Use Attainability Analysis

1 Water Body Name	Twelvemile Creek
2 Segment Description	Mouth at Twelve Mile Lake to confluence with unnamed tributary
3 Segment Length (mi)	5.3
4 Drainage Area (sq. mi.)	15.7
5 Segment Start Latitude, Longitude (DD)	41.09176, -94.28818
6 Segment End Latitude, Longitude (DD)	41.12397, -94.32531
7 Route of Flow (Next Downstream Adopted Designated Use)	Twelvemile Creek (A2, BWW2, proposed) to Twelve Mile Creek Lake (A1, BLW, HH, C, existing)
8 NPDES Facility and Permit Number (If Applicable)	Green Valley Chemical Corporation (8800100)
9 Sample Site ID(s)	666-1, 666-1a
10 Segment County Name(s)	Union
11 Field Work Date(s)	9/8/2006 (666-1) & 8/18/2006 (666-1a)

12 Aquatic Life Use Attainability Analysis - Conclusion

Recommended Highest Attainable Use: Aquatic Life Use	BWW2
40 CFR 131.10(g)(2) (Flow)	The natural low flow conditions of the stream segment are insufficient to create the habitat necessary to support a viable community of game fish. A lack of age ranges and diversity of game fish species indicates a non-reproducing population (see Site Observations Table). A BWW1 designation requires multiple species and age ranges to be viable. Therefore, the highest attainable aquatic life use for this stream segment is BWW2.
40 CFR 131.10(g)(5) (Physical Conditions)	Physical conditions related to the natural features of the water body are insufficient to support a viable community of game fish. Drainage area, stream width, average depth (for 666-1), and maximum depth (for 666-1) fall within the "consistently negative" game fish indicator responses (see Table 2 in Appendix I). A lack of age ranges and diversity of game fish species indicates a non-reproducing population (see Site Observations Table). A BWW1 designation requires multiple species and age ranges to be viable. Therefore, the highest attainable aquatic life use for this stream segment is BWW2.

13 Recreational Use Attainability Analysis - Conclusion

Recommended Highest Attainable Use: Recreational Use	A2
40 CFR 131.10(g)(2) (Flow)	The natural low flow conditions and water levels of the stream segment prevent the attainment of an A1 recreational use (see Site Observations Table). An A1 designation requires the ability for full body immersion. Therefore, the highest attainable recreational use is A2.

14 Flow

Field Work Date	Description
8/18/2006	USGS stream gage data for the area indicated stream flows were normal at the time of assessment.
9/8/2006	USGS stream gage data for the area indicated stream flows were normal at the time of assessment.

Use Attainability Analysis - Data

Site Observations

Use	Site parameter	Site ID #666-1
AL/R	**15 Latitude, Longitude (DD)**	41.09934, -94.29922
AL/R	**16 Average Depth (in)**	0.75
AL/R	**17 Maximum Depth (in)**	10
AL/R	**18 Stream Width (ft)**	1.75
AL/R	**19 Pools Observed?**	Yes
AL only	**20 Non-Game Fish Present and Counts (Species: Number)**	Fathead minnow: 1
	21 Game Fish Present and Counts (Species (Size Range): Number)	Largemouth bass (5" max): 10
	22 Stream Habitat (See also: #29 Site Photos)	All fish except for the fathead minnow found in a single pool near the fenceline (all in good health). Bottom very silty and mucky in the downstream area. Very low flow. Two large meanders-but probably channelized. Duckweed/pondweed present. Fine sediments deposited. Grazed by cattle. Cattle crossings present. Only a couple trees present to provide shade. Some overhanging grass to 1ft.
R only	**23 Evidence of Use for Primary Contact Recreation? (Yes*/No)**	No
	24 Evidence of Use by Children? (Yes*/No)	No
	25 Evidence of Use for Secondary Contact Recreation? (Yes*/No)	Yes
AL/R	**26 Additional Description**	No access and no parking. Fence on the downstream side that crosses through the bottom of the creek. Small amount of crop upstream and forested area.

