practical or possible. A total of only 53 houses could be built for this alternative.

**Proposed Mitigation:** No mitigation would be required because this is a no impact design.

**Feasibility:** This alternative is not practical or economically possible for this property.

**SUMMARY OF PRACTICALITY OF ALTERNATIVES**

Legendary Ridge Developers, LLC is not interested in pursuing the development of this property according to Alternatives B or C. Neither one of these alternatives is economically feasible.

**3 INFORMATION RELATIVE TO THE ANTIDegradation RULE**

**Part 10a**

**Provide a detailed description of any construction work, fill or other structures to occur or to be placed in or near the surface water. Identify all substances to be discharged, including the cubic yardage of dredged or fill material to be discharged to the surface water.**

**Response to 10a** Approximately 3,195 linear ft of intermittent streams and 5,560 linear ft of ephemeral streams are located on the Legendary Ridge property. The preferred impact Legendary Ridge design plan (Alternative A) calls for impacts to the following on-site streams:

<b>STREAMS ON THE LEGENDARY RIDGE PROPERTY AND PROPOSED IMPACTS TO THESE STREAMS</b>				
<b>STREAM</b>	<b>CURRENT EPHEMERAL LENGTH (feet)</b>	<b>CURRENT INTERMITTENT LENGTH (feet)</b>	<b>PROPOSED LENGTH OF IMPACT (feet)</b>	<b>PROPOSED AREA OF IMPACT (square feet)</b>
A	0	1700	150	1,500
A-1	140	0	0	0
A-2	75	0	0	0
A-3	350	0	0	0
A-4	870	0	365	630
A-5	800	150	760	2490
A-5-A	800	0	700	1110
A-6	140	0	65	0
A-7	470	100	100 (int) 485 (eph)	1710
A-7-A	250	0	250	530
A-8	515	35	250	397
A-9	1150	140	515	2175
B	0	1070	0	560
<b>TOTALS</b>	5,560	3195	3,640 (3,390 ephemeral) (250 intermittent)	9368 (0.22 acre)

The natural materials used to fill these stream sections will consist of clean soils and bedrock derived from the initial on-site grading process.

<b>AMOUNT OF FILL MATERIAL TO BE PLACED IN THE STREAMS FOR ALTERNATIVE A (PREFERRED DESIGN) FOR LEGENDARY RIDGE</b>					
<b>STREAM</b>	<b>IMPACT AREA (square feet)</b>	<b>AVG. HEIGHT OF OHWM (feet)</b>	<b>AVG. DEPTH OF FILL (feet)</b>	<b>FILL WITHIN OHWM (cubic yds)</b>	<b>FILL ABOVE OHWM (cubic yds)</b>
A	1,500	2	10	111	444
A-4	548	1	4	20	61
A-5	2280	1	15	84	1182
A-5-A	1050	1	15	39	544
A-6	65	1	2	3	3
A-7	1755	1	15	65	910
A-7-A	250	1	10	9	83
A-8	375	1	5	14	55
A-9	1545	1	15	57	801
<b>TOTAL</b>	9368			402	4083

**Part 10b**

**Describe the magnitude of the proposed lowering of water quality. Include the anticipated impact of the proposed lowering of water quality on aquatic life and wildlife, including threatened and endangered species (include written comments from Ohio Department of Natural Resources and U.S. Fish and Wildlife Service), important commercial or recreational sport fish species, other individual species, and the overall aquatic community structure and function. Include a Corps of Engineers approved wetland delineation.**

**Response to 10b** Overall long-term water quality will not be lowered significantly as a result of the development of the Legendary Ridge property. It is acknowledged that, during the construction phase of the development project, a minimal amount of sediment potentially could escape into the stream system; as is typical of most large-scale development projects.

