

RIVER REFUGIUM PROJECT

Watershed-Scale Nutrient Recovery Infrastructure

APPENDIX C

Initial Recommended Sites

Five scored candidate locations for first-wave deployment

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ABSTRACT

This appendix identifies the first five candidate deployment sites for the River Refugium Project, scored using the Appendix A matrix. These represent the highest-impact, highest-return, lowest-risk initial opportunities identified to date in the United States.

All scores derive from the 0–5 scale multiplied by category weight, and all are reproducible from the criteria in Appendix A. The top-ranked site — Helena-West Helena / Lula in the Arkansas-Mississippi corridor — scores 118 of 150 and is designated the flagship first deployment location.

Scores represent relative deployment readiness assessed from best available public data. They are not absolute performance guarantees, and site-specific survey is required before any capital commitment.

1. Rankings

Site	Score / 150	Tier	Priority
A. Helena-West Helena / Lula, AR-MS corridor	118	Tier 1	#1 — Flagship
B. Cairo, Illinois — Ohio-Mississippi confluence	112	Tier 1	#2 or #3
C. Pine Bluff, Arkansas — Lower Arkansas River	109	Tier 1	#2 or #3
D. Natchez-Vidalia, MS-LA border	106	Tier 1	#4
E. Tulsa-Sand Springs, Oklahoma — Upper Arkansas	97	Tier 2	#5

The first-wave threshold is 110. Sites C, D, and E fall below it and are listed because they are the strongest identified candidates after the top two, not because they clear the bar. Pine Bluff at 109 is within survey error of the threshold and may cross it on site-specific data.

2. Site Assessments

Site A — Helena-West Helena / Lula, Arkansas-Mississippi Corridor

Score 118. Flagship.

This location receives nutrient mass from the Upper Mississippi, Ohio, Missouri, Arkansas, and Yazoo basins — the highest nutrient density corridor in the continental United States. Land is inexpensive, labor is available, the permitting environment is workable, and the growing season is long enough that seasonal shutdown is not a design assumption.

Its strategic value exceeds its composite score. A first node here is visible to the entire Mississippi basin, sits in the geography where the environmental argument is least contestable, and produces a dataset generated

under the highest nutrient loading the framework is likely to encounter. That last point matters more than the first two: data from dense water arrives fast and unambiguous, which is what the pilot exists to produce.

Site B — Cairo, Illinois

Score 112.

Cairo sits at the exact confluence of the Ohio and Mississippi, capturing load from two of the largest river systems in North America through a single intake. This is the purest expression of the follow-the-consolidation principle in the framework. Second-highest composite, and the natural second or third deployment. It is also the point at which acid mine drainage chemistry from the Ohio basin begins to appear in the intake, which makes it a candidate for early sequestration-configuration work.

Site C — Pine Bluff, Arkansas

Score 109.

Lower Arkansas River. Warm climate, low land cost, workable regulatory posture, and adequate nutrient loading. Its principal value is duplication: a working node here establishes that the Helena result was not site-specific, which is the finding that converts a single success into a deployable pattern.

Site D — Natchez-Vidalia, Mississippi-Louisiana Border

Score 106.

Strong nutrient position on the lower main stem with reasonable land and labor conditions. Scores are held down by logistics and by regulatory complexity across a state line. Suited to fourth-wave deployment once the permitting pattern from earlier sites is established and transferable.

Site E — Tulsa-Sand Springs, Oklahoma

Score 97. Tier 2.

Upper Arkansas River. Lower nutrient density than the lower-basin sites and greater seasonal variability, which is why it falls to Tier 2. Its interest is strategic rather than immediate: proximity to Cherokee Nation tributaries makes it the most plausible early test of the tribal corridor pathway described in Appendix B, where sovereign permitting changes the calculus enough to offset a lower composite.

3. Method and Limits

The Appendix A matrix was applied using best available public data on nutrient loads, land values, labor markets, and regulatory environments. No site has been surveyed. No landowner has been approached. No agency has been consulted on any of these locations.

Composite scores are therefore a screening result and nothing more. Their function is to narrow a continental search to a handful of locations worth the cost of actual investigation, and to make the reasoning behind that narrowing auditable by anyone who disagrees with it. A reader who believes the weights are wrong can rescore these five sites from Appendix A in an afternoon and see exactly where the ranking changes.

Notes

Citations follow Chicago Notes-Bibliography style. Internal Cernunnos Foundation and Bright Meadow Group documents are cited by title and year. Figures marked ■ are provisional academic proxies pending replacement by measured pilot values.

1. *USGS, Mississippi River Basin Nutrient Flux Assessment.*
2. *USDA Economic Research Service, Land Value Reports, Arkansas and Mississippi.*
3. *Bright Meadow Group, "RRP0003-apA — Site Selection Matrix," Version 3.0. CF/BMG, August 2026.*
4. *Bright Meadow Group, "RRP0003-apB — National Watershed Priority Map," Version 3.0. CF/BMG, August 2026.*
5. *Bright Meadow Group, "RRP0003 — Consolidated Technical Whitepaper," Version 3.0, §14. CF/BMG, August 2026.*