Use	Site parameter	Site ID #666-1a
AL/R	**15 Latitude, Longitude (DD)**	41.11446, -94.31272
AL/R	**16 Average Depth (in)**	Water present - not measured
AL/R	**17 Maximum Depth (in)**	Water present - not measured
AL/R	**18 Stream Width (ft)**	5
AL/R	**19 Pools Observed?**	Not sampled
AL only	**20 Non-Game Fish Present and Counts (Species: Number)**	None
	21 Game Fish Present and Counts (Species (Size Range): Number)	None
	22 Stream Habitat (See also: #29 Site Photos)	Shallow and low flow. Not very wide. Under bridge is wider. For the most part the same condition as upstream and downstream. Steep banks. Weeds overhanging bank. Looks silty.
R only	**23 Evidence of Use for Primary Contact Recreation? (Yes*/No)**	N/A
	24 Evidence of Use by Children? (Yes*/No)	N/A
	25 Evidence of Use for Secondary Contact Recreation? (Yes*/No)	N/A

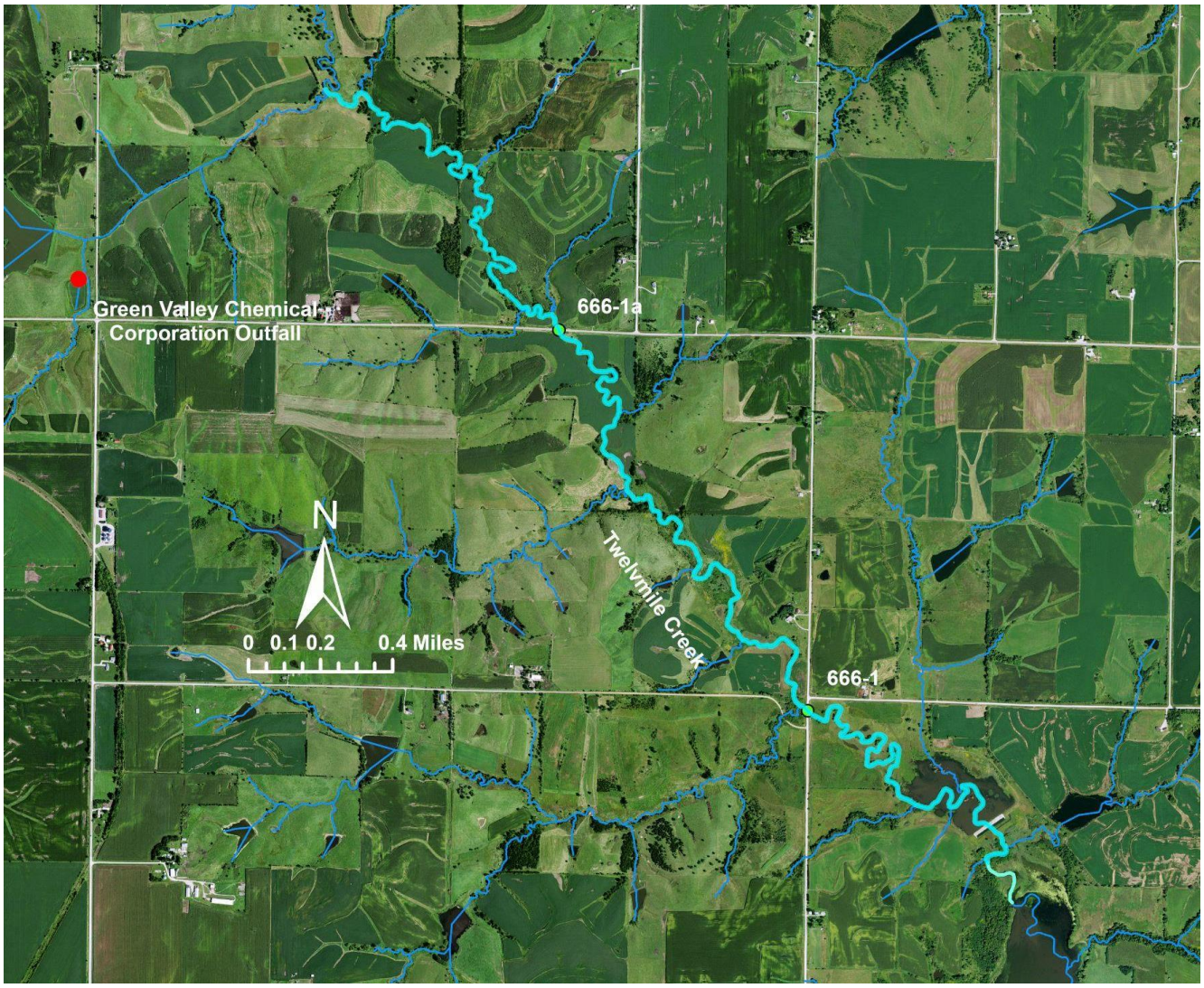
Use	Site parameter	Site ID #666-1a
AL/R	**26 Additional Description**	No recreation taken because so close to other sites.

AL = Aquatic Life
R = Recreation
*If yes, elaborate.

27 Supplemental Data

Desktop review verified that the UAA field work is still valid.

28 Map of Segment, Outfall, and Site(s)



29 Site Photos

Figure 1. 666-1 Bridge view, looking upstream.