A large regional stormwater detention basin had been previously constructed in 2004 on the downgradient off-site section of intermittent Stream A (the primary stream on the Legendary Ridge property). This basin was constructed when the original Legendary Ridge residential development project was started in 2004 (not part of this current project but part of the original design). All water discharging from the new Legendary Ridge project will flow into this basin before being discharged into Jordan Creek.

No rare or endangered plant or animal species were found on the Legendary Ridge property while conducting multiple field visits to the site. The relatively young forested areas on the portion of the property where the majority of the development will take place provide little potential habitat for endangered plant or animal species known to occur in southwestern Ohio.

Several shagbark hickory trees (Indiana bat habitat) are located on the property, but in the area that will not be cleared for the Alternative A design.

Commercial or recreational sport fish are not present on the Legendary Ridge property.

No wetlands are present on the Legendary Ridge property. A thorough delineation of the on-site streams was conducted as part of this permitting process.

**Part 10c**

**Include a discussion of the technical feasibility, cost effectiveness, and availability. In addition, the reliability of each alternative shall be addressed (including potential recurring operational and maintenance difficulties that could lead to increased surface water degradation).**

**Response to 10c:** Alternatives B and C are not technically and/or financially feasible for the Legendary Ridge property. The development of the Legendary Ridge property cannot be successfully completed with either Alternatives B or C. With both of these alternatives not possible, Legendary Ridge Developers, LLC made the decision to undertake the alternative that will result in the successful completion of the project with the minimal amount of impact to the on-site streams; i.e., Alternative A (100% avoidance of intermittent streams and 39% avoidance of ephemeral streams).

The following data table presents a hypothetical cost analysis for the three alternatives.

**COST COMPARISON FOR THE THREE ALTERNATIVE DESIGNS FOR LEGENDARY RIDGE RESIDENTIAL DEVELOPMENT PROJECT**

COST COMPARISON FEATURES	ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C
	Preferred Design	Compromise Minimal Impact Design	No-Impact Design
# of Lots	97	72	53
Construction Cost	\$2,200,000	\$2,100,000	\$2,000,000
Ground Value	\$800,000	\$800,000	\$800,000
Soft Cost & Profit	\$2,000,000	\$2,000,000	\$2,000,000
Total	\$5,000,000	\$4,900,000	\$4,800,000
Development Cost Per Lot	\$51,546	\$68,056	\$90,566

The most cost effective lot layout is Alternative A, at \$51,546 per lot development cost. This layout, however, disturbs more greenspace and 25% more streams are impacted than for Alternative B (3,640 vs. 2,850 ft of streams). Alternative C is not feasible at a development cost of \$90,566 per lot. This development plan calls for affordable homes starting at \$200,000. A lot price of \$90,500 would make it impossible to provide affordable housing. The Alternative B design shows a developed lot cost of \$68,056 per lot. A developed lot generally should be about 25% of the house cost. The Legendary Ridge Alternative A \$51,500 cost per lot compares well with a home price of \$200,000.

With the completion of Alternative A, the project will result in a net loss of 100 linear ft of intermittent Stream A-7, 150 linear ft of intermittent Stream A, and a combined net loss of 3,390 linear ft of eight different ephemeral streams. A total of 2,600 linear ft of ephemeral drainageways will be constructed as part of the post-construction stormwater management system.

Alternative A, the preferred design for the Legendary Ridge property, should result in no potential recurring operational or maintenance difficulties that could lead to increased surface water degradation.

Intermittent Stream A (the primary stream on the property) originates upgradient and off the Legendary Ridge property and flows through the property. This stream will continue to flow through the Legendary Ridge property. The on-site ephemeral drainageways, with much smaller watershed areas, will continue to discharge to Stream A, such that water from these watersheds will continue to flow along the stream system and water from the property will continue to enter Stream A.