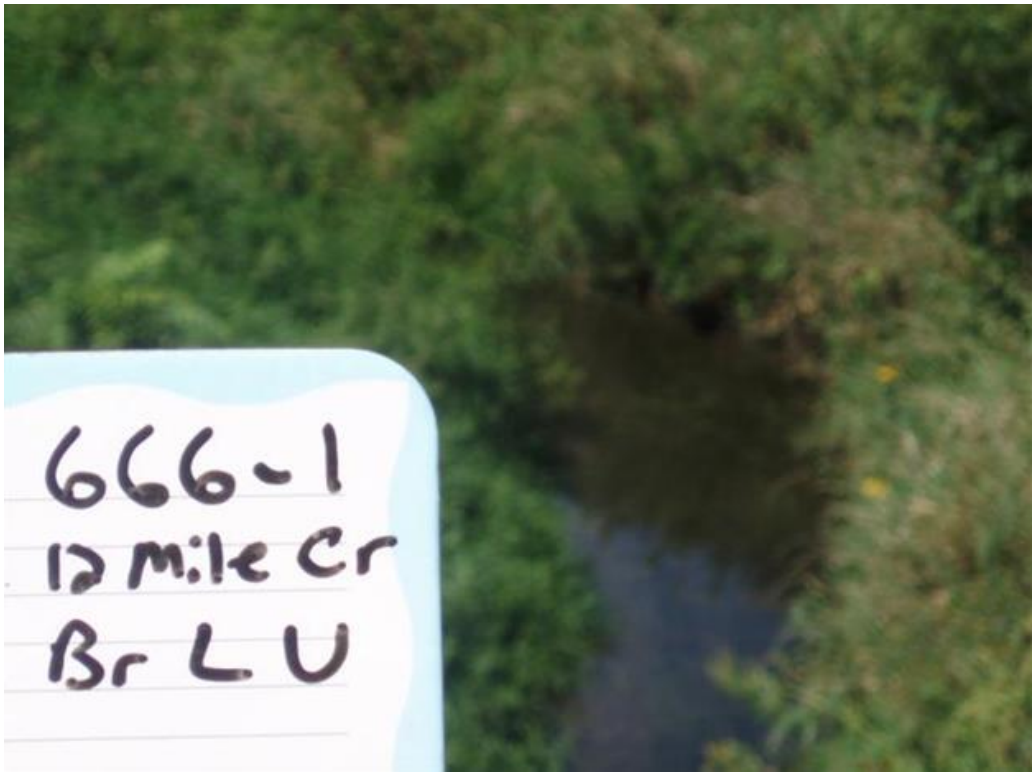


Figure 2. 666-1 Bridge view, looking upstream #2.

Figure 3. 666-1 Bridge view, looking downstream.

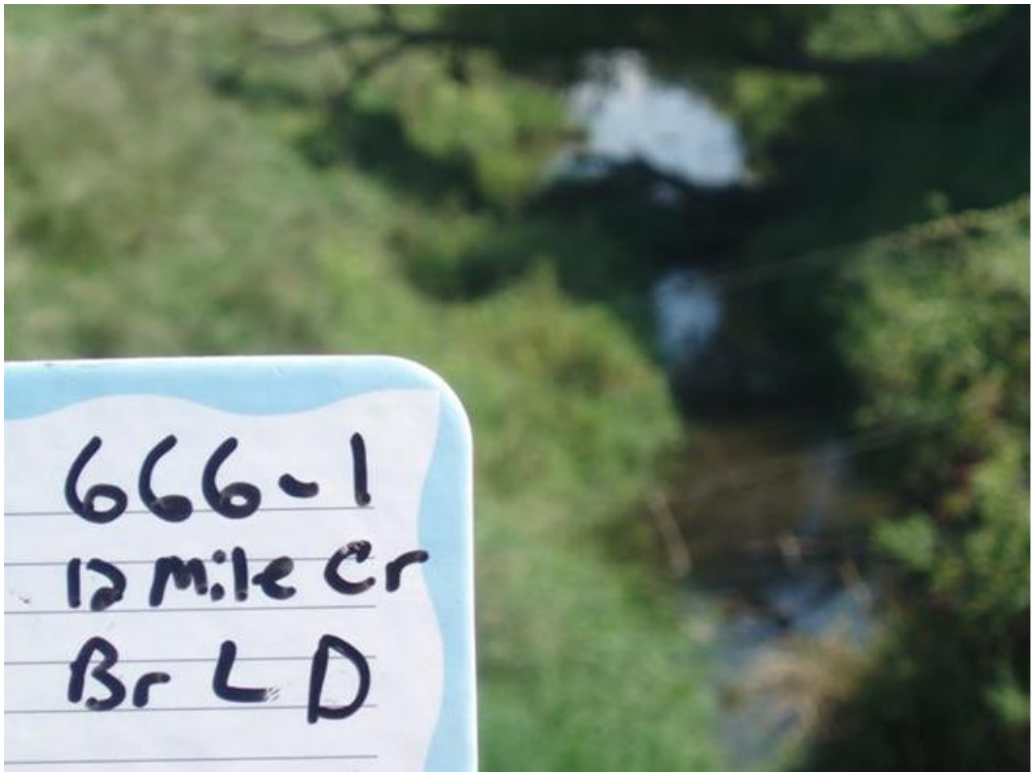


Figure 4. 666-1 Bridge view, looking downstream #2.

Figure 5. 666-1 Start of aquatic assessment, looking upstream.

Figure 6. 666-1 Start of aquatic assessment, looking upstream #2.

Figure 7. 666-1 Start of aquatic assessment, looking downstream.

Figure 8. 666-1 Start of aquatic assessment, looking downstream #2.

Figure 9. 666-1 End of aquatic assessment, looking upstream.

Figure 10. 666-1 End of aquatic assessment, looking upstream #2.

Figure 11. 666-1 End of aquatic assessment, looking downstream.

Figure 12. 666-1 End of aquatic assessment, looking downstream #2.

Figure 13. 666-1 Largemouth Bass.

Figure 14. 666-1 Largemouth Bass #2.

Figure 15. 666-1 Upstream recreational assessment site, looking upstream.

Figure 16. 666-1 Upstream recreational assessment site, looking upstream #2.

Figure 17. 666-1 Upstream recreational assessment site, looking downstream.

Figure 18. 666-1 Upstream recreational assessment site, looking downstream #2.

Figure 19. 666-1 Downstream recreational assessment site, looking upstream.

Figure 20. 666-1 Downstream recreational assessment site, looking upstream #2.

Figure 21. 666-1 Downstream recreational assessment site, looking downstream.

Figure 22. 666-1 Downstream recreational assessment site, looking downstream #2.

Figure 23. 666-1a Bridge view, looking upstream.

Figure 24. 666-1a Bridge view, looking upstream #2.

Figure 25. 666-1a Bridge view, looking downstream.

Figure 26. 666-1a Bridge view, looking downstream #2.

Figure 27. 666-1a Stream view, looking upstream.

Figure 28. 666-1a Stream view, looking downstream.

Appendix I.

c. Stream Flow and Habitat Data

Data analysis results for stream flow and habitat variables were similar to game fish indicator results. Stream width, average thalweg depth, maximum depth, and flow appear to be the characteristics that correlate the best with consistently positive game fish indicators. Stream flow and habitat dimensions (where available) were consistently larger for streams with watershed sizes exceeding 275 square miles. Habitat measurements are not available for the largest sample sites that were sampled by boat instead of the typical wading method.

Ranges of stream size, habitat and flow associated with varying levels of game fish indicator responses are listed in Table 2. These are general statewide values, which may assist in decision making related to the recommendation of warm water aquatic life use designations. In general terms, stream segments that have watershed area, flow and habitat characteristics in the green shaded boxes have a greater probability that game fish indicators will be consistently positive (i.e., consistent with Class B(WW-1)), while stream habitat and flow levels that equate to the red boxes are much less likely to support game fish populations (i.e., Class B(WW-2) or Class B(WW-3)). Stream segments that have a mixture of characteristics, mainly in the yellow range, may require consideration of the additional habitat features collected during the field assessment, to determine the appropriate aquatic life use designation.

Table 2. Generalized statewide ranges of stream habitat indicator levels and associated game fish indicator responses.

Game Fish Indicator Responses	Stream Watershed Area (sq.mi.)	Stream Flow (typical base flow - cfs)	Stream Width Average (ft)	Average Depth (ft)	Avg. Thalweg Depth (ft)	Maximum Depth (ft)
Consistently Positive	>275	>30	>65	>1.2	>2.2	>4.4
Mixed	25-275	0.8-30	11-65	0.2-1.2	0.8-2.2	1.8-4.4
Consistently Negative	<25	<0.8	<11	<0.2	<0.8	<1.8

Iowa uses U.S. EPA's Level IV Ecoregions as a template for wadeable stream biological condition assessment. Stream flow and habitat characteristics can vary from ecoregion to ecoregion. To provide additional insight into where the area of overlap exists between Class B(LR/WW-2) and Class B(WW/WW-1) streams, a query of Iowa's bioassessment database produced 476 habitat assessment records from which a summary of habitat characteristics was prepared (Table 3a-f) (see appendix for full spreadsheet). The summary is grouped by ecoregion and **former** designated uses in order to illustrate the extremes and ranges of overlap in habitat characteristics.