**Part 10d**

**For regional sewage collection and treatment facilities, include a discussion of the technical feasibility, cost effectiveness and availability, and long-range plans outlined in state or local water quality management planning documents and applicable facility planning documents.**

**Response to 10d:** The Legendary Ridge property will not be used for a regional sewage collection and treatment facility. Sanitary wastes generated in the residential structures on the Legendary Ridge property will discharge to an already-existing local sanitary sewer system.

**Part 10e**

**To the extent that information is available, list and describe any government and/or privately sponsored conservation projects that exist or may have been formed to specifically target improvement of water quality or enhancement of recreational opportunities on the affected water resource.**

**Response to 10e:** Legendary Ridge Developers, LLC is not aware of any government and/or privately sponsored conservation project that exists or that may be formed to specifically target improvement of water quality or enhancement of recreational opportunities on this specific section of these small unnamed ephemeral and intermittent tributaries of the Great Miami River watershed, of which the Legendary Ridge property is part, that will be affected by the development of this property.

**Part 10f**

**Provide an outline of the costs of water pollution controls associated with the proposed activity. This may include the cost of best management practices to be used during construction and operation of the project.**

**Response to 10f:** The following water pollution controls and best management systems for stormwater management and erosion control practices have been designed into this project.

- Stormwater management and erosion control systems will be put in place during construction, including silt fences, mulch and/or earthen berms, temporary seeding, hay bales, inlet protection, temporary collection basins, diversion ditches, construction entrances, and other such management devices.
- The estimated cost for these materials, for their installation and maintenance, is estimated to be about \$50,000. This cost could be substantially higher or lower than this estimate. The final cost for stormwater management and erosion control ultimately depends on the weather conditions during the construction season. A dry construction season can substantially lower the cost; whereas a wet construction season can substantially increase the cost for this aspect of the site development.
- Stormwater generated on the Legendary Ridge property during the construction phases of the project will be directed to a series of temporary on-site sedimentation basins. The number and locations of these basins will change and will be placed when and where necessary to be effective in erosion control. The cost to construct these detention basins is included in the above-listed cost for the best management practices.
- The cost to construct the post-construction stormwater sewer system, including the surface drainageways and the underground piping system is estimated at \$65,000.

**Part 10g**

**Describe any impacts on human health and the overall quality and value of the water resource.**

**Response to 10g:** Legendary Ridge Developers, LLC foresees minimal adverse impacts on human health and the overall quality and value of the water resource resulting from the development of the Legendary Ridge property.

No activity associated with the development of the Legendary Ridge property should have an adverse impact on human health.

No significant quantities of any materials, chemicals, or other substances of environmental or ecological or health concerns are planned for release into the environment on this property that should adversely affect human health.

The work associated with the removal of the ephemeral and intermittent streams will result in a short-term localized impact to these systems. These ephemeral streams currently function primarily as conduits for stormwater that drains from the ridge top and upper slopes on this property. The removal of these streams and their replacement with a post-construction stormwater management system that includes over 2,600 linear ft of surface drainageways should not create a long-term negative impact.

#### **Part 10h**

**Describe and provide an estimate of the important social and economic benefits to be realized through this project. Include the number and types of jobs created and tax revenues generated and a brief discussion on the condition of the local economy.**

**Response to 10h:** The Legendary Ridge residential development project will provide important social and economic benefits to western Hamilton County. Following is a listing of the numbers and types of jobs that will be created, the tax revenues generated, and other financial considerations.

**Local Economy:** The overall business environment in the metropolitan sectors of southwest Ohio has remained sufficiently active to continue to attract business to this region. The Legendary Ridge residential development project is in a conveniently located area just outside of the metropolitan area of Greater Cincinnati, within two miles of a major highway (U.S 50) that provides easy access to Interstate Highway 275 and close to educational and recreational facilities. Rural residual properties, such as Legendary Ridge, are found throughout the outer fringe of the Greater Cincinnati metropolitan area. These still-remaining undeveloped properties are being purchased and developed as residential communities.

The Legendary Ridge project will consist of a total of 97 single family houses at an average value of \$250,000. The project has support from the Miami Township Trustees, as well as the Hamilton County Regional Planning Commission. The economic development dollars generated will be approximately \$26,500,000. Annual property tax revenue to the community and school district will be approximately \$459,000. It is estimated that the project will bring 420 much needed home building jobs to the area. These additional homes, in this area of western Hamilton County, will help the nearby economically depressed downtown of the Village of Cleves.

#### **Part 10i**

**Describe and provide an estimate of the important social and economic benefits that may be lost as a result of this project. Include the effect on commercial and recreational use of the water resource, including effects of lower water quality on recreation, tourism, aesthetics, or other use and enjoyment by humans.**

**Response to Part 10i:** Legendary Ridge Developers, LLC foresees no loss of important social or economic benefits as a result of this project.

- This property is not used by the local population for social activities. Neighbors from adjacent residential properties do not use the Legendary Ridge property for recreational activities, since this land is private property.
- No direct access is available to the property from nearby public roadways, such that the fields, streams, and woods on the property are not available to the local population. No evidence was found on the property that indicates the local population or other individuals use this property for hiking, cycling, wildlife watching, fishing, hunting, swimming, boating, or any other outdoor activity.

**Part 10j**

**Describe environmental benefits, including water quality, lost and gained as a result of this project. Include the effects on the aquatic life, wildlife, threatened or endangered species.**

**Response to Part 10j:** Legendary Ridge Developers, LLC foresees no significant adverse change in water quality as a result of this project. Legendary Ridge Developers, LLC also foresees no significant adverse effect on aquatic life, wildlife, threatened or endangered species as a result of this project. Deer, other smaller mammals, birds, and other such wildlife will be displaced during the construction phase of the project. As seen essentially everywhere in Southwest Ohio, however, these same animals are also residents of many of the local residential communities.

Legendary Ridge Developers, LLC is working in cooperation with the Hamilton County soil and water conservation district to develop a long-term stormwater management plan, such that the development of the Legendary Ridge property will not have an adverse effect on the various private and public properties in the downgradient portions of the watershed in which the Legendary Ridge property is located. The post-construction stormwater management system on the Legendary Ridge property is designed to reduce the post development flow from the property to a level less than what currently discharges from the site; thereby, helping to reduce the volume of peak flow during storm events.

**Part 10k**

**Describe proposed mitigation techniques (except for the Non-Degradation Alternative):**

**Response to Part 10k:** Legendary Ridge Developers, LLC proposes the following on-site stream mitigation to compensate for the loss of the 3,620 linear ft (0.2 acre) of ephemeral streams and 250 linear ft (0.02 acre) of intermittent stream.

Legendary Ridge Developers, LLC proposes to construct a total combined length of 2,600 linear ft of post-construction stormwater drainage swales as part of the residential development as mitigation for the ephemeral stream impacts.

These stormwater drainage swales will be constructed primarily as grassy swales. Rip rap will be used, when and where needed, to help stabilize any areas along the swales that may be prone to erosion. These swales will range from 140 to 1,120 linear ft in length and collect runoff from residential lots and roadways and discharge to natural ephemeral and intermittent streams on the property.

Legendary Ridge Developers, LLC proposes to mitigate for the remaining 790 linear ft of ephemeral stream impacts and 250 linear ft of intermittent stream impacts by preserving the

total length of the high quality intermittent (Stream A), intermittent Streams A-5, A-8, and A-9, and ephemeral streams (Streams A-1, A-2, A-3, A-8 and A-9) located on the Legendary Ridge Property, for a total length of 1,975 linear ft of intermittent stream and 2,170 linear ft of ephemeral stream preservation.

This proposed mitigation is presented in detail in the mitigation plan that is also being provide to the U.S. Army Corps of Engineers and the Ohio Environmental Protection Agency as part of the Section 404 and Section 401 permit application packages being submitted to these agencies.